



CODE CHANGES RESOURCE COLLECTION: 2009 IBC[®]

APPROVED CODE CHANGES RESULTING IN THE 2009 IBC[®]



Code Changes Resource Collection: 2009 IBC

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INTRODUCTION

Why did IBC/2009 section [fill-in section number] change from the 2006 edition?@ This resource collection has been compiled to provide the answers to such questions.

This resource collection provides the published documentation for each successful code change in the IBC/2009 since the 2006 edition. Each changed code section is listed in the Table of Changes which contains three headings. The first heading is "2009 IBC" which lists the section number in the 2009 code. If (new) appears after the section number it indicates that the section is new in 2009. If (deleted) is indicated in 2009 it means that the section no longer exists and the second column "2006 IBC@ will show the section number that was deleted. Also, the second heading will indicate if a section number has changed from 2006 to 2009. If there is nothing indicated in the 2006 column, the section number remained the same. The third heading lists the code change number(s) which affected that particular section. The published material for each change is contained in the Documentation section.

HOW TO USE THE RESOURCE COLLECTION

This resource collection makes it possible for the reader to examine, in one location, all published information about a particular code change. For any given change, the text of the proposed change, committee actions and modifications, assembly actions, successful public comments, and final action can be found by using the following steps:

1. Locate the code section in the Table of Changes using the 2009 IBC section number.
2. Note the corresponding proposed code change number(s) from the list.
3. Locate the proposed code change number (listed in numerical order under the appropriate year and letter designation) in the Documentation section to read the complete chronological documentation of the proposed change.

SOURCE DOCUMENTS

The code development cycle (see page vii) involves the publication of four documents, the result of 1) public submittal of proposed changes, 2) a public hearing and committee/assembly actions, 3) submittal of public comments to the committee or assembly actions, and 4) final action results. Under each code change number in the Documentation section of this handbook, material corresponding to that individual proposed change has been drawn from each of the four publications. Two code change cycles occurred between published editions of the 2006 and 2009 IBC; therefore, the Documentation section of this handbook contains material collected from the following published documents:

2006/2007 Documentation

2006/2007 Proposed Changes to the International Codes
2006 Report of the Public Hearing on the International Codes
2007 Final Action Agenda on the International Codes
Final Action on 2006/2007 Proposed Changes to the International Codes

2007/2008 Documentation

2007/2008 Proposed Changes to the International Codes
2008 Report of the Public Hearing on the International Codes
2008 Final Action Agenda on the International Codes
Final Action on 2007/2008 Proposed Changes to the International Codes

Unsuccessful proposed changes have not been included since they do not directly affect the final content of the code section.

RESOURCE COLLECTION FORMAT

Code Change No: FS11-07/08

Code change numbers are identified with a letter and a year designation. For instance, **FS11-07/08** is proposed change number **11** to the International Building Code Fire Safety Committee (FS) and was submitted in the **07/08** (2007/2008) code change cycle. (See *ACode Change Numbers*® on page v for a discussion of code committees)

Original Proposal

This is the proposal as published in the *A2007/2008 Proposed Changes to the International Codes*.® It includes the section number(s), proponent-s name, who they are representing, the text of the proposed change and their reason for the change. This is a change to IBC Section 703.6 - note the term *ASupp*® following the section numbers which means this text is found in the 2007 Accumulative Supplement to the International Codes.

Public Hearing Results

This is the result of the Code Development Hearing held to consider the change, as published in the *A2008 Report of the Public Hearing to the International Codes*.® It includes the committee-s action (disapproved) and reason for the action and also identifies if there was an assembly motion (none).

Public Comments

This is text of the submitted public comment, as published in the A2008 Final Action Agenda to the International Codes®. It includes the public commentor-s name and affiliation, the requested action to be considered at the Final Action Hearing (Approved as Modified) and the reason.

Note: Only those code changes which received a public comment which resulted in a final hearing action different than a committee action are published.

Final Hearing Results

This is the action taken by the eligible voting members of the ICC at the Final Action Hearing, as published in the AFinal Action on 2007/2008 Proposed Changes to the International Codes®. The Final Action was AAMPC2® which means the eligible voting members of ICC overturned the committee-s action and approved the change based on the submitted public comment.

CODE CHANGE NUMBERS

The following is the legend for code change numbers, along with the applicable committee and the committee-s primary area of responsibility relative to the IBC.

Prefix	Code Committee	Primary IBC Chapters Affected
E	IBC Means of Egress Committee	Chapters 10, 11
F	IFC Committee	Chapters 3, 4, 8, 9, 27
FS	IBC Fire Safety Committee	Chapters 7, 8, 9, 14, 26
G	IBC General Committee	Chapters 1-6, 12, 13, 27-34
EB	IEBC Code Committee	Chapter 34
P	IPC Code Committee	Chapter 29
RB	IRC Building/Energy Committee	Chapters 14, 25, 31
S	IBC Structural Committee	Chapters 15-25

Although most changes to the IBC are found under proposed change numbers beginning with an E, FS, G, or S, some changes to the IBC are published within a proposed change to the other *International Codes*, and therefore are found under a proposed code change number beginning with one of the other letters listed above. Use the table of contents to locate appropriate sections by year and letter designation.

CODE SECTION NUMBER DIFFERENCES

For editorial reasons, some code section numbers in the 2009 edition have changed from the 2006 edition. The numbering of code sections is an editorial task which takes place outside of the normal code development cycle, and is necessary to avoid duplicate or nonsequential section numbers.

The Table of Changes typically references the 2006 code section numbers that have been deleted. (See Introduction)

In most cases the section numbers have not changed from the 2006 to the 2009 edition. However, the reader should remember that it is always the 2006 code section numbers (or in rare cases, a different number corresponding to a 2007 Supplement numbering change) which appear in the material contained in the Documentation section. This is due to proposed changes which have as their basis, a section number in the 2006 edition. Since an attempt to correlate code sections by number may lead to confusion, the user is advised to rely on the section content rather than the numbers to locate and compare parallel sections in the two editions.

ABBREVIATIONS FOR ACTIONS

In the Documentation section, the following abbreviations are used to signify committee or final action:

Legend for 2006/2007 and 2007/2008 Documentation:

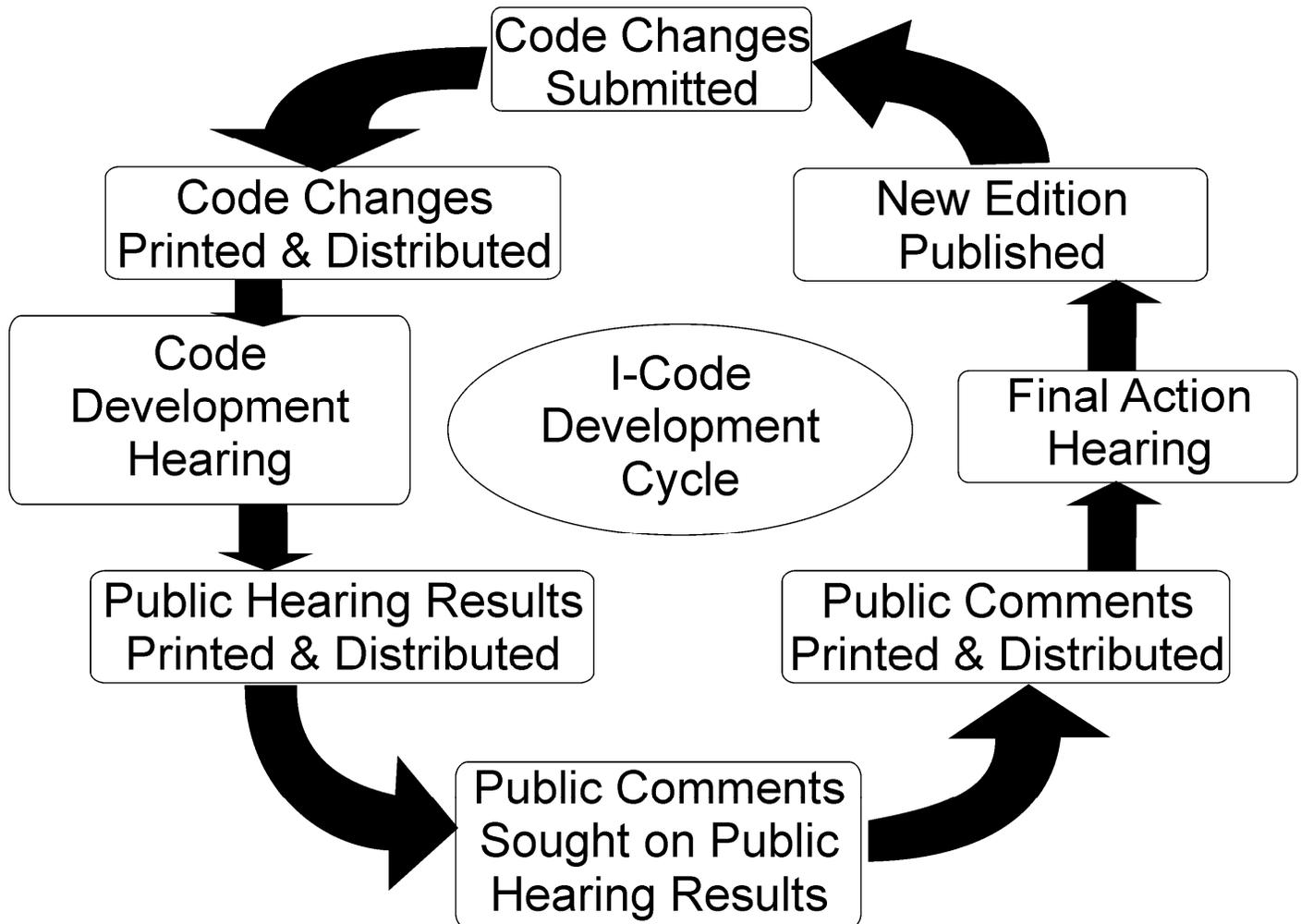
AS	=	Approved as Submitted
D	=	Disapproved
AM	=	Approved as Modified by the Code Committee
AMPC	=	Approved as Modified by a Public Comment
WP	=	Withdrawn by Proponent

CODE CORRELATION COMMITTEE

During the course of the code development process, there are editorial issues, issues related to code correlation problems arising from code changes, and issues related to the appropriate committee that should consider certain topics. These issues are placed before the ICC Code Correlation Committee for resolution. During the development of the 2009 Code, from 2006 to 2009, the Code Correlation Committee met 3 times to discuss and resolve these issues. The parts of the code that were affected by a Code Correlation Committee action are indicated with the letters ACCC® beside that section of the code. All Code Correlation Committee actions are listed at the end of this handbook.

ICC CODE DEVELOPMENT PROCESS

The following depicts the key steps in ICC's Code Development Process:



The procedures governing ICC Code Development are entitled ACode Development Process for the International Codes®. These procedures are updated periodically and therefore not included here. To obtain the current version, visit ICC's website at www.iccsafe.org.

TABLE OF CHANGES

CHAPTER 1 ADMINISTRATION

2009 IBC	2006 IBC	CODE CHANGE NUMBER(S)
Chapter 1 Title		G221-06/07
Part I (New) (Sections 101-102		G221-06/07
101.2		CCC
Deleted..... 101.4.1		CCC
Part II (New) (Sections 103-115)		G221-06/07
106.1	1603.3	S48-07/08, CCC
106.2	1603.4	S48-07/08, CCC
106.3	1603.2	S48-07/08, CCC
107	106	G222-06/07
107.1	106.1	G222-06/07, G6-07/08
107.2 (New)		G222-06/07
106.2.1	106.1.1	G222-06/07
107.2.5.1 (New)		S22-06/07
107.3		CCC
110.3.6	109.3.6	G10-07/08
111.1	110.1	G25-06/07
112.3	111.3	G26-06/07
113.1	112.1	G4-06/07

CHAPTER 2 DEFINITIONS

2009 IBC DEFINITIONS	CODE CHANGE NUMBER(S)
Aggregate (New)	FS185-06/07
Ambulatory Health Care Facility (New).....	G23-07/08
Automatic Smoke Detection System (New)	F163-07/08
Area (for masonry).....	G121-07/08
Awning.....	G30-06/07
Ballast (New)	FS186-06/07, S2-07/08
Basement (for other than flood loads)	G13-07/08
Basement (for flood loads) (New)	G13-07/08
Bearing Wall Structure (New)	S101-07/08
Building Element (New)	FS4-06/07
Cell (New).....	G86-07/08
Cell Tier (New).....	G86-07/08
Child Care Facilities.....	G30-07/08, CCC
Clinic-Outpatient	G24-07/08
Covered Mall Building.....	G38-07/08
Dangerous (New)	G205-07/08

CHAPTER 2 (continued)

2009 IBC DEFINITIONS	CODE CHANGE NUMBER(S)
Deep Foundation (New).....	S160-07/08
Detoxification Facility	G30-07/08, CCC
Drilled Shaft (New).....	S160-07/08
Socketed drilled shaft (New).....	S160-07/08
Elevator Group	F83-06/07
Exit Access Doorway (New)	E110-07/08
Exterior Insulation and Finish Systems (EIFS) (New)	FS175-07/08
Exterior Insulation and Finish Systems (EIFS) With Drainage (New)	FS175-07/08
Fiber Reinforced Polymer (New)	FS196-07/08
Fiberglass Reinforced Polymer (New)	FS196-07/08
Fire Area.....	FS7-06/07 G9-06/07
Fixed Base Operator (FBO) (New)	G25-07/08
Flight (New)	E6-06/07
Frame Structure (New)	S101-07/08
Hazardous Production Material (HPM)	F219-07/08
Helical Pile (New)	S171-07/08
High-Rise Building (New).....	G14-07/08
Hospitals and Mental Hospitals.....	G30-07/08, CCC
Housing Unit (New).....	G86-07/08
Inert Gas (New)	F36-07/08
Interior Floor-Wall Base (New)	F65-06/07
Intumescent Fire Resistant Coatings (New)	S102-07/08
Label.....	S29-06/07
Labeled (New)	G16-07/08
Light-frame Construction	S155-07/08, CCC
Listed (New)	G17-07/08
Mall	G38-07/08
Manufacturer's Designation	S29-06/07
Mark.....	S29-06/07
Mastic Fire Resistant Coatings (New).....	S102-07/08
Microphiles (New).....	S260-07/08
Nursing Homes.....	G30-07/08, CCC
Open Mall	G38-07/08
Open Mall Building (New)	G38-07/08
Oxidizer	F291-07/08
Photoluminescent (New).....	E144-07/08
Primary Structural Frame (New)	FS115-07/08
Reflective Plastic Core Foil Insulation (New)	FS149-07/08
Registered Design Professional In Responsible Charge (New).....	G33-06/07

CHAPTER 2 (continued)

2009 IBC DEFINITIONS	CODE CHANGE NUMBER(S)
Residential Aircraft Hangar.....	G81-06/07
Sallyport (New).....	G83-07/08
Secondary Members (New).....	FS115-07/08
Self-luminous (New).....	E144-07/08
Shallow Foundation (New).....	S160-07/08
Site-Fabricated Stretch System (New).....	FS167-07/08
Special Structural Wall (New).....	S172-07/08
Storm Shelter (New).....	G109-07/08
Story.....	G8-06/07
Story Above Grade Plane.....	G8-06/07
Substantial Structural Damage (New).....	G206-07/08
Suite (New).....	E95-07/08
Sunroom.....	G178-07/08
Tent.....	G36-06/07, F243-07/08
Transient Aircraft.....	G25-07/08
Vapor Retarder Class.....	EC28-06/07
Zone Notification.....	F84-06/07

For deleted or relocated definitions see the following code changes: G33-06/07, G98-06/07, S9-06/07, S65-06/07, EC28-06/07, F224-06/07, CCC, FS196-07/08, S160-07/08, S175-07/08, S184-07/08

**CHAPTER 3
USE AND OCCUPANCY CLASSIFICATION**

2009 IBC	2006 IBC	CODE CHANGE NUMBER(S)
303.1.....		G137-06/07
304.1.....		G23-07/08
304.1.1 (New).....		G23-07/08
306.2.....		G25-07/08 G26-07/08
306.3.....		G26-07/08
307.1.....		F218-06/07, G28-07/08, CCC
Table 307.1(1).....		F46-06/07, F168-06/07, F169-06/07, F247-07/08, CCC
Table 307.1(2).....		F168-06/07, F169-06/07
307.2.....		F208-06/07, F224-06/07, F245-07/08, F291-07/08
308.3.....		G30-07/08, CCC
308.3.1.....		G30-07/08, CCC

CHAPTER 3 (continued)

2009 IBC	2006 IBC	CODE CHANGE NUMBER(S)
308.5.1.....		G46-06/07, G32-07/08
308.5.2.....		E10-07/08
309.1.....		CCC
310.1.....		G47-06/07, G92-06/07, G36-07/08
311.2.....		G25-07/08
311.3.....		G25-07/08, G26-07/08

**CHAPTER 4
SPECIAL DETAILED REQUIREMENTS
BASED ON USE AND OCCUPANCY**

2009 IBC	2006 IBC	CODE CHANGE NUMBER(S)
402.2.....		G38-07/08
402.4.1.1.....		G39-07/08
402.4.6.....		FS37-06/07
402.5.2 (New).....		G38-07/08
402.6.....		G6-06/07
402.6.1 (New).....		G52-06/07
402.7.1.....		FS37-06/07
402.8 (New).....		G53-06/07
402.10.....	402.9.....	G54-06/07 G38-07/08, CCC
402.11.....	402.10.....	FS11-06/07
402.12.1.....	402.11.1.....	G56-06/07
402.16.4.....	402.15.4.....	FS11-06/07
403.1.....		G14-07/08 G44-07/08
403.2 (New).....		CCC
403.2.1.....	403.3.....	CCC
403.2.1.1.....	403.3.1.....	G60-06/07 201), G48-07/08, CCC
403.2.1.2.....	403.3.2.....	G48-07/08, G50-07/08, CCC
403.2.2.....	403.14.....	CCC
403.2.3 (New).....		G65-07/08, CCC
403.2.3.1 (New).....		G65-07/08
403.2.3.2 (New).....		G65-07/08
403.2.3.3 (New).....		G65-07/08
403.2.3.4 (New).....		G65-07/08, CCC
403.2.4 (New).....		G68-06/07, G68-07/08
Table 403.2.4 (New).....		G68-06/07, CCC
403.3.....	403.2.....	FS37-06/07
403.3.1 (New).....		G46-07/08, CCC
403.3.1.1 (New).....		G46-07/08

CHAPTER 4 (continued)

CHAPTER 4 (continued)

2009 IBC	2006 IBC	CODE CHANGE NUMBER(S)
403.3.2 (New)		G46-07/08, CCC
403.4 (New)		CCC
403.4.2 (New)		CCC
403.4.4	403.7	G53-07/08
403.4.6 (New)		G64-07/08
403.4.7.2	403.10.2	F89-07/08, CCC
403.4.8.1	403.11.1	F89-07/08
403.5 (New)		CCC
403.5.1 (New)		G61-07/08
403.5.2 (New)		G71-06/07, E14-07/08, CCC
403.5.3	403.12	CCC
403.5.3.1	403.12.1	CCC
403.5.4	403.13	CCC
403.5.5 (New)		E84-06/07, E146-07/08
403.5.6	403.4	CCC
404.3		FS37-06/07
404.4 (New)		CCC
404.6	404.5	G74-07/08
404.9	404.8	G75-07/08, CCC
405.1		G77-06/07, E8-07/08
405.4.1		E8-07/08
Deleted	405.7	CCC
405.7.2	405.8.2	E8-07/08, CCC
406.1.5 (New)		G80-06/07
406.2.3		G76-07/08
406.2.4		G76-07/08, G77-07/08
406.2.6		G78-06/07
406.3.3		G76-07/08, S66-07/08
406.3.6		G81-06/07, G80-07/08
406.5.2 (New)		F156-06/07, F233-07/08
406.5.3	406.5.2	FS11-06/07
407.2.1		G131-06/07, CCC
407.2.3		G131-06/07, CCC
407.4.3 (New)		FS81-07/08
407.6 (New)		CCC
407.9 (New)		G82-07/08
408.1.1 (New)		G83-07/08, G86-07/08
408.2		G84-06/07, G84-07/08
408.3.5 (New)		E74-07/08
408.3.7 (New)		G85-07/08, CCC
408.4		CCC
408.5		G86-07/08

2009 IBC	2006 IBC	CODE CHANGE NUMBER(S)
408.5.1 (New)		G86-07/08, CCC
408.5.2 (New)		G87-07/08, CCC
408.6		G88-07/08
408.7 (New)		G88-07/08
408.8	408.7	G89-07/08
408.10 (New)		CCC
410.3.5		G86-06/07, G87-06/07
Deleted	410.3.5.1	G87-06/07
Deleted	410.3.5.2	G87-06/07
Deleted	410.3.5.3	G87-06/07
Deleted	410.3.5.4	G87-06/07
Deleted	410.3.5.4	G87-06/07
410.4		FS20-07/08
410.5.1		FS37-06/07
410.5.2		FS37-06/07
410.5.3		CCC
411.7		G89-06/07, G92-07/08
411.7.1 (New)		G92-07/08
412.1 (New)		F225-07/08
412.2 (New)	412.3.1 & 412.5.1	G81-06/07, G25-07/08, CCC
412.3.3	412.2.2	G13-07/08
412.3.5	412.2.4	G93-07/08
412.3.7	412.2.6	G25-07/08
412.3.7.1 (New)		G25-07/08
Table 412.3.7.1 (New)		G25-07/08
412.3.7.2 (New)		G25-07/08
412.4.1	412.3.1	G81-06/07, G25-07/08
412.4.6	412.3.6	G81-06/07
Deleted	412.5.1	CCC
412.7.3	412.5.4	G94-07/08
414.1.3		F223-06/07, CCC
414.2.4		G6-06/07, FS20-07/08
414.5.4		F171-06/07
415.2		F224-06/07, F219-07/08
415.3.2		F224-06/07
415.4		G13-07/08
415.5.4		F171-06/07, F254-07/08, CCC
415.6.1.2		FS37-06/07
415.6.1.6		G81-06/07
415.6.2		G98-07/08
415.6.2.1		G9-06/07
415.6.2.1.1		G8-06/07
415.6.2.2		FS37-06/07
415.6.3		G100-07/08

CODE CHANGES RESOURCE COLLECTION - INTERNATIONAL BUILDING CODE

CHAPTER 4 (continued)

2009 IBC	2006 IBC	CODE CHANGE NUMBER(S)
Deleted	415.6.3.1	G100-07/08
Deleted	415.6.3.2	G100-07/08
Deleted	415.6.3.3 through 415.6.3.3.3	G100-07/08
Deleted	415.6.3.4	G100-07/08
Deleted	415.6.3.4.1	FS37-06/07, F232-06/07, G100-07/08
Deleted	415.6.3.5	G100-07/08
Deleted	415.6.3.5.1	G100-07/08
Deleted	415.6.3.5.2	FS37-06/07, G100-07/08
415.7.1 (New)		G98-07/08
415.7.2	415.7.1	FS37-06/07
415.8.2.2		FS37-06/07
415.8.2.8.1		CCC
415.8.5.2.1		FS37-06/07
415.8.5.2.2		FS37-06/07
415.8.7.2		F147-06/07
416.2		FS37-06/07
416.4 (New)		F225-06/07
418.4		FS37-06/07
418.5		FS37-06/07
418.6		FS37-06/07
419 (New)		G92-06/07
419.2 (New)		G92-06/07, G103-07/08, G104-07/08
419.3.1 (New)		CCC
420.2	419.2	FS66-06/07, G104-07/08
420.3	419.3	FS66-06/07, G104-07/08
420.4	419.3	FS66-06/07, G104-07/08
422 (New)		G23-07-08
423 (New)		G109-07/08

CHAPTER 5

GENERAL BUILDING HEIGHTS AND AREAS

2009 IBC	2006 IBC	CODE CHANGE NUMBER(S)
Chapter 5 title		G81-06/07, G122-07/08
501.2		F40-06/07
502.1		G8-06/07, G98-06/07, G13-07/08, G112-07/08

CHAPTER 5 (continued)

2009 IBC	2006 IBC	CODE CHANGE NUMBER(S)
503.1		G110-06/07, G122-07/08
Table 503.1		G115-07/08, G117-07/08, G119-07/08, G120-07/08, G121-07/08, G122-07/08
503.1.1		G122-07/08
503.1.2		G121-07/08, G122-07/08
503.1.3		G122-07/08
504.1		G122-07/08
504.2		G9-06/07, G121-07/08, G122-07/08
504.3		G122-07/08
505.1		G128-07/08
505.4		G8-06/07, G129-07/08, CCC
505.5		G9-06/07, G130-07/08
506 Section Title		G121-07/08
506.1		G121-07/08
506.2.1		G223-06/07
506.3		G223-06/07
506.2		G121-07/08
506.2.1		G223-06/07, G132-07/08
506.3		G223-06/07, G121-07/08
506.4 (New)	506.1.1 (Exception)	G8-06/07, G125-06/07, G135-07/08
506.4.1	506.4	G125-06/07, G121-07/08, G135-07/08
Deleted	506.4.1.1	G125-06/07, G135-07/08
506.5 (New)		G135-07/08
506.5.1 (New)		G135-07/08
506.5.2 (New)		G135-07/08
507.2		G8-06/07
507.3		G8-06/07, G223-06/07, G142-07/08, G144-07/08
507.3.1 (New)		G144-07/08
507.4		G8-06/07
507.5		G146-07/08

CHAPTER 5 (continued)

CHAPTER 5 (continued)

2009 IBC	2006 IBC	CODE CHANGE NUMBER(S)
507.6		G8-06/07, G147-07/08
507.7 (New)		G147-07/08
507.8	507.7	G8-06/07, G9-06/07
507.9	507.8	G8-06/07, G48-07/08, G150-07/08
507.10	507.9	G8-06/07
507.11	507.10	G8-06/07
508 (Reorganization)		G149-06/07
508.1		G134-06/07 G149-06/07
508.2	508.2, 508.3.1	G137-06/07, G149-06/07
Deleted	508.2.1	G149-06/07
Deleted	508.3	G149-06/07
508.2.1	508.3.1	G134-06/07, G149-06/07, G121-07/08
508.2.2	508.3.1.1	G149-06/07
508.2.3	508.3.1.2	G134-06/07, G149-06/07, G121-07/08
508.2.4	508.3.1.3	G134-06/07, G140-06/07, G149-06/07, G104-07/08
508.2.5	508.2.2	G131-06/07, G149-06/07
Table 508.2.5	Table 508.2	G133-06/07, G149-06/07, G153-07/08, G154-07/08, G155-07/08
508.2.5.1	508.2.2.1	G131-06/07, G134-06/07, G149-06/07, G156-07/08
508.2.5.2	508.2.2.1	FS40-06/07, G149-06/07, G157-07/08
508.2.5.3	508.2.3	G131-06/07, G149-06/07, G155-07/08
508.3	508.3.2	G134-06/07
508.3.1	508.3.2.1	G134-06/07
508.3.2	508.3.2.2	G121-07/08

2009 IBC	2006 IBC	CODE CHANGE NUMBER(S)
508.3.3	508.3.2.3	G134-06/07, G140-06/07, G104-07/08
508.4	508.3.3	G134-06/07
Table 508.4	Table 508.3.3	G145-06/07, G160-07/08, G161-07/08, G162-07/08, G163-07/08
508.4.1	508.3.3.1	G134-06/07
508.4.2	508.3.3.2	G134-06/07, G121-07/08
508.4.3	508.3.3.3	G134-06/07, G142-06/07, G122-07/08
509.1		G151-06/07
509.2		G153-06/07, G154-06/07, G155-06/07
509.3		G8-06/07, G153-06/07
509.5		G156-06/07, FS20-07/08
509.6		G156-06/07, FS20-07/08
509.8		G8-06/07, G157-06/07
509.9 (New)		G158-06/07, G167-07/08, G168-07/08

CHAPTER 6
TYPES OF CONSTRUCTION

2009 IBC	2006 IBC	CODE CHANGE NUMBER(S)
Table 601		FS98-06/07, G160-06/07, FS115-07/08
602.1		FS4-06/07
Table 602		G172-07/08
602.4.7		FS155-07/08
603.1		G6-06/07, G168-06/07, G169-06/07, Editorial reformat of numbering
603.1.3		CCC

CODE CHANGES RESOURCE COLLECTION - INTERNATIONAL BUILDING CODE

CHAPTER 7

FIRE AND SMOKE PROTECTION FEATURES

CHAPTER 7 (continued)

2009 IBC	2006 IBC	CODE CHANGE NUMBER(S)	2009 IBC	2006 IBC	CODE CHANGE NUMBER(S)
Chapter title		FS160-07/08	705.8.2.....	704.8.2	FS24-06/07, FS1-07/08, FS118-07/08
701.1		FS1-06/08	705.8.3 (New)		FS24-06/07 29), FS118-07/08
702.1		FS4-06/07, FS7-06/07, FS8-06/07, G9-06/07, FS1-07/08, FS4-07/08	705.8.4 (New)		FS24-06/07, FS118-07/08
703.2		FS9-06/07, FS10-06/07	705.8.5.....	704.9	FS10-06/07, FS24-06/07, G6-06/07, FS118-07/08,
703.2.1		FS10-06/07	705.8.6.....	704.10	FS24-06/07, FS25-06/07, FS20-07/08
703.2.3		FS10-07/08	705.9.....	704.13	FS24-06/07
703.3		FS9-06/07, FS10-06/07	705.9.1.....	704.13.1	FS24-06/07
703.4.2		FS11-06/07	705.10.....	704.14	FS24-06/07
703.5	706.2.1	FS10-06/07, FS36-06/07	Deleted	704.12	FS24-06/07
703.6 (New)		FS14-06/07, FS10-07/08, FS11-07/08	Deleted	704.12.1	FS24-06/07
704	714	FS118-07/08	706.....	705	FS118-07/08
704.1	714.1	FS69-06/07, FS98-06/07, FS115-07/08	706.1.1.....	705.1.1	FS22-07/08, FS118-07/08
Deleted.....	714.2	FS98-06/07	Table 706.4.....	Table 705.4	FS26-07/08, FS118-07/08
704.2	714.4	FS98-06/07, FS115-07/08	706.5.1.....	705.5.1	FS29-06/07, FS31-06/07
704.3	714.2	FS98-06/07, FS115-07/08	706.6.....	705.6	FS32-06/07, FS29-07/08
704.4	714.2.1	FS98-06/07, FS115-07/08	706.8.....	705.8	FS33-06/07
704.4.1	714.3	FS98-06/07, FS115-07/08	706.11.....	705.11	FS34-06/07
704.9	714.4	FS116-07/08	707.....	706	FS118-07/08
704.11	714.6	FS115-07/08	707.3.3.....	706.3.3	FS37-06/07
704.12	714.7	FS10-06/07	707.3.6.....	706.3.6	G131-06/07
704.13 through			707.3.8.....	706.3.8	G131-06/07
704.13.5 (New)		FS100-06/07	707.3.9.....	706.3.9	FS37-06/07, FS34-07/08
705	704	FS118-07/08	Table 707.3.9.....	Table 706.3.9	FS118-07/08
705.2	704.2	FS14-07/08	707.5.....	706.5	FS40-06/07, G131-06/07, FS35-07/08, FS37-07/08, G156-07/08
705.5	704.5	FS16-07/08	707.5.1 (New)		FS35-07/08, FS37-07/08
705.7	704.7	FS10-06/07, FS118-07/08	707.6.....	706.7	FS10-06/07, FS42-06/07, FS43-06/07, G9-06/07, E130-07/08
705.8 (New)		FS24-06/07	707.8.....	706.9	FS37-07/08
Table 705.8 (New)		FS22-06/07, FS24-06/07, FS118-07/08,			
705.8.1	704.8	FS24-06/07, FS115-07/08			

CHAPTER 7 (continued)

CHAPTER 7 (continued)

2009 IBC	2006 IBC	CODE CHANGE NUMBER(S)	2009 IBC	2006 IBC	CODE CHANGE NUMBER(S)
708	707	FS118-07/08	713.1.1	712.3.3	FS46-06/07
708.1	707.1	FS38-07/08	713.3	712.3	FS37-06/07, FS77-06/07
708.2	707.2	FS48-06/07, CCC, FS40-07/08, FS41-07/08	713.3.1	712.3.1	FS10-06/07
708.4	707.4	FS43-07/08	713.3.2	712.3.2	FS82-06/07, FS85-06/07, FS89-07/08, FS90-07/08
708.11	707.11	FS37-06/07	713.4	712.4	FS75-06/07, FS86-06/07, CCC
708.13.3	707.13.3	FS37-06/07	713.4.1	712.4.1	FS77-06/07
708.13.4	707.13.4	FS37-06/07	713.4.1.1	712.4.1.1	FS10-06/07
708.14.1	707.14.1	FS52-06/07, FS49-07/08, FS53-07/08, FS56-07/08, FS58-07/08, G14-07/08	713.4.1.1.2	712.4.1.1.2	FS95-07/08
708.14.1.1 (New)		FS60-07/08	713.4.1.2	712.4.1.2	FS89-06/07, FS90-06/07, FS80-07/08
708.14.2.1	707.14.2.1	FS55-06/07, FS56-06/07, FS67-07/08	713.4.2	712.4.2	FS91-06/07
708.14.2.2 (New)		FS67-07/08	713.4.2.1	712.4.2.1	FS97-07/08
708.14.2.7 through 708.14.2.10 (New)		FS67-07/08	713.5	712.5	FS99-07/08
708.14.2.3.3	707.14.2.3.3	FS60-06/07	714	713	FS118-07/08
708.14.3.5	707.14.2.5	FS68-07/08	714.1	713.1	FS10-06/07, FS102-07/08, FS103-07/08
708.14.3.6 (New)		FS69-07/08, FS118-07/08	714.4	713.4	FS10-06/07, FS110-07/08
709	708	FS118-07/08	714.4.1 (New)		FS111-07/08
709.1	708.1	FS66-06/07	714.6	713.6	FS112-07/08
709.3	708.3	FS68-06/07, E159-07/08	715.2		FS10-06/07, FS101-06/07
709.4	708.4	FS69-06/07 G6-06/07, CCC	715.3		FS102-06/07
710	709	FS118-07/08	715.4		FS120-07/08
710.5	709.5	FS75-07/08, FS76-07/08	715.4.1		FS105-06/07
711	710	FS118-07/08	715.4.2		FS105-06/07
711.5.2	710.5.2	FS77-07/08, FS118-07/08	715.4.3		FS121-07/08
712	711	FS118-07/08	715.4.3.1		FS106-06/07
712.1	711.1	FS75-06/07	715.4.3.2		FS102-06/07
712.3	711.3	FS66-06/07	715.4.4		FS108-06/07
712.3.2	711.3.2	FS10-06/07	715.4.4.1		FS105-06/07, FS108-06/07
712.3.3	711.3.3	FS20-07/08	715.4.5 (New)		FS120-07/08
712.4	711.4	FS69-06/07, FS20-07/08	715.4.6.1	715.4.5.1	FS110-06/07, FS120-07/08
712.5	711.5	FS80-07/08	715.4.7.1	715.4.6.1	FS112-06/07, FS113-06/07, FS120-07/08
712.6	711.6	FS80-07/08	715.4.7.3.1	715.4.6.3.1	FS116-06/07, FS120-07/08
712.9 (New)		FS81-07/08	715.4.7.4	715.4.6.4	FS118-06/07, FS120-07/08
713	712	FS118-07/08	715.5		FS102-06/07
			Table 715.5		FS124-06/07

CHAPTER 7 (continued)

CHAPTER 7 (continued)

2009 IBC	2006 IBC	CODE CHANGE NUMBER(S)
715.5.1		FS102-06/07
715.5.2		FS102-06/07
715.5.3 (New)		FS118-06/07
715.5.8.1	715.5.7.1	FS136-07/08
715.5.8.2	715.5.7.2	FS136-07/08
715.5.9.1	715.5.8.1	FS102-06/07, FS129-06/07
716.1.1		FS46-06/07
716.1.1.1 (New)		FS46-06/07
716.2.1		FS137-07/08
716.3		FS139-07/08
716.3.1	716.3 (portion)	FS139-07/08
716.3.2	716.3.1.2	FS139-07/08
716.3.2.1	716.3.1.2 (portion)	FS139-07/08
716.3.2.2 (New)		FS139-07/08
716.3.2.3 (New)		FS139-07/08
716.3.3	716.3.1.1	FS139-07/08
716.3.3.1	716.3.1.1	FS139-07/08
716.3.3.2	716.3.2.1	FS130-06/07, FS139-07/08
Deleted	716.3.2	FS139-07/08
716.3.3.3 (New)		FS139-07/08
716.3.3.4 (New)		FS139-07/08
716.5		FS140-06/07, FS141-07/08
716.5.1.1 (New)		E146-06/07, CCC
716.5.2		FS10-06/07
716.5.2.1 (New)		E146-06/07, CCC
716.5.3		FS10-06/07, FS135-06/07, M16-07/08
716.5.4		FS43-06/07, FS145-07/08, M16-07/08
716.5.6 (New)		FS139-06/07
716.5.7 (New)		FS140-06/07
716.6.1		FS10-06/07, M16-07/08
716.6.2.1		FS10-06/07, FS143-06/07, FS139-07/08
717.2.1		FS145-06/07, FS146-06/07
717.2.1.1 (New)		FS146-06/07
717.2.1.2 (New)		FS146-06/07
717.2.1.3 (New)		FS146-06/07
717.2.1.4	717.2.1 (portion)	FS146-06/07
717.2.5		FS147-07/08
717.2.5.1 (New)		FS147-07/08

2009 IBC	2006 IBC	CODE CHANGE NUMBER(S)
717.4.2		G6-06/07
719.1		FS11-06/07, FS149-07/08
719.2.1		FS149-07/08
719.4		FS11-06/07, FS148-06/07
720.1		FS9-06/07
Table 720.1(1)		FS10-06/07
Table 720.1(2)		FS149-06/07, FS150-06/07, FS151-06/07, FS152-06/07
Table 720.1(3)		FS153-07/08
721.1		FS153-06/07
Table 721.2.1.4(1)		FS156-07/08, FS157-07/08
721.2.1.4.3		FS155-07/08
721.2.4.1		FS154-07/08
721.2.4.1.1 (New)		FS154-07/08
721.2.4.1.2 (New)		FS154-07/08
721.2.4.2		FS154-07/08
721.2.4.3 (New)		FS154-07/08
721.3.1.1		FS158-07/08
Table 721.3.2		FS158-07/08
721.3.2.3		FS155-07/08
721.4.1.1.1		FS154-06/07
721.4.1.4		FS155-07/08
Figure 721.5.1(5)		FS156-06/07
721.5.1.3		FS156-06/07
721.5.1.3.2		FS156-06/07
721.5.2.2		FS156-06/07
721.5.2.3		FS156-06/07, FS20-07/08
721.6.1.1		FS153-06/07
721.6.2.3		FS155-07/08
Table 721.6.2(3)		FS159-07/08

**CHAPTER 8
INTERIOR FINISHES**

2009 IBC	2006 IBC	CODE CHANGE NUMBER(S)
Deleted	801.1.1	FS160-06/07
801.2 (New)		FS160-06/07
801.3 (New)		FS160-06/07
801.8	801.2.2	FS160-06/07
802.1		FS11-06/07, F65-06/07
803.1 (New)		FS160-06/07

CHAPTER 8 (continued)

CHAPTER 9 (continued)

2009 IBC	2006 IBC	CODE CHANGE NUMBER(S)
803.1.1	803.1	FS11-06/07, FS157-06/07, FS160-06/07
803.1.2	803.2	FS157-06/07, FS158-06/07, FS160-06/07
803.1.2.1	803.2.1	FS160-06/07
803.1.3 (New)		FS160-06/07
803.1.3.1 (New)		FS160-06/07
803.1.4 (New)		FS160-06/07, FS163-07/08, FS164-07/08
803.2 through 803.8 (New)		FS160-06/07
Deleted	803.6	FS160-06/07
Deleted	803.6.1	FS11-06/07, FS160-06/07
Deleted	803.6.2	FS160-06/07
Deleted	803.6.2.1	FS160-06/07
Deleted	803.6.3	FS160-06/07
Deleted	803.7	FS160-06/07
803.9	803.5	FS11-06/07, FS157-06/07, FS160-06/07
Table 803.9	Table 803.5	FS160-06/07, G6-06/07, FS163-07/08, F116-07/08
803.11	803.4	FS160-06/07
803.11.1	803.4.1	FS160-06/07
803.11.2	803.4.2	FS160-06/07, FS163-07/08
803.11.3	803.4.3	FS160-06/07
803.11.4	803.4.4	FS160-06/07, FS168-07/08,
803.12 (New)		FS165-07/08,
803.13 (New)		FS167-07/08,
804.4.1		FS169-07/08,
805.1.1		FS20-07/08,
805.1.2		FS20-07/08,
806.5		FS11-06/07, F120-07/08
806.6 (New)		F65-06/07
807	803.8	FS160-06/07

2009 IBC	2006 IBC	CODE CHANGE NUMBER(S)
902.1		FS7-06/07, F83-06/07, F84-06/07, FS80-07/08, G13-07/08, F163-07/08
903.2		FS37-06/07, CCC
903.2.1		F85-06/07, E8-07/08
903.2.1.1		E10-07/08
903.2.1.2		E10-07/08
903.2.1.3		E10-07/08
903.2.1.4		E10-07/08
903.2.2 (New)		G23-07/08
903.2.3	903.2.2	F85-06/07, E10-07/08, F133-07/08
903.2.4	903.3.3	G23-06/07
903.2.6	903.2.6	F135-07/08
903.2.7	903.2.8	F136-07/08
903.2.9.1	903.2.8.1	G8-06/07, G13-07/08, F136-07/08
903.2.9.2	903.2.8.2	G8-06/07, G13-07/08, F136-07/08
903.2.10	903.2.9	F89-06/07
903.2.11	903.2.10	F138-07/08, CCC
903.2.11.1	903.2.10.1	F90-06/07, G8-06/07
903.2.11.1.1	903.2.10.1.1	G23-07/08
903.2.11.1.2	903.2.10.1.2	G23-07/08
903.2.11.1.3	903.2.10.1.3	G23-07/08
903.2.11.2	903.2.10.2	G23-07/08
903.2.11.3	903.2.10.3	G23-07/08
903.2.11.4	903.2.12.1	F138-07/08
903.2.11.5	903.2.12.2	F138-07/08
903.2.11.6	903.2.13	F138-07/08
Table 903.2.11.6	Table 903.2.13	G131-06/07, F138-07/08
Deleted	903.2.12	CCC
903.3.1		F140-07/08
903.3.1.1		F140-07/08
903.3.1.1.1		G63-06/07, F140-07/08
903.3.1.2		F140-07/08
903.3.1.2.1		F96-06/07, F140-07/08
903.3.1.3		F144-07/08, F140-07/08

**CHAPTER 9
FIRE PROTECTION SYSTEMS**

2009 IBC	2006 IBC	CODE CHANGE NUMBER(S)
901.6.2		FS163-06/07
901.7		FS37-06/07

CODE CHANGES RESOURCE COLLECTION - INTERNATIONAL BUILDING CODE

CHAPTER 9 (continued)

CHAPTER 9 (continued)

2009 IBC	2006 IBC	CODE CHANGE NUMBER(S)
903.3.5.2		S140-07/08
903.4		F99-06/07, F147-07/08
903.4.1		F99-06/07, F147-07/08
905.3.1		G81-06/07
905.3.3		F104-06/07, F157-07/08
905.3.7		F158-07/08
905.4		F159-07/08
905.6.2		F105-06/07
906		FS165-06/07, CCC,
906.1		FS165-06/07, CCC
Table 906.1		F243-07/08
906.2		FS165-06/07, F160-07/08
906.3		FS165-06/07, CCC
Table 906.3(2)		FS165-06/07
906.4		FS165-06/07
906.5		FS165-06/07
906.6		FS165-06/07
906.7		FS165-06/07
906.8		FS165-06/07
906.9		FS165-06/07
906.10		FS165-06/07
907 (Reorganization)		F122-06/07
907 (New)		F118-06/07, F120-06/07, F122-06/07
907.1		F122-06/07
907.1.1		F122-06/07 F161-07/08
907.1.2 (New)		F161-07/08
907.1.3	907.1.2	F122-06/07, FS161-07/08
907.2		F122-06/07, F162-07/08, F163-07/08
907.2.1		F122-06/07
907.2.1.1		F122-06/07
907.2.2		F122-06/07, G23-07/08
907.2.2.1 (New)		G23-07/08
907.2.3 (New)		G23-07/08
907.2.4 (New)		G23-07/08
907.2.5		F122-06/07, F164-07/08
907.2.6		F122-06/07, F164-07/08, F165-07/08

2009 IBC	2006 IBC	CODE CHANGE NUMBER(S)
907.2.6.3		F122-06/07, FS118-06/07, F163-07/08
907.2.6.3.1		F122-06/07
907.2.6.3.2		F122-06/07
907.2.6.3.3		F122-06/07, F164-07/08
907.2.7		F122-06/07
907.2.7.1		F122-06/07, F164-07/08
907.2.8		F122-06/07
907.2.8.1		F122-06/07
907.2.8.2		F163-07/08
907.2.9.1		F166-07/08
907.2.9.2		F122-06/07
907.2.10 (New)		F167-07/08
907.2.10.1 (New)		F167-07/08
907.2.10.2 (New)		F167-07/08
907.2.10.3 (New)		F167-07/08
907.2.11	907.2.10	F167-07/08
907.2.11.1	907.2.10.1	F167-07/08
907.2.11.2	907.2.10.2	F167-07/08
907.2.11.3	907.2.10.3	F167-07/08
907.2.12	907.2.11	F163-07/08
907.2.13	907.2.12	F163-07/08, F168-07/08, G14-07/08, CCC
907.2.13.1	907.2.12.1	F163-07/08, F169-07/08
907.2.13.1.1	907.2.12.1.1	F169-07/08
907.2.13.1.2	907.2.12.1.2	F169-07/08
907.2.13.2	907.2.12.2	F87-07/08, F164-07/08
907.2.14	907.2.13	F163-07/08
907.2.15	907.2.14	F163-07/08
907.2.18	907.2.17	F163-07/08
907.2.19	907.2.18	E8-07/08
Deleted	907.2.18.1	F172-07/08
907.2.20		F172-07/08
907.2.22	907.2.21	F173-07/08
907.2.23	907.2.22	F174-07/08
907.3.1	907.4.1	F120-06/07, F179-07/08
907.3.3.1		F176-07/08
907.3.3.1.1		F176-07/08
907.4.3	907.5.3	F180-07/08
907.5	907.6	F164-07/08
907.5.2.1.1	907.6.2.1.1	F164-07/08
907.5.2.1.2	907.6.2.1.2	F164-07/08

CHAPTER 9 (continued)

CHAPTER 10
MEANS OF EGRESS

2009 IBC	2006 IBC	CODE CHANGE NUMBER(S)	2009 IBC	2006 IBC	CODE CHANGE NUMBER(S)
907.5.2.2	907.6.2.2	F164-07/08			
907.5.2.2.3 (New)		F164-07/08	1002.1		E5-06/07, E6-06/07, E111-06/07, E5-07/08, E7-07/08, E95-07/08, E110-07/08, E144-07/08
907.5.2.2.4	907.6.2.2.3	F164-07/08			
907.6.3.2	907.7.3.2	F164-07/08, G14-07/08			
907.6.4	907.7.4	F164-07/08			
909.8.1		F123-06/07			
909.11		FS37-06/07, F189-07/08	1003.2		E8-06/07, E11-07/08, E12-07/08
909.13.1		M16-07/08			
909.20.2		FS37-06/07, FS20-07/08	1003.3.2		E11-06/07
909.20.5		FS171-07/08	1003.3.3		E11-06/07
909.20.6.1		FS37-06/07, FS172-07/08	1003.3.4		E11-06/07
(Delete)	910.2.3	E114-07/08	1003.5		E13-07/08
Table 910.3		F194-07/08, F195-07/08	1005.1		CCC
910.3.4		FS37-06/07, F198-07/08	Deleted	Table 1005.1	E16-06/07 E19-07/08, CCC
910.3.5		F199-07/08	1005.2		E18-06/07, E20-07/08
910.4.4		FS37-06/07	1005.3 (New)		E17-06/07
911.1		F43-06/07, F84-07/08, F85-07/08, G46-07/08, CCC	1006.3		E10-07/08
912.2		F132-06/07	1007.1		E21-06/07
912.2.1		F201-07/08	1007.2		E23-06/07
912.3		F133-06/07	1007.2.1		E10-07/08
912.3.2 (New)		F133-06/07	1007.3		E23-06/07, E25-06/07, E28-06/07, E29-06/07, E30-06/07, E29-07/08, E105-07/08
912.3.3 (New)		F133-06/07	1007.4		E25-06/07, E27-06/07, E28-06/07
912.4		F202-07/08	1007.6		E23-06/07, E35-06/07
913 (New)		FS166-06/07	1007.6.2		E23-06/07
913.1 (New)		FS166-06/07	1007.6.3		E34-07/08
913.2 (New)		FS166-06/07	Deleted	1007.6.5	E35-07/08
913.2.1 (New)		FS166-06/07, F203-07/08	Deleted	1007.7	E35-07/08
913.3 (New)		FS166-06/07	Deleted	1007.8.3	E35-07/08
913.3.1 (New)		FS166-06/07	1007.8 (New)		E34-07/08
913.4 (New)		FS166-06/07	1007.8.1 (New)		E34-07/08
913.4.1 (New)		FS166-06/07	1007.8.2 (New)		E34-07/08
913.5 (New)		FS166-06/07	1007.9 (New)		E35-07/08
914 (New)		FS168-06/07	1007.10 (New)		E35-07/08
914.1 (New)		FS168-06/07	1007.11	1007.6.4	E34-07/08, E35-07/08
914.1.1 (New)		FS168-06/07	1008.1.1.1		E40-06/07
914.1.2 (New)		FS168-06/07			
914.2 (New)		FS168-06/07			
915 (New)		CCC			

CODE CHANGES RESOURCE COLLECTION - INTERNATIONAL BUILDING CODE

CHAPTER 10 (continued)

CHAPTER 10 (continued)

2009 IBC	2006 IBC	CODE CHANGE NUMBER(S)
1008.1.2		E41-06/07, E43-06/07, E39-07/08
1008.1.3	1008.1.2	E43-06/07
1008.1.3.1	1008.1.2	E43-06/07
1008.1.4.1	1008.1.3.1	E44-06/07
1008.1.4.4	1008.1.3.4	E41-07/08
1008.1.9.3	1008.1.8.3	E47-06/07
1008.1.9.4	1008.1.8.4	E45-07/08, E46-07/08, E47-07/08
1008.1.9.5.1 (New)		E48-07/08
1008.1.9.6 (New)		E51-07/08
1008.1.9.8 (New)		E52-06/07
1008.1.9.9 (New)		E52-07/08
1008.1.10	1008.1.9	E53-07/08, E54-07/08, E55-07/08
1008.1.10.1 (New)		E53-07/08
1008.10.10.2 (New)		E53-07/08
1009.2		E57-07/08
1009.3 (New)		E58-07/08
1009.4 (New)		E60-07/08
1009.4.1 (New)		E60-07/08
1009.4.2	1009.3	E58-07/08, E60-07/08, E62-07/08, E74-07/08
1009.4.4	1009.3.2	E58-07/08
1009.4.5	1009.3.3	E63-06/07, E64-07/08, E66-07/08, E67-07/08
1009.5	1009.4	E64-06/07
1009.6.1	1009.5.1	E65-06/07
1007.7	1009.6	E68-07/08
1009.9	1009.8	E67-06/07
1009.10.2	1009.9.2	E72-07/08
1009.11 (New)		E74-07/08, CCC
1009.12	1009.10	E69-06/07, E70-06/07
1009.13	1009.11	G8-06/07,
1009.14 (New)		E76-07/08
1010.2		E152-06/07
1010.5.1		E74-06/07
1010.6.3		E75-06/07
1010.6.4		E75-06/07
1010.8		E69-06/07
1010.9		E77-06/07
1010.9.1		E78-06/07

2009 IBC	2006 IBC	CODE CHANGE NUMBER(S)
1011.1		E78-07/08, E79-07/08
1011.3		E139-06/07, E35-07/08
1011.4		E82-06/07, E83-06/07
1012.2		E86-06/07, E74-07/08
1012.3		E88-06/07, CCC
1012.3.1	1012.3	CCC
1012.3.2	1012.3	CCC
1012.4		E89-06/07, E90-06/07
1012.5 (New)		E91-06/07
1012.6	1012.5	E93-06/07, E152-06/07, E74-07/08, E82-07/08, CCC
1013.1		G223-06/07, E85-07/08
1013.1.1 (New)		E85-07/08
1013.2		E99-06/07, E74-07/08, E85-07/08
1013.3		E100-06/07, E74-07/08, E85-07/08
1013.5		E85-07/08
1013.6		E85-07/08
1014.1		E91-07/08
1014.2		G84-06/07, E92-07/08
1014.2.1		E93-07/08
1014.2.2		E104-06/07, E105-06/07
1014.2.3 through 1014.2.4.4	1014.2.2	E105-06/07
1014.2.5 (New)		E96-07/08
1014.2.6	1014.2.2	E105-06/07
1014.2.7 (New)		E106-06/07
1014.3		E107-06/07, E108-06/07, E152-06/07
1015.1		E113-06/07, E115-06/07, E127-07/08
Table 1015.1		E127-07/08
1015.1.1		E113-06/07
1015.5		E101-07/08
1016.1		E122-06/07, G8-06/07, E110-07/08

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CHAPTER 10 (continued)

2009 IBC	2006 IBC	CODE CHANGE NUMBER(S)
Table 1016.1		E111-07/08, E114-07/08
Deleted	1016.2	E112-07/08, E114-07/08
1017.1 through 1017.4.3	1014.4 through 1014.4.3.3	E18-06/07, E110-06/07, E111-06/07
1018.2	1017.2	E18-06/07, E121-07/08, CCC
1018.3 (New)		E18-06/07, CCC
1018.4	1017.3	E130-06/07
1018.5	1017.4	E122-07/08
1019 (New)		E111-06/07
1019.1 through 1019.3	1014.5 through 1014.5.2	E111-06/07
1020	1018	E111-06/07
1021	1019	E111-06/07
1021.1	1019.1	E113-06/07, E115-06/07, E122-06/07, G71-06/07, E110-07/08, E126-07/08
1021.2	1019.2	E113-06/07, E136-06/07, E127-07/08
Table 1021.2	Table 1019.2	E136-06/07, E127-07/08
1021.1.2	1019.1.2	E134-06/07
1021.2.2	1019.1.2	E134-06/07
1022 Title	1020 Title	CCC
1022.1	1020.1	E122-06/07, E138-06/07, E155-06/07, G8-06/07, E8-07/08, E10-07/08, E129-07/08
1022.2 (New)		E130-07/08
1022.2.1 (New)		E130-07/08
1022.3	1020.1.1	E7-07/08, E130-07/08
1022.4	1020.1.2	E130-07/08, CCC
1022.7	1020.1.5	E10-07/08,
1022.8	1020.1.6	E139-06/07, E140-06/07, E130-07/08 E148-07/08
1022.8.1	1020.1.6.1	E148-07/08
1022.8.1 (New)		E140-06/07
1022.9	1020.1.7	E8-07/08, E10-07/08, E130-07/08, E134-07/08

2009 IBC	2006 IBC	CODE CHANGE NUMBER(S)
1022.9.1	1020.1.7.1	E130-07/08, E134-07/08
1023	1021	E111-06/07
1023.2	1021.2	E18-06/07
1023.3	1021.3	FS37-06/07
1023.4 (New)		E130-07/08
1023.5	1021.4	E7-07/08, E130-07/08, CCC
1024 (New)		E84-06/07, E130-07/08, E145-07/08, E146-07/08, E147-07/08
1025.1	1022.1	E136-07/08, E138-07/08
1025.2	1022.2	E146-06/07, FS37-06/07
1025.4	1022.4	E136-07/08, E138-07/08
1026	1023	E111-06/07
1026.2	1023.2	E147-06/07
1026.6	1023.6	E10-07/08
1027	1024	E111-06/07
1027.1	1024.1	E150-06/07, E10-07/08, E138-07/08, E140-07/08
1027.5.1	1024.5.1	E18-06/07
1028	1025	E111-06/07
1028.1	1025.1	E152-06/07
1028.1.1	1025.1.1	E141-07/08
1028.2	1025.2	E152-06/07
1028.3	1025.3	E152-06/07
1028.4	1025.4	E153-06/07
1028.5	1025.5	E155-06/07
1028.5.1	1025.5.1	E155-06/07
1028.9	1025.9	E152-06/07
1028.10	1025.10	E158-06/07
1028.13	1025.13	E69-06/07
1028.14.2	1025.14.2	E160-06/07
1029	1026	E111-06/07

CHAPTER 11
ACCESSIBILITY

2009 IBC	2006 IBC	CODE CHANGE NUMBER(S)
1103.2.3		E165-06/07
1103.2.12		E151-07/08
1103.2.13 (New)		E151-07/08
1104.3		E169-06/07, E152-07/08

CHAPTER 11 (continued)

2009 IBC	2006 IBC	CODE CHANGE NUMBER(S)
1104.4		E170-06/07, E153-07/08
1104.5		E160-07/08
1106.2		E173-06/07
1106.3		E173-06/07
1106.4		E173-06/07
1106.5		E156-07/08
1106.7.4 (New)		E174-06/07
1107.3		E152-07/08
1107.5.1.2		E159-07/08
1107.5.1.2.1		E159-07/08
1107.5.2.2		E159-07/08
1107.5.3.2		E159-07/08
1107.6.1.1		E161-07/08
Table 1107.6.1.1		E176-06/07, E159-07/08
1107.6.1.2		E159-07/08
1107.6.2.1.1		E161-07/08
1107.6.3		E159-07/08
1107.6.4.2		E159-07/08
1107.7		E160-07/08
1107.7.1		E159-07/08, E160-07/08
1107.7.5		E160-07/08
1108.2.1		E163-07/08
1108.2.3 (New)		E164-07/08
1108.2.4	1108.2.4	E169-06/07
1108.2.9.1	1108.2.8.1	E181-06/07, E182-06/07
1108.4.1		E183-06/07
1108.4.1.1 through 1108.4.1.5 (New)		E183-06/07
1109.1		E160-07/08
1109.2		E166-07/08
1109.2.1 through 1109.2.1.7		E185-06/07
1109.2.2		E166-07/08
1109.2.3 (New)		E168-07/08, CCC
Deleted	1109.10	E187-06/07
1109.10.1	1109.11.1	E188-06/07
1109.12.1	1109.13.1	E190-06/07
1109.13	1103.2.14	E168-06/07
1110.1		E35-07/08
1110.2		E35-07/08
1110.3		E139-07/08, E35-07/08

**CHAPTER 12
INTERIOR ENVIRONMENT**

2009 IBC	2006 IBC	CODE CHANGE NUMBER(S)
1202		G178-07/08
1203.2		EC28-06/07

CHAPTER 12 (continued)

2009 IBC	2006 IBC	CODE CHANGE NUMBER(S)
1203.2.1		G171-06/07, G179-07/08
1203.3		G13-07/08
1203.3.3.2		EC28-06/07
1205.4.1		CCC
1206.2		G6-06/07
1206.3		G6-06/07
1207.2.1 (New)		G180-07/08
1210.1		G174-06/07
1210.2		G182-07/08

**CHAPTER 14
EXTERIOR WALLS**

2009 IBC	2006 IBC	CODE CHANGE NUMBER(S)
1402.1		FS170-06/07, FS173-07/08, FS175-07/08
1403.2		FS175-07/08, FS177-07/08
1404.10		FS172-06/07
1404.11 (New)		FS175-07/08
Table 1405.2		S113-06/07
1405.3 (New)		FS177-07/08
1405.3.1 (New)		FS177-07/08
Table 1405.3.1 (New)		FS177-07/08
1405.3.2 (New)		FS177-07/08
1405.3.3 (New)		FS177-07/08
1405.4.2	1405.3.2	FS173-06/07
1405.5	1405.4	G6-06/07, FS178-07/08
1405.6.2	1405.5.2	FS176-06/07, FS179-07/08, S174-07/08
1405.11.4	1405.10.4	CCC
1405.14	1405.13	FS181-07/08
1405.16	1405.15	FS180-06/07
1405.16.1 (New)		FS182-07/08
1405.16.2 (New)		FS182-07/08
Deleted	1405.17	FS182-07/08
Deleted	1405.17.1	FS182-07/08
Deleted	1405.17.2	FS182-07/08
1406.2.2		FS182-06/07, G6-06/07, G81-06/07, FS178-07/08, FS183-07/08
1406.2.4		FS183-06/07
1406.3		G6-06/07

CHAPTER 14 (continued)

CHAPTER 15 (continued)

2009 IBC	2006 IBC	CODE CHANGE NUMBER(S)
1407.8		FS185-07/08
1407.9		FS11-06/07, FS186-07/08
1407.10.1		FS11-06/07
1407.10.2		FS10-06/07
1407.10.4		FS187-07/08
1407.11.1		FS178-07/08
1407.11.2		FS178-07/08
1407.13 (New)		FS188-07/08
1408 (New)		FS175-07/08

2009 IBC	2006 IBC	CODE CHANGE NUMBER(S)
Table 1507.2.7.1(2)		S6-07/08
1507.2.8.2		FS200-06/07
1507.2.9.2		FS201-06/07, S27-07/08
1507.4.4		S30-07/08
1507.5.3		FS200-06/07
1507.5.4	1507.5.3	FS200-06/07
1507.6.3		FS200-06/07
1507.6.4	1507.6.3	FS200-06/07
1507.7.3		FS200-06/07
1507.7.4	1507.7.3	FS200-06/07
Table 1507.8		FS200-06/07, FS204-06/07
1507.8.3		FS200-06/07
1507.8.4	1507.8.3	FS200-06/07
1507.9.3		FS200-06/07
1507.9.4	1507.9.3	FS200-06/07
1507.11.2		S33-07/08
1507.12.3 (New)		FS208-06/07, S34-07/08
1507.13.3 (New)		FS209-06/07, S34-07/08
1507.14.2		S35-07/08
1507.15.2		S37-07/08
1507.16 (New)		FS210-06/07
1509.2		S42-07/08
1509.2.1 (New)		S42-07/08
1509.2.2 (New)		S42-07/08
1509.2.3 (New)		S42-07/08
1509.2.4	1509.2.1	FS211-06/07, CCC
1509.5.1		G81-06/07
1510.3		FS212-06/07

**CHAPTER 15
ROOF ASSEMBLIES AND ROOF STRUCTURES**

2009 IBC	2006 IBC	CODE CHANGE NUMBER(S)
1502.1		FS185-06/07, FS186-06/07, FS2-07/08, S2-07/08, S42-07/08
1503.1		S4-07/08
1503.4		FS187-06/07
1503.4.1 (New)		FS187-06/07
1503.4.2 (New)		FS187-06/07
1503.6	1507.2.9.4	FS188-06/07
1504.1.1		FS191-06/07, S6-07/08
1504.2		FS192-06/07
Deleted	1504.2.1	S7-07/08
Deleted	Table 1504.2.1	CCC
1504.3		FS192-06/07
1504.3.1		S9-07/08
1504.4		FS196-06/07
1504.8		FS192-06/07, FS198-06/07
Table 1504.8		FS192-06/07, FS198-06/07
Table 1505.1		G6-06/07
1505.2		FS199-06/07, S18-07/08, S19-07/08, S20-07/08
1505.3		FS199-06/07,
1507.2.5		S25-07/08
1507.2.7		FS191-06/07
1507.2.7.1 (New)		FS191-06/07, S6-07/08
Table 1507.2.7.1(1) (New)		FS191-06/07, S6-07/08

**CHAPTER 16
STRUCTURAL DESIGN**

2009 IBC	2006 IBC	CODE CHANGE NUMBER(S)
1602.1		S9-06/07, S62-07/08
1603.1		S47-07/08
1603.1.6 (New)		S47-07/08
Table 1604.3		S50-07/08
1604.3.3		S51-07/08, S204-07/08
1604.3.4		S174-07/08
1604.5		S52-07/08
Table 1604.5		S1-06/07, S3-06/07, S4-06/07

CODE CHANGES RESOURCE COLLECTION - INTERNATIONAL BUILDING CODE

CHAPTER 16 (continued)

2009 IBC	2006 IBC	CODE CHANGE NUMBER(S)
1604.5.1		S52-07/08
1604.8.2		S57-07/08
1604.8.3		S58-07/08
1604.10		CCC
1605.1		S8-06/07, S60-07/08
1605.1.1 (New)		S61-07/08
1605.2.2		S62-07/08
1605.3.1		S63-07/08
1605.3.1.1		S7-06/07
1605.3.1.2		S62-07/08
1605.3.2		S63-07/08
Deleted	1605.4	S8-06/07
1605.4	1605.5	S8-06/07, CCC
Table 1607.1		S9-06/07, G76-07/08, S66-07/08, S68-07/08, S70-07/08, S71-07/08
1607.7		G76-07/08, S66-07/08
1607.7.1		S66-07/08
1607.7.1.1		S66-07/08
Deleted	1607.7.1.3	S14-06/07
1607.7.3		G76-07/08, G77-07/08, S66-07/08
1607.9		S74-07/08, S76-07/08,
1607.9.1		S75-07/08
T. 1607.9.1		S75-07/08
1607.9.1.1	1607.9.1.4	S75-07/08
1607.9.1.2	1607.9.1.1	S75-07/08
1607.9.1.3	1607.9.1.2	S75-07/08
1607.9.1.4	1607.9.1.3	S75-07/08
1607.9.1.5 (New)		S75-07/08
1607.9.2		S77-07/08
1607.11.1		S71-07/08, S76-07/08
1607.11.2		S116-06/07, S76-07/08
1607.11.2.1		S71-07/08, S76-07/08
1607.11.2.2		S70-07/08, S71-07/08, S76-07/08
1609.1.1		S15-06/07, S17-06/07, S79-07/08, S80-07/08, S84-07/08

CHAPTER 16 (continued)

2009 IBC	2006 IBC	CODE CHANGE NUMBER(S)
1609.1.1.1		S79-07/08, S80-07/08
1609.1.1.2 (New)		S17-06/07, CCC
1609.1.1.2.1 (New)		S17-06/07
1609.1.1.2.2 (New)		S17-06/07
1609.1.2		S18-06/07, S19-06/07
Table 1609.1.2		S19-06/07
1609.1.2.2 (New)		S20-06/07
1609.5.2		FS191-06/07, S6-07/08
1609.6 (New)		S84-07/08
1609.6.1 (New)		S84-07/08
1609.6.2 (New)		S84-07/08
1609.6.2 (New)		S84-07/08
Table 1609.6.2(1) (New)		S84-07/08
Table 1609.6.2(2) (New)		S84-07/08
1609.6.3 through 1609.6.4.4.1 (New)		S84-07/08
1610.1		S146-07/08, S149-07/08
Table 1610.1		S149-07/08
1611.1		FS187-06/07
Figure 1611.1 (New)		FS187-06/07
1612.2		G13-07/08
1612.3		G4-06/07,
1612.3.1 (New)		S22-06/07,
1612.3.2 (New)		S88-07/08
1612.4		S62-07/08, S89-07/08
1613.3		G203-07/08
1613.5.6		CCC
1613.5.6.1		CCC
1613.6.1		S82-06/07, S116-06/07
1613.6.3 (New)		S23-06/07
1613.6.4 (New)		S24-06/07
1613.6.5 (New)		S26-06/07
1613.6.6 (New)		S94-07/08
1613.6.7 (New)		S92-07/08
1613.6.8 (New)		S93-07/08
1613.7 (New)		S96-07/08
1614 (New)		S101-07/08

CHAPTER 17

STRUCTURAL TESTS AND SPECIAL INSPECTIONS

2009 IBC	2006 IBC	CODE CHANGE NUMBER(S)
1702.1		FS156-06/07, S28-06/07, S29-06/07, S47-06/07, S102-07/08

CHAPTER 17 (continued)

CHAPTER 17 (continued)

2009 IBC	2006 IBC	CODE CHANGE NUMBER(S)	2009 IBC	2006 IBC	CODE CHANGE NUMBER(S)
1703.1.1		S103-07/08	1706 (New)		S44-07/08,
Deleted	1703.6	S30-06/07			S45-06/07
1704.1		S31-06/07,	1706.1 (New)		S44-06/07,
		S32-06/07,			S45-06/07
		S107-07/08	1706.2 (New)		S44-06/07
1704.1.2		S107-07/08	1706.3 (New)		S44-06/07,
1704.2.2		S109-07/08			S45-06/07,
1704.3		S110-07/08			S133-07/08
Table 1704.3		S112-07/08,	1706.4 (New)		S45-06/07
		S117-07/08,	1707.1		S125-07/08
		S172-07/08	1707.2		S128-07/08
1704.3.1		S111-07/08	1707.4		S129-07/08
1704.3.1.1 (New)		S111-07/08	Deleted	1707.5	S122-07/08
1704.3.1.2 (New)		S110-07/08	1707.6	1707.7	S42-06/07,
1704.3.1.3 (New)		S111-07/08			S130-07/08
1704.3.3		S111-07/08	Deleted	1708.1 through	
1704.3.4 (New)		S115-07/08		Table 1708.1.4	S118-07/08
1704.4		S35-06/07	1708.1	1708.2	S46-06/07,
1704.5		S118-07/08,			S125-07/08,
		S174-07/08, CCC			S135-07/08
1704.5.1		S174-07/08	1708.2	1708.3	S136-07/08,
Table 1704.5.1		S118-07/08,			S172-07/08
		S174-07/08	1708.3	1708.4	S37-06/07,
1704.5.3		S174-07/08			S137-07/08, CCC
Table 1704.5.2	Table 1704.5.3	S118-07/08,	1708.4	1708.5	S118-07/08
		S174-07/08	1709	1706	S44-06/07,
1704.6.2		S115-07/08			S45-06/07,
1704.7		S37-06/07,			S127-07/08
		S121-07/08,	1710	1709	S44-06/07,
		S122-07/08			S45-06/07
Table 1704.7		S122-07/08	1710.1	1709.1	S44-06/07,
1704.8		S37-06/07,			S45-06/07,
		S121-07/08,			S47-06/07
		S122-07/08	1710.2	1709.2	S35-06/07,
Table 1704.8		S122-07/08			S37-06/07,
1704.9		S37-06/07,			S44-06/07,
		S121-07/08,			S45-06/07,
		S122-07/08			S140-07/08
Table 1704.9		S122-07/08,	1710.3	1709.3	S37-06/07,
		S123-07/08			S44-06/07,
1704.10 (New)		S122-07/08			S45-06/07
1704.11 (New)		S171-07/08	1710.4	1709.4	CCC
1704.12 through	1704.10 through		1711	1710	S127-07/08
1704.12.6.3	1704.10.5.2	S39-06/07,	1712	1711	S127-07/08
		S122-07/08	1713	1712	S127-07/08
1704.14.1 (New)		FS175-07/08	1714	1713	S127-07/08
1705.3		S35-06/07,	1715	1714	S127-07/08
		S125-07/08	1715.5.2	1714.5.2	S48-06/07,
1705.3.1 through 1705.3.5 (New)		S125-07/08			S127-07/08

CODE CHANGES RESOURCE COLLECTION - INTERNATIONAL BUILDING CODE

**CHAPTER 18
SOILS AND FOUNDATIONS**

CHAPTER 18 (continued)

2009 IBC	2006 IBC	CODE CHANGE NUMBER(S)	2009 IBC	2006 IBC	CODE CHANGE NUMBER(S)
1801.1		S89-07/08	1805.3.2.1	1807.3.2.1	S158-07/08
1801.2		S150-07/08	1805.3.3	1807.3.3	S158-07/08
1802.1	1808.1	S160-07/08	(Deleted)	1805.4	S150-07/08
1803	1802	S146-07/08	1805.4	1807.4	S158-07/08
1803.1	1802.1	S146-07/08	1805.4.1	1807.4.1	S158-07/08
1803.2	1802.2	S146-07/08	1805.4.2	1807.4.2	S158-07/08
Deleted	1802.3	S146-07/08	1805.4.3	1807.4.3	S158-07/08
1803.3	1802.4	S146-07/08	Deleted	1805.5.1.2	S149-07/08
1803.3.1	1802.4.1	S146-07/08	Deleted	1805.5.2	S149-07/08
1803.4	1802.5	S146-07/08	Deleted	1805.5.4	S149-07/08
1803.5 (New)		S146-07/08	Deleted	1805.5.5	S149-07/08
1803.5.1	1802.3.1	S146-07/08	Deleted	1805.5.6	S149-07/08
1803.5.2	1802.2.1	S146-07/08	Deleted	1805.6	S149-07/08
1803.5.3	1802.3.2, 1802.2.2	S146-07/08	1806	1804	S147-07/08
1803.5.4	1802.2.3	S146-07/08	1806.1	1804.1	S147-07/08
1803.5.5	1802.2.4	S146-07/08	1806.2	1804.2	S147-07/08
1803.5.6	1802.2.5	S146-07/08	Table 1806.2	Table 1804.2	S147-07/08
1803.5.7 (New)		S146-07/08	1806.3	1804.3	S147-07/08
1803.5.8 (New)		S146-07/08	1806.3.1 (New)	1804.3	S147-07/08
1803.5.9 (New)		S146-07/08	1806.3.2 (New)	1804.3	S147-07/08
1803.5.10 (New)		S146-07/08	1806.3.3	1804.3.1	S147-07/08
1803.5.11	1802.2.6	S140-07/08, S146-07/08	1806.3.4 (New)		S147-07/08
1803.5.12	1802.2.7	S140-07/08, S146-07/08	1807 (New)		S149-07/08
1803.6	1802.6	S47-07/08, S146-07/08	1807.1 (New)		S149-07/08
1804	1803	S146-07/08	1807.1.1 (New)		S149-07/08
1804.1	1803.1	S146-07/08	1807.1.2 (New)		S149-07/08
1804.2	1803.2	S146-07/08	1807.1.3	1805.5.1.3	S140-07/08, S149-07/08
1804.3	1803.3	S146-07/08	1807.1.4	1805.4.6	S149-07/08, S154-07/08
1804.4	1803.4	S146-07/08	1807.1.5	1805.5	S149-07/08
1804.5	1803.5	S122-07/08, S146-07/08	1807.1.6 (New)		S149-07/08
1804.6	1803.6	S146-07/08	1807.1.6.1	1805.5.1, 1805.5.1.1	S149-07/08
1805	1807	S158-07/08	1807.1.6.2	1805.5.2.1	S149-07/08
1805.1	1807.1	S158-07/08	Table 1807.1.6.2	Table 1805.5(5)	S149-07/08
1805.1.1	1807.1.1	S158-07/08	1807.1.6.2.1	1805.5.5.1	S149-07/08
1805.1.2	1807.1.2	S158-07/08	1807.1.6.3	1805.5.2.2	S149-07/08, S174-07/08
1805.1.2.1	1807.1.2.1	S158-07/08, S159-07/08	Table 1807.1.6.3(1)	Table 1805.5(1)	S149-07/08
1805.1.3	1807.1.3	S158-07/08	Table 1807.1.6.3(2)	Table 1805.5(2)	S149-07/08
1805.2	1807.2	S154-07/08, S158-07/08	Table 1807.1.6.3(3)	Table 1805.5(3)	S149-07/08
1805.2.1	1807.2.1	S158-07/08	Table 1807.1.6.3(4)	Table 1805.5(4)	S149-07/08
1805.2.2	1807.2.2	S158-07/08	1807.1.6.3.1	1805.5.3	S149-07/08
1805.2.2.1	1807.2.2.1	S158-07/08	1807.1.6.3.2	1805.5.5.2	S149-07/08
1805.3	1807.3	S158-07/08	1807.2 (New)		S149-07/08
1805.3.1	1807.3.1	S158-07/08	1807.2.1	1806.1	S149-07/08, S157-07/08
1805.3.2	1807.3.2	S158-07/08	1807.2.2 (New)		S149-07/08
			1807.2.3 (New)		S149-07/08, S156-07/08
			1807.3	1805.7	S149-07/08

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CHAPTER 18 (continued)

2009 IBC	2006 IBC	CODE CHANGE NUMBER(S)
1807.3.1	1805.7.1	S149-07/08
1807.3.2	1805.7.2	S149-07/08
1807.3.2.1	1805.7.2.1	S149-07/08
1807.3.2.2	1805.7.2.2	S149-07/08
1807.3.2.3	1805.7.2.3	S149-07/08
1807.3.3	1805.7.3	S149-07/08, S152-07/08
1808	1805	S150-07/08
1808.1 (New)		S150-07/08
1808.2	1805.4.1	S150-07/08
Deleted	1808.2.8	S160-07/08
Deleted	1808.2.9	S160-07/08
Deleted	1808.2.14	S160-07/08
Deleted	1808.2.16	S160-07/08
Deleted	1808.2.23	S160-07/08
Deleted	1808.2.23.2	S150-07/08, S160-07/08
1808.3	1805.4.1.1	S150-07/08
1808.3.1	1801.2.1	S145-07/08, S150-07/08
1808.4	1805.4.1.2	S150-07/08
1808.5	1805.2.3	S150-07/08
1808.6	1805.8	S150-04/08
1808.6.1	1805.8.1	S150-07/08
1808.6.2	1805.8.2	S150-07/08
1808.6.3	1805.8.3	S150-07/08
1808.6.4	1805.8.4	S150-07/08
1808.7	1805.3	S150-07/08
1808.7.1	1805.3.1	S150-07/08
Figure 1808.7.1	Figure 1805.3.1	S150-07/08, S151-07/08
1808.7.2	1805.3.2	S150-07/08
1808.7.3	1805.3.3	S150-07/08
1808.7.4	1805.3.4	S150-07/08
1808.7.5	1805.3.5	S146-07/08, S150-07/08
1808.8	1805.4.2	S150-07/08
1808.8.1	1805.4.2.1, 1810.1.1	S150-07/08, S152-07/08, S169-07/08
Table 1808.8.1 (New)		S150-07/08
1808.8.2 (New)		S150-07/08
Table 1808.8.2 (New)		S150-07/08
1808.8.3	1805.4.2.4	S150-07/08
1808.8.4	1805.4.2.5	S150-07/08
1808.8.5	1805.4.2.6	S150-07/08, S172-07/08
1808.8.6	1805.9	S35-06/07, S150-07/08, S152-07/08, S155-07/08, S172-07/08

2009 IBC	2006 IBC	CODE CHANGE NUMBER(S)
1808.9	1812.7	S150-07/08, S174-07/08
1809 (New)		S150-07/08
1809.1	1805.1	S150-07/08, CCC
Deleted	1809.1.4	S160-07/08
1809.2 (New)		S150-07/08, S160-07/08
Deleted	1809.2.1.4	S160-07/08
Deleted	1809.2.2.1	S150-07/08, S160-07/08
Deleted	1809.2.2.3	S160-07/08
Deleted	1809.2.2.5	S150-07/08, S160-07/08
Deleted	1809.2.3.3	S160-07/08
Deleted	1809.2.3.4	S160-07/08
Deleted	1809.2.3.5	S150-07/08
Deleted	1809.3	S160-07/08
1809.3 (New)		S150-07/08
(Deleted)	1809.3.2	S160-07/08
1809.4	1805.2	S150-07/08
1809.5	1805.2.1	S150-07/08
1809.6	1805.2.2	S150-07/08
1809.7 (New)		S150-07/08
Table 1809.7	Table 1805.4.2	S150-07/08
1809.8	1805.4.2.3	S150-07/08
1809.9	1805.4.3	S150-07/08
1809.9.1	1805.4.3.1	S150-07/08
1809.9.2	1805.4.3.2	S150-04/08
1809.10	1805.5.7	S35-06/07, S150-07/08
1809.11	1805.4.4	S150-07/08
1809.12	1805.4.5	S150-07/08
1809.13	1805.4.2.2	S150-07/08, S153-07/08
Deleted	1808.2	S160-07/08
Deleted	1808.2.1	S160-07/08
Deleted	1810	S160-07/08
1810 (New)		S160-07/08
1810.1 (New)		S160-07/08
1810.1.1	1808.2.2	S146-07/08, S160-07/08
1810.1.2	1808.2.18	S160-07/08
Deleted	1810.1.3	S150-07/08, S160-07/08
1810.1.3 (New)		S160-07/08
1810.1.4	1808.2.3	S160-07/08
Deleted	1810.2	S160-07/08
1810.2 (New)		S160-07/08
1810.2.1	1808.2.9.1, 1808.2.9.2	S160-07/08, S164-07/08, S165-07/08

CODE CHANGES RESOURCE COLLECTION - INTERNATIONAL BUILDING CODE

CHAPTER 18 (continued)

CHAPTER 18 (continued)

2009 IBC	2006 IBC	CODE CHANGE NUMBER(S)	2009 IBC	2006 IBC	CODE CHANGE NUMBER(S)
Deleted	1810.2.2	S160-07/08	1810.3.3.1.1	1808.2.8.2	S160-07/08
1810.2.2	1808.2.5	S35-06/07, G6-06/07, G81-06/07, S160-07/08	1810.3.3.1.2	1808.2.8.3	S160-07/08
1810.2.3	1808.2.12	S160-07/08, S166-07/08	1810.3.3.1.3	1808.2.8.3.1	S160-07/08
Deleted	1810.2.4	S160-07/08	1810.3.3.1.4	1808.2.8.4	S146-07/08, S160-07/08
1810.2.4	1808.2.23.1.2	S160-07/08	1810.3.3.1.5	1808.2.8.5	S160-07/08, S161-07/08, S162-07/08
1810.2.4.1	1808.23.2.1	S52-06/07, S53-06/07, S160-07/08, S172-07/08	1810.3.3.1.6	1808.2.8.5	S160-07/08, S162-07/08
Deleted	1810.2.5	S150-07/08	1810.3.3.1.7	1808.2.8.6	S160-07/08
1810.2.5 (New)		S160-07/08	1810.3.3.1.8	1808.2.8.7	S160-07/08
Deleted	1810.3	S160-07/08	1810.3.3.1.9 (New)		S171-07/08
1810.3 (New)		S160-07/08	1810.3.3.2	1808.2.9.3	S160-07/08, S166-07/08
Deleted	1810.3.1	S160-07/08	1810.3.4	1808.2.11	S160-07/08
1810.3.1 (New)		S160-07/08, S171-07/08	Deleted	1810.3.5	S160-07/08
1810.3.1.1 (New)		S160-07/08	1810.3.5 (New)		S160-07/08
1810.3.1.2 (New)		S160-07/08	1810.3.5.1	1809.2.1.2	S160-07/08
1810.3.1.3	1808.2.8.8	S160-07/08, S163-07/08	1810.3.5.2 (New)		S160-07/08
1810.3.1.4	1809.2.1.1	S160-07/08	1810.3.5.2.1 (New)		S160-07/08
1810.3.1.5 (New)		S171-07/08	1810.3.5.2.2	1810.3.2	S160-07/08, S167-07/08
1810.3.1.6	1810.5.1	S160-07/08	1810.3.5.2.3 (New)		S160-07/08
1810.3.2 (New)		S160-07/08	1810.3.5.3 (New)		S160-07/08
1810.3.2.1	1810.2.1	S160-07/08	1810.3.5.3.1	1809.3.3	S160-07/08
1810.3.2.1.1 (New)		S160-07/08, S172-07/08	1810.3.5.3.2	1809.3.4, 1810.6.3	S160-07/08
1810.3.2.1.2 (New)		S168-07/08	1810.3.5.3.3 (New)		S171-07/08
1810.3.2.2	1809.2.3.1	S150-07/08, S152-07/08, S160-07/08	1810.3.6	1808.2.7	S160-07/08
1810.3.2.3	1809.3.1	S160-07/08	1810.3.6.1 (New)		S160-07/08
1810.3.2.4	1809.1, 1809.1.1	S160-07/08	1810.3.7 (New)		S160-07/08
1810.3.2.4.1	1809.1.2	S160-07/0	1810.3.8	1809.2.1	S160-07/08
1810.3.2.5	1809.2.17	S160-07/08	1810.3.8.1	1809.2.1.3	S160-07/08
1810.3.2.6 (New)		S160-07/08	1810.3.8.2	1809.2.2	S160-07/08
Table 1810.3.2.6 (New)		S160-07/08, S171-07/08	1810.3.8.2.1	1809.2.2.2	S160-07/08
1810.3.2.7	1810.5.2 through 1810.5.2.4	S152-07/08, S160-07/08	1810.3.8.2.2	1809.2.2.2.1	S160-07/08
1810.3.2.8	1808.2.10	S147-07/08, S160-07/08, S167-07/08	1810.3.8.2.3	1809.2.2.2.2	S160-07/08
1810.3.3	1808.2.8.1	S160-07/08	1810.3.8.3	1809.2.3	S160-07/08
1810.3.3.1 (New)		S160-07/08, S171-07/08	1810.3.8.3.1	1809.2.3.2	S160-07/08
			1810.3.8.3.2	1809.2.3.2.1	S160-07/08
			1810.3.8.3.3	1809.2.3.2.2	S160-07/08
			1810.3.9 (New)		S160-07/08
			1810.3.9.1 (New)		S160-07/08
			1810.3.9.2 (New)		S160-07/08
			1810.3.9.3	1810.1.2, 1810.3.4	S160-07/08
			1810.3.9.4	1812.4	S160-07/08
			1810.3.9.4.1	1810.1.2.1	S160-07/08
			1810.3.9.4.2	1810.1.2.2, 1810.5.4.1	S160-07/08
			1810.3.9.4.2.1 (New)		S160-07/08, S172-07/08

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CHAPTER 18 (continued)

2009 IBC	2006 IBC	CODE CHANGE NUMBER(S)
1810.3.9.4.2.2 (New)		S160-07/08, S172-07/08
1810.3.9.5	1812.6	S160-07/08 1266)
1810.3.9.6	1810.7.1, 1810.7.3, 1810.7.4	S150-07/08, S160-07/08, S170-07/08
1810.3.10	1810.8	S54-06/07, S160-07/08
1810.3.10.1	1810.8.1	S54-06/07, S160-07/08
1810.3.10.2	1810.8.2	S54-06/07, S150-07/08, S160-07/08
1810.3.10.3	1810.8.4	S54-06/07, S160-07/08
1810.3.10.4	1810.8.4.1	S54-06/07, S160-07/08
1810.3.11	1808.2.4	S160-07/08
1810.3.11.1	1808.2.23.1.1	S60-07/08, S160-07/08 1266)
1810.3.11.2	1808.2.23.2.2, 1808.2.23.2.3	S60-07/08, S160-07/08
1810.3.12 (New)		S160-07/08, S172-07/08
1810.3.13	1808.2.23.1	S51-06/07, S153-07/08, S160-07/08
Deleted	1810.4	S160-07/08
1810.4 (New)		S160-07/08
Deleted	1810.4.1	S160-07/08
1810.4.1	1808.2.6	S160-07/08
1810.4.1.1	1809.2.2.4	S152-07/08, S160-07/08
1810.4.1.2 (New)		S160-07/08
1810.4.1.3	1810.4.3	S160-07/08
1810.4.1.4	1810.5.3	S160-07/08
1810.4.1.5	1809.1.3	S160-07/08
(Deleted)	1810.4.2	S160-07/08
1810.4.2	1808.2.20	S160-07/08
1810.4.3	1808.2.21	S160-07/08
(Deleted)	1810.4.4	S150-07/08
1810.4.4	1808.2.13	S160-07/08
1810.4.5	1808.2.15	S160-07/08
1810.4.6	1808.2.19	S160-07/08
1810.4.7	1810.2.3	S160-07/08
1810.4.8	1810.3.3	S160-07/08
1810.4.9	1810.7.6	S150-07/08, S160-07/08

2009 IBC	2006 IBC	CODE CHANGE NUMBER(S)
1810.4.10	1810.8.5	S54-06/07, S160-07/08
1810.4.11 (New)		S171-07/08
1810.4.12	1808.2.22	S160-07/08
Deleted	1810.5	S160-07/08
Deleted	1810.5.4	S150-07/08, S160-07/08
Deleted	1810.6	S160-07/08
Deleted	1810.6.1	S160-07/08
Deleted	1810.6.2	S160-07/08
Deleted	1810.6.4	S150-07/08, S160-07/08
Deleted	1810.6.4.1	S160-07/08
Deleted	1810.6.5	S150-07/08
Deleted	1810.7	S160-07/08
Deleted	1810.7.5	S160-07/08
Deleted	1810.8.3	S160-07/08
Deleted	1811	S160-07/08
Deleted	1811.1	S160-07/08
Deleted	1811.2	S160-07/08
Deleted	1811.3	S160-07/08
Deleted	1811.4	S160-07/08
Deleted	1811.5	S160-07/08
Deleted	1812	S160-07/08
Deleted	1812.1	S160-07/08
Deleted	1812.2	S160-07/08
Deleted	1812.3	S150-07/08, S160-07/08
Deleted	1812.5	S150-07/08, S160-07/08
Deleted	1812.8	S160-07/08
Deleted	1812.9	S160-07/08
Deleted	1812.10	S150-07/08, S160-07/08

CHAPTER 19
CONCRETE

2009 IBC	2006 IBC	CODE CHANGE NUMBER(S)
1901.4		CCC
1902.1		CCC
1904.2 (New)		S172-07/08
Deleted	1904.3	S172-07/08
1904.3	1904.2.2	S35-06/07, S172-07/08
Deleted	1904.4	S172-07/08
1904.4	1904.2	S172-07/08
1904.4.1	1904.2.1	S172-07/08
1904.4.2	1904.2.2	S172-07/08

CODE CHANGES RESOURCE COLLECTION - INTERNATIONAL BUILDING CODE

CHAPTER 19 (continued)

CHAPTER 21 (continued)

2009 IBC	2006 IBC	CODE CHANGE NUMBER(S)
1904.5 (New)		S172-07/08
1907.7 through 1907.7.4		S172-07/08
1907.7.5 (New)		S172-07/08
1908.1		S172-07/08
Deleted	1908.1.1	S172-07/08
1908.1.1	1908.1.3	S172-07/08
Deleted	1908.1.2	S172-07/08
1908.1.2	1908.1.4	S172-07/08
1908.1.3	1908.1.13	S172-07/08
1908.1.4	1908.1.8	S172-07/08
Deleted	1908.1.5	S172-07/08
1908.1.5	1908.1.9	S172-07/08
Deleted	1908.1.6	S172-07/08
1908.1.6	1908.1.10	S172-07/08
Deleted	1908.1.7	S172-07/08
1908.1.9	1908.1.16	S56-06/07, S172-07/08, S173-07/08
1908.1.10 (New)		S172-07/08
Deleted	1908.1.11	S172-07/08
Deleted	1908.1.12	S172-07/08
1909.4		S35-06/07
1909.6.1		S172-07/08
1909.6.3		S172-07/08
1912.1		S172-07/08
1915.5		G6-06/07, G81-06/07, S35-06/07, G13-07/08

**CHAPTER 21
MASONRY**

2009 IBC	2006 IBC	CODE CHANGE NUMBER(S)
2102		FS85-07/08
2101.2.2		S24-06/07, S174-07/08, S175-07/08, S176-07/08
2101.2.3		S174-07/08, S175-07/08, S176-07/08
2101.2.4		S174-07/08, S175-07/08, S176-07/08
2101.2.5		S174-07/08, S175-07/08, S176-07/08
2101.2.5.1 (New)		S190-07/08

2009 IBC	2006 IBC	CODE CHANGE NUMBER(S)
2101.2.6		S174-07/08, S175-07/08, S176-07/08
2101.3		S175-07/08, S176-07/08
2101.3.1		S57-06/07
2102		S175-07/08
2103.2		FS10-06/07, S177-07/08
2103.8		S175-07/08, S177-07/08, S178-07/08
Deleted	Tables 2103.8(1) & (2)	S175-07/08
2103.11		S175-07/08
Deleted	2103.11.1	S175-07/08
2103.12		S175-07/08
Deleted	Table 2103.12	S175-07/08, S180-07/08
2103.13		S175-07/08
Deleted	2103.13.1 through 2103.13.8	S175-07/08
2104.1		S174-07/08, S175-07/08
2104.1.1		S174-07/08, S175-07/08
2104.1.2		S174-07/08, S175-07/08
Deleted	2104.1.2.1 through 2104.1.2.7	S175-07/08
2104.1.3		S175-07/08
2104.1.5		S175-07/08
Deleted	2104.1.7	S175-07/08
Deleted	2104.1.8	S175-07/08
2104.2		S175-07/08
2104.3		S174-07/08, S175-07/08
Deleted	2104.3.1 through 2104.3.3.5	S175-07/08
2104.4		S174-07/08, S175-07/08
Deleted	2104.4.1 through 2104.5	S175-07/08
2105.2.2.1.1		S175-07/08, S180-07/08, S185-07/08
Table 2105.2.2.1.1		S175-07/08
2105.2.2.1.2		S175-07/08, S180-07/08, S185-07/08
2105.2.2.1.3		S175-07/08, S180-07/08, S185-07/08

CHAPTER 21 (continued)

**CHAPTER 22
STEEL**

2009 IBC	2006 IBC	CODE CHANGE NUMBER(S)
2106.1		S174-07/08, S175-07/08
Deleted	2106.1.1 through 2106.6	S174-07/08, S175-07/08
2107.1		S174-07/08, S175-07/08
2107.2		S174-07/08, S175-07/08
Deleted	2107.3	S174-07/08, S175-07/08
Deleted	2107.4	S174-07/08, S175-07/08, S188-07/08
2107.3	2107.5	S174-07/08, S175-07/08
2107.4	2107.6	S174-07/08, S175-07/08
2107.5	2107.7	S174-07/08, S175-07/08
Deleted	2107.8	S175-07/08
2108.1		S174-07/08, S175-07/08
2108.2		S174-07/08, S175-07/08
2108.3		S174-07/08, S175-07/08
Deleted	2108.4	S175-07/08
2109.1, 2109.1.1		S174-07/08, S175-07/08
Deleted	2109.2 through 2109.2.2	S175-07/08
2109.2	2109.2.3	S175-07/08
2109.2.1	2109.2.3.21	S175-07/08
Table 2109.2.1	Table 2109.2.3.1	S175-07/08
2109.2.2	2109.2.3.1	S175-07/08
Deleted	2109.3 through 2109.7.4	S175-07/08
2109.3 through	2109.8 through	
2109.3.4.7	2109.8.4.7	S175-07/08
2110.1, 2110.1.1		S175-07/08
Deleted	2110.2 through 2110.7	S175-07/08
2111.3		S193-07/08
2111.4		S193-07/08
2111.8		S194-07/08
2111.13.3		G13-07/08
2113.3		S193-07/08
2113.4		S193-07/08
2113.11.1		S198-07/08

2009 IBC	2006 IBC	CODE CHANGE NUMBER(S)
2203.1		S201-07/08, S202-07/08
2203.2		S201-07/08, S202-07/08, S204-07/08
2206.1		S204-07/08
2206.5		S204-07/08
2208.1		S205-07/08
2209.1		S155-07/08, S206-07/08
2209.2 (New)		S207-07/08, CCC
2209.2.1	2209.2	S207-07/08, CCC
2209.2.2 (New)		S207-07/08, CCC
2209.2.2.1 (New)		S207-07/08
2209.2.3 (New)		S207-07/08
2210 (Title)		S155-07/08
2210.1		S208-07/08
2210.2		S208-07/08
2210.3.1 through 2210.3.5 (New)		S209-07/08
2210.4		S208-07/08
2210.5 (New)		S208-07/08
2210.6	2210.5	S208-07/08
2210.7	2210.6	S208-07/08

**CHAPTER 23
WOOD**

2009 IBC	2006 IBC	CODE CHANGE NUMBER(S)
2301.2		RB33-06/07
2302.1		S64-06/07, S65-06/07, S155-07/08
2303.1.3		CCC
2303.2		FS11-06/07, S214-07/08
2303.2.1 (New)		S214-07/08
2303.2.2 (New)		S214-07/08
2303.2.3 (New)		S214-07/08
Deleted	2303.4.1.1	S66-06/07
2303.4.1.1	2303.4.1.2	S66-06/07, S216-07/08
2303.4.1.2	2303.4.1.5	S66-06/07, S216-07/08
2303.4.1.3 (New)		S216-07/08
2303.4.1.4	2303.4.1.1	S216-07/08
2303.4.2	2303.4.1.3	S216-07/08, S217-07/08
2303.4.3	2304.1.4	S216-07/08

CODE CHANGES RESOURCE COLLECTION - INTERNATIONAL BUILDING CODE

CHAPTER 23 (continued)

CHAPTER 23 (continued)

2009 IBC	2006 IBC	CODE CHANGE NUMBER(S)	2009 IBC	2006 IBC	CODE CHANGE NUMBER(S)
2303.4.4	2303.4.1.6	S66-06/07, S216-07/08	2306.1		S83-06/07, CCC
2303.4.5	2303.4.1.7	S66-06/07, S216-07/08	Deleted	2306.2	S83-06/07
2303.4.6	2303.4.2	S66-06/07, S68-06/07, S216-07/08	Deleted	2306.2.1	S83-06/07
2303.4.7 (New)		S216-07/08	Deleted	Table 2306.2.1	S83-06/07
2304.6.1		S69-06/07, S70-06/07	2306.2.1	2306.3.1	S83-06/07
Table 2304.6.1 (New)		S70-06/07	Table 2306.2.1(1) ... Table 2306.3.1		S72-06/07, S83-06/07, S95-06/07, S97-06/07
Table 2304.7(3)		S72-06/07	Table 2306.2.1(1) ... Table 2306.3.2		S87-06/07, S222-07/08
2304.8.1		S73-06/07	Deleted	2306.3.2 through Table 2306.3.3	S83-06/07
2304.8.2 through 2304.8.2.5		S73-06/07	2306.2.2	2306.3.4	S83-06/07
2304.8.3.2		S73-06/07	2306.2.3	2306.3.5	S83-06/07
2304.8.4.1		S73-06/07	2306.2.4	2306.3.6	S83-06/07
2304.8.5.1		S73-06/07	Deleted	2306.4	S83-06/07
2304.8.5.2		S73-06/07	2306.3	2306.4.1	S83-06/07
2304.8.5.3		S73-06/07	Table 2306.3	Table 2306.4.1	S72-06/07, S83-06/07, S95-06/07, S97-06/07
Table 2304.9.1		S74-06/07, S75-06/07	2306.4	2306.4.2	S83-06/07, S140-07/08
2304.9.5		S76-06/07, S219-07/08	2306.5	2306.4.3	S83-06/07, S140-07/08
2304.9.5.1 (New)		S76-06/07, S218-07/08, S219-07/08	2306.6	2306.4.4	S83-06/07, S140-07/08
2304.9.5.2 (New)		S76-06/07, S154-07/08, S219-07/08	Table 2306.6	Table 2306.4.4	S83-06/07, S117-06/07
2304.9.5.3 (New)		S76-06/07, S219-07/08	2306.7	2306.4.5	S83-06/07, S140-07/08
2304.9.5.4 (New)		S76-06/07, S219-07/08	Table 2306.7	Table 2306.4.5	S83-06/07, S98-06/07
2304.11.2.1		S221-07/08	Deleted	2306.4.5.1 through 2306.4.5.1.7	S83-06/07
2304.11.2.5		S81-06/07	2307.1		S99-06/07
2305.1		S82-06/07	2307.1.1		S97-06/07
Deleted	2305.1.1	S82-06/07	2308.1		CCC
Deleted	2305.1.2	S82-06/07	2308.2		S100-06/07, S101-06/07
Deleted	2305.1.2.1	S82-06/07	2308.2.1		S79-07/08
2305.1.1	2305.1.3	S57-06/07, S82-06/07	2308.3.2		S224-07/08
Deleted	2305.1.4 through 2305.2.1	S82-06/07	2308.3.3		S35-06/07
2305.2	2305.2.2	S82-06/07	2308.6		S90-06/07
Table 2305.2(1)	Table 2305.2.2(1)	S82-06/07, CCC	2308.9.1		S227-07/08
Deleted	2305.2.3 through 2305.3.1	S82-06/07	2308.9.3		S72-06/07
2305.3	2305.3.2	S82-06/07	Table 2308.9.3(3)		S72-06/07
Deleted	2305.3.3 through 2305.3.11	S82-06/07, S90-06/07	2308.10.1		S221-07/08
			2308.11.1		S35-06/07

CHAPTER 23 (continued)

2009 IBC	2006 IBC	CODE CHANGE NUMBER(S)
2308.11.2		S102-06/07, G13-07/08, S229-07/08
2308.12.1		S35-06/07
2308.12.2		S102-06/07, G13-07/08
2308.12.8		S90-06/07
2308.12.9		S90-06/07

**CHAPTER 24
GLASS AND GLAZING**

2009 IBC	2006 IBC	CODE CHANGE NUMBER(S)
2406.1.1		S105-06/07
2406.2 (New)		S105-06/07
Table 2406.2(1)	Table 2406.1	S105-07/08
Table 2406.2(2) (New)		S105-06/07
2406.3.1	2406.2.1	S106-06/07, CCC
2407.1		S106-06/07
2407.1.2		S108-06/07
2407.1.4 through 2407.1.4.2 (New)		S230-07/08
2408.2.1		S106-06/07
2408.3		S106-06/07
2409.1		S231-07/08
2409.1.1 through 2409.3.2 (New)		S231-07/08

**CHAPTER 25
GYPSUM BOARD AND PLASTER**

2009 IBC	2006 IBC	CODE CHANGE NUMBER(S)
Table 2506.2		S110-06/07, S232-07/08
2509.2		S112-06/07
Table 2511.1.1		S113-06/07
2512.1		S114-06/07
2512.2		S113-06/07
Table 2512.6		S113-06/07
2513.3		S113-06/07

**CHAPTER 26
PLASTIC**

2009 IBC	2006 IBC	CODE CHANGE NUMBER(S)
2602		FS196-07/08
2603.3		FS11-06/07

CHAPTER 26 (continued)

2009 IBC	2006 IBC	CODE CHANGE NUMBER(S)
2603.4		FS10-06/07
2603.4.1.2		FS163-07/08
2603.4.1.13		FS11-06/07
2603.5.1		FS10-06/07
2603.5.4		FS11-06/07
2603.8		FS43-06/07
2604.2.3		F121-07/08
2604.2.4		FS11-06/07
2605.2		FS192-07/08
2605.3 (New)		FS192-07/08
2606.4		FS11-06/07, FS216-06/07
2606.7		FS194-07/08
2606.12		G6-06/07
2612 (New)		FS196-07/08
2613 (New)		FS149-07/08

**CHAPTER 27
ELECTRICAL**

2009 IBC	2006 IBC	CODE CHANGE NUMBER(S)
2701.1		CCC

**CHAPTER 29
PLUMBING SYSTEMS**

2009 IBC	2006 IBC	CODE CHANGE NUMBER(S)
Table 2902.1		P24-06/07 P25-06/07 640), CCC, G106-07/08, P15-07/08, P16-07/08, P17-07/08, CCC
2902.1.1 (New)		P32-06/07
2902.1.2	2902.1.1	E185-06/07, P28-06/07, P22-07/08
Deleted	2902.3	P32-06/07
2902.3	2902.4	P26-07/08
2902.3.1 (New)		P26-07/08, CCC
2902.4 (New)		G184-07/08
2902.4.1 (New)		CCC
2903 (New)		CCC
2903.1 (New)		G185-07/08 P10-07/08, CCC
2903.2 (New)		G184-07/08, CCC
2902.6.1	2902.5.1	P34-06/07, CCC

**CHAPTER 30
ELEVATORS AND CONVEYING SYSTEMS**

2009 IBC	2006 IBC	CODE CHANGE NUMBER(S)
3002.3		E14-07/08
3002.4		G188-07/08
3002.7		G182-06/07
3004.1		G189-07/08
3004.2		FS59-06/07
3004.3		G183-06/07, G190-07/08
3006.4		FS37-06/07, G187-06/07, G188-06/07, CCC
3006.5		Editorial per NFPA 72
3007 (New)		G63-06/07
3007.1 (New)		G63-06/07
3007.2 (New)		G63-06/07
3007.3 (New)		G195-07/08
3007.4 (New)		G63-06/07
3007.4.1 (New)		G63-06/07
3007.4.2 (New)		G63-06/07
3007.4.3 (New)		G63-06/07
		G196-07/08
3007.4.4 (New)		G197-07/08
3007.5 (New)		G63-06/07
3007.6 (New)		G63-06/07,
3007.7 (New)		G63-06/07
		G195-07/08
3007.7.1 (New)		G63-06/07
3008 (New)		E14-07/08

**CHAPTER 31
SPECIAL CONSTRUCTION**

2009 IBC	2006 IBC	CODE CHANGE NUMBER(S)
3101.1		G201-07/08
3102.1		F241-07/08
3102.2		G189-06/07
3104.5		FS37-06/07, G190-06/07, G191-06/07
3105.4		FS11-06/07
3108.1		S15-06/07, G226-07/08
3108.2		S15-06/07
Deleted	3108.3	S15-06/07
Deleted	3108.4	S15-06/07
Deleted	3108.4.1	S15-06/07
Deleted	3108.4.2	S15-06/07
Deleted	3108.5	S15-06/07
3109.4.1.7		RB314-06/07

CHAPTER 31 (continued)

2009 IBC	2006 IBC	CODE CHANGE NUMBER(S)
3109.4.1.8		G4-06/07, RB315-06/07, E160-07/08
3109.5		RB227-07/08
3110 (New)		G201-07/08

**CHAPTER 32
ENCROACHMENTS INTO THE
PUBLIC RIGHT OF WAY**

2009 IBC	2006 IBC	CODE CHANGE NUMBER(S)
3202.1.2		G4-06/07
3202.3.4		G4-06/07
3202.4		G4-06/07

**CHAPTER 33
SAFEGUARDS DURING CONSTRUCTION**

2009 IBC	2006 IBC	CODE CHANGE NUMBER(S)
3303.6		G4-06/07
3304.1.4		S146-07/08
3306.2		G4-06/07
3306.7		G6-06/07
3308.1		G4-06/07
3310.1		G48-07/08, CCC
3311.1		F141-06/07

**CHAPTER 34
EXISTING STRUCTURES**

2009 IBC	2006 IBC	CODE CHANGE NUMBER(S)
3401.3		CCC
3401.4 (New)		G203-07/08
3401.4.1 (New)		G203-07/08, CCC
3401.4.2 (New)		G203-07/08
3401.5 (New)		G204-07/08
3402		G205-07/08, G206-07/08
Deleted	3403	G203-07/08
3403 (New)		G203-07/08, CCC
3403.2 (New)		G203-07/08, G208-07/08, CCC
3403.3 (New)		G203-07/08, CCC
3403.4 (New)		G203-07/08, G209-07/08, G210-07/08, CCC

CHAPTER 34 (continued)

CHAPTER 34 (continued)

2009 IBC	2006 IBC	CODE CHANGE NUMBER(S)
3403.4.1 (New)		G209-07/08, CCC
3403.5 (New)		G203-07/08, G209-07/08, G210-07/08, CCC
3404 (New)		G203-07/08, CCC
3404.2		G203-07/08, G208-07/08, CCC
3404.4.1		CCC
3404.6 (New)		E19-07/08
3405 (New)		G203-07/08, CCC
3405.1 (New)		G203-07/08, G206-07/08, CCC
3405.1.1 (New)		G206-07/08, CCC
3405.2 (New)		G206-07/08, CCC
3405.3 (New)		G206-07/08
3405.4 (New)		G206-07/08
3405.5 (New)		G203-07/08, G206-07/08, G208-07/08, G211-07/08, CCC
3408.4	3406.4	G203-07/08, G209-07/08, G210-07/08
3411.1	3409.1	G206-06/07, G203-07/08
3411.4 (New)		G199-06/07, G203-06/07
3411.4.1 (New)		G203-06/07
3411.4.2 (New)		G203-06/07
3411.6	3409.6	G206-06/07, G215-07/08
3411.8.4	3409.8.4	G208-06/07
3411.8.7	3409.8.7	G206-06/07, G209-06/07, G215-07/08
3411.8.8 (New)		G215-07/08
3411.8.9 (New)		G215-07/08
3411.8.11	3409.8.9	E185-06/07
Deleted	3409.8.11	G210-06/07
3411.8.13 (New)		G211-06/07
3411.9	3409.9	G4-06/07
3411.9.4	3409.9.4	E185-06/07, G203-07/08
3412.2.5	3410.2.5	G214-06/07
3412.4.1	3410.4.1	G203-07/08, G216-07/08
3412.6.1.1	3410.6.1.1	G9-06/07
3412.6.2	3410.6.2	G218-07/08
3412.6.2.1	3410.6.2.1	G218-07/08
3412.6.2.2	3410.6.2.2	G9-06/07
3412.6.4.1	3410.6.4.1	G9-06/07

2009 IBC	2006 IBC	CODE CHANGE NUMBER(S)
3412.6.6	3410.6.6	G203-07/08, G219-07/08
3412.6.8.1	3410.6.8.1	G9-06/07
3412.6.10.1	3410.6.10.1	G9-06/07
3412.6.11	3410.6.11	E19-07/08
Table 3412.6.11(1) (new)		E19-07/08
Table 3412.6.11(2)	Table 3410.6.11	G6-06/07, E19-07/08
3412.6.16.1	3410.6.16.1	FS37-06/07
3412.6.18 (New)		G213-06/07
Table 3412.6.18(1) (New)		G213-06/07
3412.6.18.1 (New)		G213-06/07
3412.6.19	3410.6.18	G9-06/07, G131-06/07, CCC
Table 3412.6.19	Table 3410.6.18	G131-06/07, CCC
Table 3412.7	Table 3410.7	G213-06/07, CCC

CHAPTER 35
REFERENCED STANDARDS

AA	S115-06/07, S238-07/08
AAMA	S238-07/08
ACI	FS198-07/08, S172-07/08, S174-07/08, S175-07/08, S176-07/08, S178-07/08, S180-07/08
AF&PA	S154-07/08, S236-07/08
AISC	S137-07/08
AISI	S208-07/08, S238-07/08
AITC	S238-07/08
ANSI	S105-06/07
ANSI/APSP	RB227-07/08
APA	S115-06/07
ASCE/SEI	S174-07/08, S175-07/08, S176-07/08, S178-07/08, S180-07/08, S235-07/08
ASTM	FS191-06/07, FS217-06/07, G56-06/07, G224-06/07, E84-06/07, S110-06/07, S115-06/07, FS164-07/08, FS167-07/08, FS175-07/08, FS198-07/08, G201-07/08, S33-07/08, S34-07/08, S37-07/08, S137-07/08, S177-07/08, S232-07/08, S238-07/08
AWPA	S115-06/07, S238-07/08
AWS	S137-07/08
BHMA	E164-06/07, E171-07/08
DASMA	S20-06/07, FS198-07/08, S238-07/08
DOC	S115-06/07, S238-07/08
EUROPEAN STANDARD	F233-07/08
FM	FS198-07/08, S9-07/08
GA	FS198-07/08, S238-07/08
HPVA	S115-06/07
ICC	E163-06/07, RB33-06/07, G109-07/08, S79-07/08
GA	FS217-06/07
NEMA	G63-06/07

CHAPTER 35 (continued)

NFPA..... FS217-06/07, G87-06/07, G224-06/07,
E164-06/07, S23-06/07, FS198-07/08, G82-07/08,
G100-07/08, E147-07/08

PTI..... S238-07/08

RMI/ANSI S205-07/08

SDI S207-07/08

SJI S204-07/08

SPRI S238-07/08

TIA..... S238-07/08

TMS..... G180-07/08, S174-07/08, S175-07/08,
S176-07/08, S178-07/08, S180-07/08, S238-07/08

TPI..... S238-07/08

UL..... FS10-06/07, FS11-06/07,
FS102-06/07, FS143-06/07, FS166-06/07, FS217-06/07,
G80-06/07, G89-06/07, E82-06/07, E83-06/07, E84-06/07,
S115-06/07, FS198-07/08, G201-07/08,
E54-07/08, S238-07/08

WDMA S238-07/08

APPENDIX J

J101.1..... S146-07/08

J104.3..... S146-07/08

J106.1..... S146-07/08 (p.

J107.1..... S146-07/08

J107.6..... S146-07/08

APPENDIX K

Appendix KG220-06/07 282)

APPENDICES

2009 IBC	2006 IBC	CODE CHANGE NUMBER(S)
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APPENDIX A

A101.2..... CCC

APPENDIX D

D102.2.8..... FS11-06/07 19)

D106..... FS11-06/07 19)

APPENDIX G

G102.1.....G217-06/07 278),
G218-06/07 279)

G102.2.....G4-06/07 172)

G201.2.....G217-06/07 278)

G401.2.....G219-06/07 281)

G901 (New)G217-06/07 278)

G901.6..... CCC

G902 (New)G218-06/07 279)

APPENDIX H

H106.2..... CCC

2006/2007 DOCUMENTATION



IBC – FIRE SAFETY

Code Change No: **FS1-06/07**

Original Proposal

Section: 701.1

Proponent: Bill McHugh, Firestop Contractors International Association

Revise as follows:

701.1 Scope. The provisions of this chapter shall govern the materials and systems assemblies used for structural fire resistance and fire-resistance-rated construction separation of adjacent spaces to safeguard against the spread of fire and smoke within a building and the spread of fire to or from buildings through compartmentation systems.

Reason: The purpose of this code change is to bring the concept of systems and compartmentation into this area of the code. Each component of compartmentation features and structural protection are tested and listed as a total system. The wall, floor, penetrating item (duct, damper, door, glass,) and the materials used are tested and listed as a system.

The code should state that these are systems which points to tested and listed assemblies, rather than simply assemblies. Assemblies alone could be non tested assemblies. Additionally, the scope of this chapter is really compartmentation and structural protection, but never states compartmentation.

The code needs to state that compartmentation is the correct term for 'fire-resistance-rated construction that separates spaces inside a building and to or from the building'.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Modified

Modify proposal as follows:

701.1 Scope. The provisions of this chapter shall govern the materials, systems and ~~systems~~ assemblies used for structural fire resistance and fire-resistance-rated construction separation of adjacent spaces to safeguard against the spread of fire and smoke within a building and the spread of fire to or from buildings ~~through compartmentation systems~~.

Committee Reason: The modifications help to provide terms which are used in the field and also recognized by building officials and those conducting tests. While some items are tested as a "system" most people are familiar with the phrase "assembly" which picks up all of the items involved. This modification simply combines the two terms. The deletion at the end is because "compartmentation systems" are not defined or a commonly used term.

Assembly Action:

None

Final Hearing Results

FS1-06/07

AM

Code Change No: **FS4-06/07**

Original Proposal

Sections: 702.1, 702.3, 602.1

Proponent: Gregory R. Keith, Professional heuristic Development, representing The Boeing Company

THIS PROPOSAL IS ON THE AGENDA OF THE IBC FIRE SAFETY AND THE IBC GENERAL CODE DEVELOPMENT COMMITTEES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IBC FIRE SAFETY

1. Add new definition as follows:

702.1 Definitions. The following words and terms shall, for the purposes of this chapter, and as used elsewhere in this code, have the meanings shown herein.

BUILDING ELEMENT: A fundamental component of building construction which may or may not be of fire-resistance-rated construction and which is constructed of materials based on the building type of construction.

2. Revise as follows:

703.2 Fire-resistance ratings. The fire-resistance rating of building elements shall be determined in accordance with the test procedures set forth in ASTM E 119 or in accordance with Section 703.3. Where materials, systems or devices that have not been tested as part of a fire-resistance rated assembly are incorporated into the assembly, sufficient data shall be made available to the building official to show that the required fire-resistance rating is not reduced. ~~Materials and methods of construction used to protect joints and penetrations in fire-resistance rated building elements shall not reduce the required fire-resistance rating.~~

Exception: In determining the fire-resistance rating of exterior bearing walls, compliance with the ASTM E 119 criteria for unexposed surface temperature rise and ignition of cotton waste due to passage of flame or gases is required only for a period of time corresponding to the required fire-resistance rating of an exterior nonbearing wall with the same fire separation distance, and in a building of the same group. When the fire-resistance rating determined in accordance with this exception exceeds the fire-resistance rating determined in accordance with ASTM E 119, the fire exposure time period, water pressure, and application duration criteria for the hose stream test of ASTM E 119 shall be based upon the fire-resistance rating determined in accordance with this exception.

PART II – IBC GENERAL

Revise as follows:

602.1 General. Buildings and structures erected or to be erected, altered or extended in height or area shall be classified in one of the five construction types defined in Sections 602.2 through 602.5. The building elements shall have a fire-resistance rating not less than that specified in Table 601 and exterior walls shall have a fire-resistance rating not less than that specified in Table 602. Where required to have a fire-resistance rating by Table 601, building elements shall comply with the applicable provisions of Section 703.2. The protection of openings, penetrations, joints and ducts and air transfer openings in building elements shall not be required unless required by other provisions of this code.

Reason: The International Building Code provides a considerable level of detail for the requirements of fire-resistance-rated assemblies. Currently, only Section 602.1 provides technical charging language for the fundamental building elements listed in Table 601. There are many misunderstood details associated with the application of Table 601. Most deal with fire-resistance rated construction requirements. For example, many assume that opening protection is inherently required when Table 601 specifies that a building element be of fire-resistance rated construction. The protection of openings, however, triggers off of the requirement for a given assembly such as a fire wall, fire barrier, exterior wall, etc. This is somewhat counterintuitive for those lacking experience in the application of the provisions of the IBC. Additionally, there are those who attempt to apply fire barrier or fire partition requirements to simple building elements that are required to be of fire-resistance rated construction. Although Section 703.2 states, "The fire-resistance rating of building elements shall be determined in accordance with the test procedures set forth in ASTM E119...", that provision is often overlooked.

Accordingly, fundamental charging language has been provided to assist in the proper determination of construction requirements for basic building elements. This includes an appropriate cross reference to Section 703.2. Additionally, a general statement addressing the continuity of building elements is introduced. This proposed language is consistent with the charging language currently provided in Section 715.1, which states, "Opening protectives required by other sections of this code shall comply with the provisions of this section." It is recognized that each portion of the proposed language is currently contained in the IBC. Nevertheless, the proposed language will provide code users with a construction base line for simple building elements as opposed to formal fire-resistance rated assemblies. Additionally, it is felt that the ultimate sentence in Section 703.2 is redundant and somewhat out of context. The proposed language in Section 602.1 properly addresses the continuity issue. And perhaps most importantly, the charging provisions of Sections 712 and 713 clearly describe the continuity requirements for fire-resistance rated construction. Lastly, a definition of BUILDING ELEMENT is created. It is largely intended to raise the awareness of the term while providing for initial construction provisions.

Approval of this proposal will greatly assist design professionals and code enforcement officials in the proper application of these fundamental and essential International Building Code provisions, especially those individuals with minimal experience.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

PART I — IBC FIRE SAFETY

Committee Action:

Approved as Modified

Modify the proposal as follows:

702.1 Definitions. The following words and terms shall, for the purposes of this chapter, and as used elsewhere in this code, have the meanings shown herein.

BUILDING ELEMENT: A fundamental component of building construction, listed in Table 601, which may or may not be of fire-resistance-rated construction and which is constructed of materials based on the building type of construction.

703.2 Fire-resistance ratings. The fire-resistance rating of building elements shall be determined in accordance with the test procedures set forth in ASTM E 119 or in accordance with Section 703.3. Where materials, systems or devices that have not been tested as part of a fire-resistance rated assembly are incorporated into the assembly, sufficient data shall be made available to the building official to show that the required fire-resistance rating is not reduced. Materials and methods of construction used to protect joints and penetrations in fire-resistance rated building elements shall not reduce the required fire-resistance rating.

Exception: In determining the fire-resistance rating of exterior bearing walls, compliance with the ASTM E 119 criteria for unexposed surface temperature rise and ignition of cotton waste due to passage of flame or gases is required only for a period of time corresponding to the required fire-resistance rating of an exterior nonbearing wall with the same fire separation distance, and in a building of the same group. When the fire-resistance rating determined in accordance with this exception exceeds the fire-resistance rating determined in accordance with ASTM E 119, the fire exposure time period, water pressure, and application duration criteria for the hose stream test of ASTM E 119 shall be based upon the fire-resistance rating determined in accordance with this exception.

Committee Reason: The definition helps to explain a fundamental item and when combined with the revisions proposed to Section 602.1 will help get people started with using the code. The modification to keep the existing text in Section 703.2 will help make it clear that the ratings are not to be reduced. Adding the reference to Table 601 in the definition helps clarify that the "building elements" are only those items listed in the table.

Assembly Action:

None

PART II — IBC GENERAL

Committee Action:

Approved as Modified

Modify proposal as follows:

602.1 General. Buildings and structures erected or to be erected, altered or extended in height or area shall be classified in one of the five construction types defined in Sections 602.2 through 602.5. The building elements shall have a fire-resistance rating not less than that specified in Table 601 and exterior walls shall have a fire-resistance rating not less than that specified in Table 602. Where required to have a fire-resistance rating by Table 601, building elements shall comply with the applicable provisions of Section 703.2. The protection of openings, ~~penetrations, joints and~~ ducts and air transfer openings in building elements shall not be required unless required by other provisions of this code.

Committee Reason: The committee felt that these two sentences provided a benefit to the code user as opening protection is not always required. The modification addresses the fact that penetration protection and fire resistant joints systems are generally required for fire resistive construction whereas openings, ducts and air transfer may not require any special protection.

Assembly Action:

None

Final Hearing Results

FS4-06/07, Part I	AM
FS4-06/07, Part II	AM

Code Change No: **FS7-06/07**

Original Proposal

Section: 702.1 (IFC 902.1)

Proponent: Greg Rogers, Kitsap Fire District 7, representing ICC Joint Fire Service Review Committee

Revise definition as follows:

FIRE AREA. The aggregate floor area enclosed and bounded by fire walls, fire barriers, exterior walls or fire-resistance-rated horizontal assemblies of a building. Areas of the building not provided with surrounding walls shall be included in the fire area if such areas are included within the horizontal projection of the roof or floor above.

Reason: Sprinkler and fire alarm requirements in Chapter 9 of the IBC and IFC are based on the square footage or occupant load of a fire area. It is not clear from the definition of a fire area that building areas without surrounding walls are included in the fire area. This concept is clear in the definition of building area found in IBC 502.1, "Areas of the building not provided with surrounding walls shall be included in the building area if such areas are included within the horizontal projection of the roof or floor above". This was confirmed by IFC Interpretation No. 25-05, dated 09-12-05.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: Although this issue is not clear in the existing code, placing this requirement within the definition is not the best solution and may be overlooked. The testimony discussed items such as picnic shelters, flea-markets and other items which don't have walls around them that would be affected by this requirement and now need sprinklers or alarms due to exceeding the fire area. Another example given was a canopy which was 44 feet tall and open on all sides. Items which are open and unenclosed do not create the same fire hazard and should not be regulated by the same requirements that apply to enclosed buildings.

Assembly Action:

Approved as Submitted

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because an assembly action was successful and public comments were submitted.

Public Comment 1:

Edmund Domian, West Valley City, Utah, requests Approval as Submitted.

Commenter's Reason: The real issue of this code change is not what meets the definition of "building" but what warrants a need for compartmentation. Many big box warehouse-type stores have a large attached open yard of combustible products for sale, which often meet the definition of high piled combustible storage. This "open yard" has a metal or fabric canopy overhead; the public are trapped in this area within a fenced perimeter. The fire load in these "open yards" can be substantial. Occupants must often re-enter the main building from this enclosed "open yard" to egress the building in an emergency. Such areas should be included in the calculations of any defined "FIRE AREA."

Final Hearing Results

FS7-06/07

AS

Code Change No: FS8-06/07**Original Proposal**

Sections: 702.1; IMC 506.3.10

Proponent: Bob Eugene, Underwriters Laboratories Inc.

THIS PROPOSAL IS ON THE AGENDA OF THE IBC FIRE SAFETY AND THE IMC CODE DEVELOPMENT COMMITTEES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IBC FIRE SAFETY

Revise definitions as follows:

F RATING. The time period that the through-penetration firestop system limits the spread of fire through the penetration when tested in accordance with ASTM E 814 or UL 1479.

T RATING. The time period that the penetration firestop system, including the penetrating item, limits the maximum temperature rise to 325°F (163°C) above its initial temperature through the penetration on the nonfire side when tested in accordance with ASTM E 814 or UL 1479.

THROUGH-PENETRATION FIRESTOP SYSTEM. An assemblage of specific materials or products that are designed, tested and fire-resistance rated to resist for a prescribed period of time the spread of fire through penetrations. The F and T rating criteria for penetration firestop systems shall be in accordance with ASTM E 814 or UL 1479. See definitions of “F rating” and “T rating.”

PART II – IMC

506.3.10 Grease duct enclosure. A grease duct serving a Type I hood that penetrates a ceiling, wall or floor shall be enclosed from the point of penetration to the outlet terminal. A duct shall penetrate exterior walls only at locations where unprotected openings are permitted by the *International Building Code*. Ducts shall be enclosed in accordance with the *International Building Code* requirements for shaft construction. The duct enclosure shall be sealed around the duct at the point of penetration and vented to the outside of the building through the use of weather-protected openings. Clearance from the duct to the interior surface of enclosures of combustible construction shall be not less than 18 inches (457 mm). Clearance from the duct to the interior surface of enclosures of noncombustible construction or gypsum wall board attached to noncombustible structures shall be not less than 6 inches (152 mm). The duct enclosure shall serve a single grease exhaust duct system and shall not contain any other ducts, piping, wiring or systems.

Exceptions:

1. The shaft enclosure provisions of this section shall not be required where a duct penetration is protected with a through-penetration firestop system classified in accordance with ASTM E 814 or UL 1479 and having an “F” and “T” rating equal to the fire-resistance rating of the assembly being penetrated and where the surface of the duct is continuously covered on all sides from the point at which the duct penetrates a ceiling, wall or floor to the outlet terminal with a classified and labeled material, system, method of construction or product specifically evaluated for such purpose, in accordance with ASTM E 2336. Exposed ductwrap systems shall be protected where subject to physical damage.
2. The shaft enclosure provisions of this section shall not be required where a duct penetration is protected with a through-penetration firestop system classified in accordance with ASTM E 814 or UL 1479 and having an “F” and “T” rating equal to the fire resistance rating of the assembly being penetrated and where a prefabricated grease duct enclosure assembly is protected on all sides from the point at which the duct penetrates a ceiling, wall or floor to the outlet terminal with a classified and labeled prefabricated system specifically evaluated for such purposes in accordance with UL 2221.
3. A duct enclosure shall not be required for a grease duct that penetrates only a nonfire-resistance-rated roof/ceiling assembly.

CODE CHANGES RESOURCE COLLECTION – INTERNATIONAL BUILDING CODE

Reason: (Part I) The purpose of this code change is to include reference to UL 1479 as an alternate to ASTM E 814 in the definitions Section of Chapter 7 of the International Building Code. UL 1479 is currently referenced for walls in Section 712.3.1.2; for horizontal assemblies in Section 712.4.1.1.2; and for air leakage in smoke barriers in Section 712.5.

Both Standards are referenced together in all other pertinent sections of the International Building Code and the International Residential Code. The fire testing and hose stream testing portions of these two Standards describe the same test method. The specifications for the test apparatus and test procedure are identical between the two standards. As such, identical test results would be obtained from tests conducted using each of these methods.

The inclusion of this alternate test method would provide the authority having jurisdiction with the flexibility to accept listed and labeled products evaluated in accordance with ASTM E 814 or UL 1479.

UL 1479 is an ANSI approved standard. UL 1479 requirements cover through-penetration firestops of various materials and construction that are intended for use in openings in fire resistive wall or floor-ceiling assemblies, or both.

(Part II) The purpose of this code change is to include reference to UL 1479 as an alternate to ASTM E 814 in the International Mechanical Code.

Both Standards are referenced together in all other pertinent sections of the International Building Code and the International Residential Code. The fire testing and hose stream testing portions of these two Standards describe the same test method. The specifications for the test apparatus and test procedure are identical between the two standards. As such, identical test results would be obtained from tests conducted using each of these methods.

The inclusion of this alternate test method would provide the authority having jurisdiction with the flexibility to accept listed and labeled products evaluated in accordance with ASTM E 814 or UL 1479.

UL 1479 is an ANSI approved standard. UL 1479 requirements cover through-penetration firestops of various materials and construction that are intended for use in openings in fire resistive wall or floor-ceiling assemblies, or both.

Cost Impact: The code change proposal will not increase cost of construction.

Public Hearing Results

Note: The following analysis was not in the Code Change Proposal book but was published in the “Errata to the 2006/2007 Proposed Changes to the International Codes and Analysis of Proposed Referenced Standards” provided at the code development hearings:

Analysis: Review of proposed new standard indicated that, in the opinion of staff, the standard did comply with ICC standards criteria

PART I — IBC

Committee Action:

Approved as Submitted

Committee Reason: The addition of this standard provides an alternative means of demonstrating compliance with the code. Having an additional option provides flexibility and additional design options. UL 1479 is already used in the code in Section 712 and the standard addresses air leakage while the current referenced standard does not.

Assembly Action:

None

PART II — IMC

Committee Action:

Approved as Submitted

Committee Reason: The proposed change provides more flexibility for approving firestop material by adding another nationally recognized standard.

Assembly Action:

None

Final Hearing Results

FS8-06/07, Part I
FS8-06/07, Part II

AS
AS

Code Change No: **FS9-06/07**

Original Proposal

Sections: 703.2, 703.3, 720.1

Proponent: Gregory R. Keith, Professional heuristic Development, representing The Boeing Company

1. Revise as follows:

703.2 Fire-resistance ratings. The fire-resistance rating of building elements, components or assemblies shall be determined in accordance with the test procedures set forth in ASTM E 119 or in accordance with Section 703.3. Where materials, systems or devices that have not been tested as part of a fire-resistance-rated assembly are incorporated into the building element, component or assembly, sufficient data shall be made available to the building official to show that the required fire-resistance rating is not reduced. Materials and methods of construction used to protect joints and penetrations in fire-resistance-rated building elements, components or assemblies shall not reduce the required fire-resistance rating.

Exception: In determining the fire-resistance rating of exterior bearing walls, compliance with the ASTM E 119 criteria for unexposed surface temperature rise and ignition of cotton waste due to passage of flame or gases is required only for a period of time corresponding to the required fire-resistance rating of an exterior nonbearing wall with the same fire separation distance, and in a building of the same group. When the fire-resistance rating determined in accordance with this exception exceeds the fire-resistance rating determined in accordance with ASTM E 119, the fire exposure time period, water pressure, and application duration criteria for the hose stream test of ASTM E 119 shall be based upon the fire-resistance rating determined in accordance with this exception.

2. Revise as follows:

703.3 Alternative methods for determining fire resistance. The application of any of the alternative methods listed in this section shall be based on the fire exposure and acceptance criteria specified in ASTM E 119. The required fire resistance of a building element, component or assemblies shall be permitted to be established by any of the following methods or procedures:

- ~~1.~~ ~~Fire-resistance designs documented in approved sources.~~
- ~~2.~~ 1. Prescriptive designs of fire-resistance-rated building elements, component or assemblies as prescribed in Section 720.
- ~~3.~~ 2. Calculations in accordance with Section 721.
3. ~~Fire-resistance designs documented in approved sources.~~
4. Engineering analysis based on a comparison of building element, component or assemblies designs having fire-resistance ratings as determined by the test procedures set forth in ASTM E 119.
5. Alternative protection methods as allowed by Section 104.11.

3. Revise as follows:

720.1 General. The provisions of this section contain prescriptive details of fire-resistance-rated building elements, component or assemblies. The materials of construction listed in Tables 720.1(1), 720.1(2), and 720.1(3) shall be assumed to have the fire-resistance ratings prescribed therein. Where materials that change the capacity for heat dissipation are incorporated into a fire-resistance-rated assembly, fire test results or other substantiating data shall be made available to the building official to show that the required fire-resistance-rating time period is not reduced.

Reason: Section 703.2 is the genesis for the determination of fire-resistance ratings. The definition of "FIRE-RESISTANCE RATING" in Section 702 properly identifies that fire-resistance ratings apply to building elements, components and assemblies. Unfortunately, that level of detail is lost in several key charging provisions in the IBC. This proposal corrects that situation for a very important reason. For legal and technical reasons it is imperative that the construction component system be formalized so as to recognize and support the notion that there are fundamental building element fire-resistance rating requirements in Chapter 6 which are potentially modified through component and assembly provisions in Chapter 7. Additionally, this clarification will assist code users in the proper application of these fundamental provisions. Towards the goal of user friendliness, the five alternative methods for determining fire resistance in Section 703.3 have been editorially shuffled to reflect the typical order of progression used in the application of alternate methods. Those prescriptive procedures internal to the IBC are now listed first and followed by methods normally requiring external expertise.

Approval of this proposal will improve the technical accuracy of the International Building Code and in doing so will contribute to the proper interpretation and application of these key provisions.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The proposal provides consistency between the three terms in both the definition of fire-resistance rating and also within the various code sections. The reorganization of the items in Section 703.3 start with the prescriptive elements and then move on to the calculation and performance options which is appropriate for a prescriptive code.

Assembly Action:

None

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Bob Eugene, Underwriters Laboratories, Inc., requests Approval as Modified by this public comment.

Modify proposal as follows:

703.3 Alternative methods for determining fire resistance. The application of any of the alternative methods listed in this section shall be based on the fire exposure and acceptance criteria specified in ASTM E 119. The required fire resistance of a building element, component or assemblies shall be permitted to be established by any of the following methods or procedures:

1. Fire-resistance designs documented in approved sources.
2. ~~4.~~ Prescriptive designs of fire-resistance-rated building elements, component or assemblies as prescribed in Section 720.
3. ~~2.~~ Calculations in accordance with Section 721.
3. ~~Fire-resistance designs documented in approved sources.~~
4. Engineering analysis based on a comparison of building element, component or assemblies designs having fire-resistance ratings as determined by the test procedures set forth in ASTM E 119.
5. Alternative protection methods as allowed by Section 104.11.

(Portions of proposal not shown remain unchanged)

Commenter's Reason: This modification to the committee action re-establishes the original published order of the five alternative methods for determining fire resistance. This modification does not make any substantive change to the text. The original published order reflects the order of Chapter 7. The first method should be fire-resistant designs documented in approved sources. These designs are typically based on testing to the performance level of ASTM E119 (UL 263). In following the guidance established in 703.2, the fire-resistance rating shall be established by ASTM E119 (UL 263) or the alternative methods in Section 703.3. Those methods reflecting conformance to the ASTM E119 (UL 263) test should be listed first as originally published.

Final Hearing Results

FS9-06/07

AMPC1

Code Change No: **FS10-06/07**

Original Proposal

Sections: 410.3.5.2, 703.2, 703.2.1, 703.2.3, 703.3, 704.7, 704.9, 706.2.1, 706.7, 711.3.2, 712.3.1, 712.4.1.1, 713.1, 713.4, 714.7, 715.2, 716.5.2 (IMC 607.5.2), 716.5.3 (IMC 607.5.5), 716.6.1 (IMC 607.6.1), 716.6.2 (IMC 607.6.2.1), Table 720.1(1), 1407.10.2, 2103.2, 2603.4, 2603.5.1, Chapter 35 (IMC Chapter 15); IRC R314.1.2, Chapter 43 (New)

Proponent: Bob Eugene, Underwriters Laboratories Inc.

THIS PROPOSAL IS ON THE AGENDA OF THE IBC FIRE SAFETY, GENERAL AND STRUCTURAL AND THE IRC BUILDING/ENERGY CODE DEVELOPMENT COMMITTEES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IBC FIRE SAFETY

Revise as follows:

703.2 Fire-resistance ratings. The fire-resistance rating of building elements shall be determined in accordance with the test procedures set forth in ASTM E 119 or UL 263, or in accordance with Section 703.3. Where materials, systems or devices that have not been tested as part of a fire-resistance-rated assembly are incorporated into the assembly, sufficient data shall be made available to the building official to show that the required fire-resistance rating is not reduced. Materials and methods of construction used to protect joints and penetrations in fire-resistance-rated building elements shall not reduce the required fire-resistance rating.

Exception: In determining the fire-resistance rating of exterior bearing walls, compliance with the ASTM E 119 or UL 263 criteria for unexposed surface temperature rise and ignition of cotton waste due to passage of flame or gases is required only for a period of time corresponding to the required fire-resistance rating of an exterior nonbearing wall with the same fire separation distance, and in a building of the same group. When the fire-resistance rating determined in accordance with this exception exceeds the fire-resistance rating determined in accordance with ASTM E 119 or UL 263, the fire exposure time period, water pressure, and application duration criteria for the hose stream test of ASTM E 119 or UL 263 shall be based upon the fire-resistance rating determined in accordance with this exception.

703.2.1 Nonsymmetrical wall construction. Interior walls and partitions of nonsymmetrical construction shall be tested with both faces exposed to the furnace, and the assigned fire-resistance rating shall be the shortest duration obtained from the two tests conducted in compliance with ASTM E 119 or UL 263. When evidence is furnished to show that the wall was tested with the least fire-resistant side exposed to the furnace, subject to acceptance of the building official, the wall need not be subjected to tests from the opposite side (see Section 704.5 for exterior walls).

703.2.3 Restrained classification. Fire-resistance-rated assemblies tested under ASTM E 119 shall not be considered to be restrained unless evidence satisfactory to the building official is furnished by the registered design professional showing that the construction qualifies for a restrained classification in accordance with ASTM E 119 or UL 263. Restrained construction shall be identified on the plans.

703.3 Alternative methods for determining fire resistance. The application of any of the alternative methods listed in this section shall be based on the fire exposure and acceptance criteria specified in ASTM E 119 or UL 263. The required fire resistance of a building element shall be permitted to be established by any of the following methods or procedures:

1. Fire-resistance designs documented in approved sources.
2. Prescriptive designs of fire-resistance-rated building elements as prescribed in Section 720.
3. Calculations in accordance with Section 721.
4. Engineering analysis based on a comparison of building element designs having fire-resistance ratings as determined by the test procedures set forth in ASTM E 119 or UL 263.
5. Alternative protection methods as allowed by Section 104.11.

704.7 Unexposed surface temperature. Where protected openings are not limited by Section 704.8, the limitation on the rise of temperature on the unexposed surface of exterior walls as required by ASTM E 119 or UL 263 shall not apply. Where protected openings are limited by Section 704.8, the limitation on the rise of temperature on the unexposed surface of exterior walls as required by ASTM E 119 or UL 263 shall not apply provided that a correction is made for radiation from the unexposed exterior wall surface in accordance with the following formula:

$$A_e = A + (A_f \times F_{eo}) \quad \text{(Equation 7-1)}$$

where:

A_e = Equivalent area of protected openings.

A = Actual area of protected openings.

A_f = Area of exterior wall surface in the story under consideration exclusive of openings, on which the temperature limitations of ASTM E 119 or UL 263 for walls are exceeded.

F_{eo} = An "equivalent opening factor" derived from Figure 704.7 based on the average temperature of the unexposed wall surface and the fire-resistance rating of the wall.

704.9 Vertical separation of openings. Openings in exterior walls in adjacent stories shall be separated vertically to protect against fire spread on the exterior of the buildings where the openings are within 5 feet (1524 mm) of each other horizontally and the opening in the lower story is not a protected opening with a fire protection rating of not less than 3/4 hour. Such openings shall be separated vertically at least 3 feet (914 mm) by spandrel girders, exterior walls or other similar assemblies that have a fire-resistance rating of at least 1 hour or by flame barriers that extend horizontally at least 30 inches (762 mm) beyond the exterior wall. Flame barriers shall also have a fire-resistance rating of at least 1 hour. The unexposed surface temperature limitations specified in ASTM E 119 or UL 263 shall not apply to the flame barriers or vertical separation unless otherwise required by the provisions of this code.

Exceptions:

1. This section shall not apply to buildings that are three stories or less in height.
2. This section shall not apply to buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2.
3. Open parking garages.

706.2.1 Fire-resistance-rated glazing. Fire-resistance-rated glazing, when tested in accordance with ASTM E 119 or UL 263 and complying with the requirements of Section 706, shall be permitted. Fire-resistance-rated glazing shall bear a label or other identification showing the name of the manufacturer, the test standard and the identifier "W-XXX," where the "XXX" is the fire-resistance rating in minutes. Such label or identification shall be issued by an approved agency and shall be permanently affixed to the glazing.

706.7 Openings. Openings in a fire barrier wall shall be protected in accordance with Section 715. Openings shall be limited to a maximum aggregate width of 25 percent of the length of the wall, and the maximum area of any single opening shall not exceed 156 square feet (15m²). Openings in exit enclosures and exit passageways shall also comply with Sections 1020.1.1 and 1021.4, respectively.

Exceptions:

1. Openings shall not be limited to 156 square feet (15 m²) where adjoining fire areas are equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.
2. Fire doors serving an exit enclosure.
3. Openings shall not be limited to 156 square feet (15 m²) or an aggregate width of 25 percent of the length of the wall where the opening protective assembly has been tested in accordance with ASTM E 119 or UL 263 and has a minimum fire-resistance rating not less than the fire-resistance rating of the wall.
4. Fire windows permitted in atrium separation walls shall not be limited to a maximum aggregate width of 25 percent of length of the wall.

711.3.2 Access doors. Access doors shall be permitted in ceilings of fire-resistance-rated floor/ceiling and roof/ceiling assemblies provided such doors are tested in accordance with ASTM E 119 or UL 263 as horizontal assemblies and labeled by an approved agency for such purpose.

712.3.1 Through penetrations. Through penetrations of fire-resistance-rated walls shall comply with Section 712.3.1.1 or 712.3.1.2.

Exception: Where the penetrating items are steel, ferrous or copper pipes, tubes or conduits, the annular space between the penetrating item and the fire-resistance-rated wall is permitted to be protected as follows:

1. In concrete or masonry walls where the penetrating item is a maximum 6-inch (152 mm) nominal diameter and the area of the opening through the wall does not exceed 144 square inches (0.0929 m²), concrete, grout or mortar is permitted where it is installed the full thickness of the wall or the thickness required to maintain the fire-resistance rating; or
2. The material used to fill the annular space shall prevent the passage of flame and hot gases sufficient to ignite cotton waste when subjected to ASTM E 119 or UL 263 time-temperature fire conditions under a minimum positive pressure differential of 0.01 inch (2.49 Pa) of water at the location of the penetration for the time period equivalent to the fire-resistance rating of the construction penetrated.

712.4.1.1 Through penetrations. Through penetrations of fire-resistance-rated horizontal assemblies shall comply with Section 712.4.1.1.1 or 712.4.1.1.2.

Exceptions:

1. Penetrations by steel, ferrous or copper conduits, pipes, tubes or vents or concrete or masonry items through a single fire-resistance-rated floor assembly where the annular space is protected with materials that prevent the passage of flame and hot gases sufficient to ignite cotton waste when subjected to ASTM E 119 or UL 263 time-temperature fire conditions under a minimum positive pressure differential of 0.01 inch (2.49 Pa) of water at the location of the penetration for the time period equivalent to the fire-resistance rating of the construction penetrated. Penetrating items with a maximum 6-inch (152 mm) nominal diameter shall not be limited to the penetration of a single fire-resistance-rated floor assembly, provided the aggregate area of the openings through the assembly does not exceed 144 square inches (92 900 mm²) in any 100 square feet (9.3 m²) of floor area.
2. Penetrations in a single concrete floor by steel, ferrous or copper conduits, pipes, tubes or vents with a maximum 6-inch (152 mm) nominal diameter, provided the concrete, grout or mortar is installed the full thickness of the floor or the thickness required to maintain the fire-resistance rating. The penetrating items shall not be limited to the penetration of a single concrete floor, provided the area of the opening through each floor does not exceed 144 square inches (92 900 mm²).
3. Penetrations by listed electrical boxes of any material, provided such boxes have been tested for use in fire-resistance-rated assemblies and installed in accordance with the instructions included in the listing.

713.1 General. Joints installed in or between fire-resistance-rated walls, floor or floor/ceiling assemblies and roofs or roof/ceiling assemblies shall be protected by an approved fire-resistant joint system designed to resist the passage of fire for a time period not less than the required fire-resistance rating of the wall, floor or roof in or between which it is installed. Fire-resistant joint systems shall be tested in accordance with Section 713.3. The void created at the intersection of a floor/ceiling assembly and an exterior curtain wall assembly shall be protected in accordance with Section 713.4.

Exception: Fire-resistant joint systems shall not be required for joints in all of the following locations:

1. Floors within a single dwelling unit.
2. Floors where the joint is protected by a shaft enclosure in accordance with Section 707.
3. Floors within atriums where the space adjacent to the atrium is included in the volume of the atrium for smoke control purposes.
4. Floors within malls.
5. Floors within open parking structures.
6. Mezzanine floors.
7. Walls that are permitted to have unprotected openings.
8. Roofs where openings are permitted.
9. Control joints not exceeding a maximum width of 0.625 inch (15.9 mm) and tested in accordance with ASTM E 119 or UL 263.

713.4 Exterior curtain wall/floor intersection. Where fire resistance-rated floor or floor/ceiling assemblies are required, voids created at the intersection of the exterior curtain wall assemblies and such floor assemblies shall be sealed with an approved material or system to prevent the interior spread of fire. Such material or systems shall be securely installed and capable of preventing the passage of flame and hot gases sufficient to ignite cotton waste where subjected either to ASTM E 119 or UL 263 time-temperature fire conditions under a minimum positive pressure differential of 0.01 inch (0.254 mm) of water column (2.5 Pa) or installed as tested in accordance with ASTM E 2307 for the time period at least equal to the fire-resistance rating of the floor assembly. Height and fire-resistance requirements for curtain wall spandrels shall comply with Section 704.9.

714.7 Seismic isolation systems. Fire-resistance ratings for the isolation system shall meet the fire-resistance rating required for the columns, walls or other structural elements in which the isolation system is installed in accordance with Table 601. Isolation systems required to have a fire-resistance rating shall be protected with approved materials or construction assemblies designed to provide the same degree of fire resistance as the structural element in which it is installed when tested in accordance with ASTM E 119 or UL 263 (see Section 703.2).

Such isolation system protection applied to isolator units shall be capable of retarding the transfer of heat to the isolator unit in such a manner that the required gravity load-carrying capacity of the isolator unit will not be impaired after exposure to the standard time-temperature curve fire test prescribed in ASTM E 119 or UL 263 for a duration not less than that required for the fire-resistance rating of the structure element in which it is installed.

Such isolation system protection applied to isolator units shall be suitably designed and securely installed so as not to dislodge, loosen, sustain damage or otherwise impair its ability to accommodate the seismic movements for which the isolator unit is designed and to maintain its integrity for the purpose of providing the required fire-resistance protection.

715.2 Fire-resistance-rated glazing. Labeled fire-resistance-rated glazing tested as part of a fire-resistance-rated wall assembly in accordance with ASTM E 119 or UL 263 shall not be required to comply with this section.

716.5.2 (IMC 607.5.2) Fire barriers. Ducts and air transfer openings of fire barriers shall be protected with approved fire dampers installed in accordance with their listing. Ducts and air transfer openings shall not penetrate exit enclosures and exit passageways except as permitted by Sections 1020.1.2 and 1021.5, respectively.

Exception: Fire dampers are not required at penetrations of fire barriers where any of the following apply:

1. Penetrations are tested in accordance with ASTM E 119 or UL 263 as part of the fire-resistance rated assembly.
2. Ducts are used as part of an approved smoke control system in accordance with Section 909 and where the use of a fire damper would interfere with the operation of a smoke control system.
3. Such walls are penetrated by ducted HVAC systems, have a required fire-resistance rating of 1 hour or less, are in areas of other than Group Hand are in buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2. For the purposes of this exception, a ducted HVAC system shall be a duct system for conveying supply, return or exhaust air as part of the structure's HVAC system. Such a duct system shall be constructed of sheet steel not less than 26 gage thickness and shall be continuous from the air-handling appliance or equipment to the air outlet and inlet terminals.

716.5.3 (IMC 607.5.5) Shaft enclosures. Shaft enclosures that are permitted to be penetrated by ducts and air transfer openings shall be protected with approved fire and smoke dampers installed in accordance with their listing.

Exceptions:

1. Fire dampers are not required at penetrations of shafts where:
 - 1.1. Steel exhaust subducts are extended at least 22 inches (559 mm) vertically in exhaust shafts, provided there is a continuous airflow upward to the outside; or
 - 1.2. Penetrations are tested in accordance with ASTM E 119 or UL 263 as part of the rated assembly; or
 - 1.3. Ducts are used as part of an approved smoke control system designed and installed in accordance with Section 909 and where the fire damper will interfere with the operation of the smoke control system; or
 - 1.4. The penetrations are in parking garage exhaust or supply shafts that are separated from other building shafts by not less than 2-hour fire-resistance-rated construction.
2. In Group B and R occupancies, equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1, smoke dampers are not required at penetrations of shafts where:
 - 2.1. Kitchen, clothes dryer, bathroom and toilet room exhaust openings are installed with steel exhaust subducts, having a wall thickness of at least 0.019 inch (0.48 mm); and
 - 2.2. That extend at least 22 inches (559 mm) vertically; and
 - 2.3. An exhaust fan is installed at the upper terminus of the shaft that is, powered continuously in accordance with the provisions of Section 909.11, so as to maintain a continuous upward airflow to the outside.
3. Smoke dampers are not required at penetration of exhaust or supply shafts in parking garages that are separated from other building shafts by not less than 2-hour fire-resistance-rated construction.
4. Smoke dampers are not required at penetrations of shafts where ducts are used as part of an approved mechanical smoke control system designed in accordance with Section 909 and where the smoke damper will interfere with the operation of the smoke control system.

716.6.1 (IMC 607.6.1) Through penetrations. In occupancies other than Groups I-2 and I-3, a duct constructed of approved materials in accordance with the *International Mechanical Code* that penetrates a fire-resistance-rated floor/ceiling assembly that connects not more than two stories is permitted without shaft enclosure protection, provided a listed fire damper is installed at the floor line or the duct is protected in accordance with Section 712.4. For air transfer openings, see Exception 7 to Section 707.2.

Exception: A duct is permitted to penetrate three floors or less without a fire damper at each floor, provided it meets all of the following requirements:

1. The duct shall be contained and located within the cavity of a wall and shall be constructed of steel not less than 0.019 inch (0.48 mm) (26 gage) in thickness.
2. The duct shall open into only one dwelling or sleeping unit and the duct system shall be continuous from the unit to the exterior of the building.
3. The duct shall not exceed 4-inch (102 mm) nominal diameter and the total area of such ducts shall not exceed 100 square inches (0.065 m²) in any 100 square feet (9.3 m²) of floor area.
4. The annular space around the duct is protected with materials that prevent the passage of flame and hot gases sufficient to ignite cotton waste where subjected to ASTM E 119 or UL 263 time-temperature conditions under a minimum positive pressure differential of 0.01 inch (2.49 Pa) of water at the location of the penetration for the time period equivalent to the fire-resistance rating of the construction penetrated.
5. Grille openings located in a ceiling of a fire-resistance-rated floor/ceiling or roof/ceiling assembly shall be protected with a listed ceiling radiation damper installed in accordance with Section 716.6.2.1.

716.6.2.1 (IMC 607.6.2.1) Ceiling radiation dampers. Ceiling radiation dampers shall be tested in accordance with UL 555C and installed in accordance with the manufacturer's installation instructions and listing. Ceiling radiation dampers are not required where either of the following applies:

1. Tests in accordance with ASTM E 119 or UL 263 have shown that ceiling radiation dampers are not necessary in order to maintain the fire-resistance rating of the assembly.
2. Where exhaust duct penetrations are protected in accordance with Section 712.4.1.2, are located within the cavity of a wall and do not pass through another dwelling unit or tenant space.

TABLE 720.1(1)
MINIMUM PROTECTION OF STRUCTURAL PARTS BASED ON TIME PERIODS
FOR VARIOUS NONCOMBUSTIBLE INSULATING MATERIALS^m

(Portions of table not shown do not change)

For SI: 1 inch = 25.4 mm, 1 square inch = 645.2 mm², 1 cubic foot = 0.0283 m³.

- a. Reentrant parts of protected members to be filled solidly.
- b. Two layers of equal thickness with a 3/4-inch airspace between.
- c. For all of the construction with gypsum wallboard described in Table 720.1(1), gypsum base for veneer plaster of the same size, thickness and core type shall be permitted to be substituted for gypsum wallboard, provided attachment is identical to that specified for the wallboard and the joints on the face layer are reinforced, and the entire surface is covered with a minimum of 1/16-inch gypsum veneer plaster.
- d. An approved adhesive qualified under ASTM E 119 or UL 263.
- e. Where lightweight or sand-lightweight concrete having an oven-dry weight of 110 pounds per cubic foot or less is used, the tabulated minimum cover shall be permitted to be reduced 25 percent, except that in no case shall the cover be less than 3/4 inch in slabs or 1 1/2 inches in beams or girders.
- f. For solid slabs of siliceous aggregate concrete, increase tendon cover 20 percent.
- g. Adequate provisions against spalling shall be provided by U-shaped or hooped stirrups spaced not to exceed the depth of the member with a clear cover of 1 inch.
- h. Prestressed slabs shall have a thickness not less than that required in Table 720.1(3) for the respective fire resistance time period.
- i. Fire coverage and end anchorages shall be as follows: Cover to the prestressing steel at the anchor shall be 1/2 inch greater than that required away from the anchor. Minimum cover to steel-bearing plate shall be 1 inch in beams and 3/4 inch in slabs.
- j. For beam widths between 8 inches and 12 inches, cover thickness shall be permitted to be determined by interpolation.
- k. Interior spans of continuous slabs, beams and girders shall be permitted to be considered restrained.
- l. For use with concrete slabs having a comparable fire endurance where members are framed into the structure in such a manner as to provide equivalent performance to that of monolithic concrete construction.
- m. Generic fire-resistance ratings (those not designated as PROPRIETARY* in the listing) in GA 600 shall be accepted as if herein listed.
- n. No additional insulating material is required on the exposed outside face of the column flange to achieve a 1-hour fire-resistance rating.

1407.10.2 Thermal barriers. MCM shall be separated from the interior of a building by an approved thermal barrier consisting of 0.5-inch (12.7 mm) gypsum wallboard or equivalent thermal barrier material that will limit the average temperature rise of the unexposed surface to not more than 250°F (121°C) after 15 minutes of fire exposure in accordance with the standard time-temperature curve of ASTM E 119 or UL 263. The thermal barrier shall be installed in such a manner that it will remain in place for not less than 15 minutes based on a test conducted in accordance with UL 1715.

2603.4 Thermal barrier. Except as provided for in Sections 2603.4.1 and 2603.9, foam plastic shall be separated from the interior of a building by an approved thermal barrier of 0.5-inch (12.7 mm) gypsum wallboard or equivalent thermal barrier material that will limit the average temperature rise of the unexposed surface to not more than 250 F (120 C) after 15 minutes of fire exposure, complying with the standard time-temperature curve of ASTM E 119 or UL 263. The thermal barrier shall be installed in such a manner that it will remain in place for 15 minutes based on FM 4880, UL 1040, NFPA 286 or UL 1715. Combustible concealed spaces shall comply with Section 717.

2603.5.1 Fire-resistance-rated walls. Where the wall is required to have a fire-resistance rating, data based on tests conducted in accordance with ASTM E 119 or UL 263 shall be provided to substantiate that the fire-resistance rating is maintained.

PART II – IBC GENERAL

Revise as follows:

410.3.5.2 Fire test. A sample curtain with a minimum of two vertical seams shall be subjected to the standard fire test specified in ASTM E 119 or UL 263 for a period of 30 minutes. The curtain shall overlap the furnace edges by an amount that is appropriate to seal the top and sides. The curtain shall have a bottom pocket containing a minimum of 4 pounds per linear foot (5.9 kg/m) of batten. The exposed surface of the curtain shall not glow, and flame or smoke shall not penetrate the curtain during the test period. Unexposed surface temperature and hose stream test requirements are not applicable to the proscenium fire safety curtain test.

PART III – IBC STRUCTURAL

1. Revise as follows:

2103.2 Clay or shale masonry units. Clay or shale masonry units shall conform to the following standards: ASTM C 34 for structural clay load-bearing wall tile; ASTM C56 for structural clay nonload-bearing wall tile; ASTM C 62 for building brick (solid masonry units made from clay or shale); ASTM C 1088 for solid units of thin veneer brick; ASTM C 126 for ceramic-glazed structural clay facing tile, facing brick and solid masonry units; ASTM C 212 for structural clay facing tile; ASTM C 216 for facing brick (solid masonry units made from clay or shale); ASTM C 652 for hollow brick (hollow masonry units made from clay or shale); and ASTM C 1405 for glazed brick (single-fired solid brick units).

Exception: Structural clay tile for nonstructural use in fireproofing of structural members and in wall furring shall not be required to meet the compressive strength specifications. The fire-resistance rating shall be determined in accordance with ASTM E 119 or UL 263 and shall comply with the requirements of Table 602.

2. Add standard to Chapter 35 as follows:

UL

UL 263-03 Standard for Fire Test of Building Construction and Materials

PART IV – IRC BUILDING/ENERGY

Revise as follows:

R314.4 Thermal barrier. Unless otherwise allowed in Section R314.5 or Section R314.6, foam plastic shall be separated from the interior of a building by an approved thermal barrier of minimum 0.5 inch (12.7 mm) gypsum wallboard or an approved finish material equivalent to a thermal barrier material that will limit the average temperature rise of the unexposed surface to no more than 250°F (139°C) after 15 minutes of fire exposure complying with the ASTM E 119 or UL 263 standard time temperature curve. The thermal barrier shall be installed in such a manner that it will remain in place for 15 minutes based on NFPA 286 with the acceptance criteria of Section R315.4, FM 4880, UL 1040 or UL 1715.

R317.1 Two-family dwellings. Dwelling units in two-family dwellings shall be separated from each other by wall and/or floor assemblies having not less than a 1-hour fire-resistance rating when tested in accordance with ASTM E 119 or UL 263. Fire-resistance-rated floor-ceiling and wall assemblies shall extend to and be tight against the exterior wall, and wall assemblies shall extend to the underside of the roof sheathing.

Exceptions:

1. A fire-resistance rating of ½ hour shall be permitted in buildings equipped throughout with an automatic sprinkler system installed in accordance with NFPA 13.
2. Wall assemblies need not extend through attic spaces when the ceiling is protected by not less than 5/8-inch (15.9 mm) Type X gypsum board and an attic draft stop constructed as specified in Section R502.12.1 is provided above and along the wall assembly separating the dwellings. The structural framing supporting the ceiling shall also be protected by not less than ½-inch (12.7 mm) gypsum board or equivalent.

R317.3.1 Through penetrations. Through penetrations of fire-resistance-rated wall or floor assemblies shall comply with Section R317.3.1.1 or R317.3.1.2.

Exception: Where the penetrating items are steel, ferrous or copper pipes, tubes or conduits, the annular space shall be protected as follows:

1. In concrete or masonry wall or floor assemblies where the penetrating item is a maximum 6 inches (152 mm) nominal diameter and the area of the opening through the wall does not exceed 144 square inches (92 900 mm²), concrete, grout or mortar is permitted where installed to the full thickness of the wall or floor assembly or the thickness required to maintain the fire-resistance rating.
2. The material used to fill the annular space shall prevent the passage of flame and hot gases sufficient to ignite cotton waste where subjected to ASTM E 119 or UL 263 time temperature fire conditions under a minimum positive pressure differential of 0.01 inch of water (3 Pa) at the location of the penetration for the time period equivalent to the fire resistance rating of the construction penetrated.

Reason: Add a direct reference to UL 263 where ASTM E119 is currently referenced.

The purpose of this code change is to include reference to UL 263 as an alternate to ASTM E 119, which is currently referenced in these code sections. These two Standards describe the same test method. The specifications for the test apparatus and test procedure are identical between the two standards. As such, identical test results would be obtained from tests conducted using each of these methods. UL 263 is an ANSI approved standard.

The inclusion of this alternate test method would provide the authority having jurisdiction with the flexibility to accept listed and labeled products evaluated in accordance with ASTM E 119 or UL 263.

These fire tests are applicable to assemblies of masonry units and to composite assemblies of structural materials for buildings, including bearing and other walls and partitions, columns, girders, beams, slabs, and composite slab and beam assemblies for floors and roofs. They are also applicable to other assemblies and structural units that constitute permanent integral parts of a finished building.

Bibliography: UL 263

Cost Impact: The code change proposal will not increase the cost of construction

Analysis: Results of the review of the proposed standard(s) will be posted on the ICC website by August 20, 2006.

Public Hearing Results

Note: The following analysis was not in the Code Change Proposal book but was published in the "Errata to the 2006/2007 Proposed Changes to the International Codes and Analysis of Proposed Referenced Standards" provided at the code development hearings:

Analysis: Review of proposed new standard indicated that, in the opinion of staff, the standard did comply with ICC standards criteria

PART I — IBC FIRE SAFETY

Committee Action:

Approved as Submitted

Committee Reason: Similar to the action taken on FS8-06/07 the addition of the new standard does provide additional flexibility for the designer and building official. While there was some uncertainty regarding whether the UL standard has incorporated some of the recent changes that have been made to the ASTM E 119 standard, the proposed UL standard does match up with the currently referenced E 119 standard.

Assembly Action:

None

PART II — IBC GENERAL

Committee Action:

Approved as Submitted

Committee Reason: The inclusion of UL 263 as an alternate and equivalent standard to ASTM E 119 was felt to be an appropriate addition to the code. This is also consistent with the actions taken on the other portions of this code change.

Assembly Action:

None

PART III — IBC STRUCTURAL

Committee Action:

Approved as Submitted

Committee Reason: The change adds a needed reference to a fire test standard.

Assembly Action:

None

PART IV — IRC

Committee Action:

Approved as Submitted

Committee Reason: The new reference to the Standard UL 263 adds depth to the code and provides an alternative to ASTM E119. These two standards describe the same test method. The addition of this alternate test method provides the authority having jurisdiction with the flexibility to accept listed and labeled products evaluated under UL 263.

Assembly Action:

None

Public Comments

PARTS II, III AND IV DID NOT RECEIVE ANY PUBLIC COMMENTS AND WERE APPROVED AS SUBMITTED, PER THE COMMITTEE RECOMMENDATIONS.

Individual Consideration Agenda

PART I

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Bob Eugene, Underwriters Laboratories, Inc., requests Approval as Modified by this public comment for Part I.

Modify proposal as follows:

703.2.3 Restrained classification. Fire-resistance-rated assemblies tested under ASTM E 119 or UL 263 shall not be considered to be restrained unless evidence satisfactory to the building official is furnished by the registered design professional showing that the construction qualifies for a restrained classification in accordance with ASTM E 119 or UL 263. Restrained construction shall be identified on the plans.

(Portions of proposal not shown remain unchanged)

Commenter's Reason: Editorial. The term "or UL 263" was added throughout the I-codes wherever ASTM E 119 was referenced, but in this one section, the revision was missed in the first sentence.

Final Hearing Results

FS10-06/07, Part I	AMPC1
FS10-06/07, Part II	AS
FS10-06/07, Part III	AS
FS10-06/07, Part IV	AS

Code Change No: **FS11-06/07**

Original Proposal

Sections: 402.10, 402.15.4, 406.5.2, 406.6.6.3 and 410.3.5.3, 703.4.2, 719.1, 719.4, 802.1, 803.1, 803.5, 803.6.1, 803.6.2, 1407.10.1, 2603.3, 2603.5.4, 2606.4, Chapter 35 (New) D102.2.8, D106; IFC 804.2.4, 803.5.1, [F] 806.5, [F] 2606.2.4, Chapter 45; IRC R314.3, R314.6, R315.3, R315.4, R316.1, R316.2, M1601.2.1, Chapter 43; IWUIC 202, Chapter 7

Proponent: Bob Eugene, Underwriters Laboratories Inc.

THIS PROPOSAL IS ON THE AGENDA OF THE IBC FIRE SAFETY, GENERAL AND STRUCTURAL, IFC, IRC BUILDING/ENERGY, MECHANICAL AND WUIC CODE DEVELOPMENT COMMITTEES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IBC FIRE SAFETY

1. Revise as follows:

703.4.2 Composite materials. Materials having a structural base of noncombustible material as determined in accordance with Section 703.4.1 with a surfacing not more than 0.125 inch (3.18 mm) thick that has a flame spread index not greater than 50 when tested in accordance with ASTM E 84 or UL 723 shall be acceptable as noncombustible materials.

719.1 General. Insulating materials, including facings such as vapor retarders and vapor-permeable membranes, similar coverings, and all layers of single and multilayer reflective foil insulations, shall comply with the requirements of this section. Where a flame spread index or a smoke-developed index is specified in this section, such index shall be determined in accordance with ASTM E 84 or UL 723. Any material that is subject to an increase in flame spread index or smoke-developed index beyond the limits herein established through the effects of age, moisture, or other atmospheric conditions shall not be permitted.

Exceptions:

1. Fiberboard insulation shall comply with Chapter 23.
2. Foam plastic insulation shall comply with Chapter 26.
3. Duct and pipe insulation and duct and pipe coverings and linings in plenums shall comply with the *International Mechanical Code*.

719.4 Loose-fill insulation. Loose-fill insulation materials that cannot be mounted in the ASTM E 84 or UL 723 apparatus without a screen or artificial supports shall comply with the flame spread and smoke-developed limits of Sections 719.2 and 719.3 when tested in accordance with CAN/ULC S102.2.

Exception: Cellulose loose-fill insulation shall not be required to comply with the flame spread index requirement of CAN/ULC S102.2, provided such insulation complies with the requirements of Section 719.6.

802.1 FLAME SPREAD INDEX. A comparative measure, expressed as a dimensionless number, derived from visual measurements of the spread of flame versus time for a material tested in accordance with ASTM E 84 or UL 723.

803.1 General. Interior wall and ceiling finishes shall be classified in accordance with ASTM E 84 or UL 723. Such interior finish materials shall be grouped in the following classes in accordance with their flame spread and smoke-developed indexes.

- Class A: Flame spread 0-25; smoke-developed 0-450.
- Class B: Flame spread 26-75; smoke-developed 0-450.
- Class C: Flame spread 76-200; smoke-developed 0-450.

Exception: Materials, other than textiles, tested in accordance with Section 803.2.

803.5 Interior finish requirements based on group. Interior wall and ceiling finish shall have a flame spread index not greater than that specified in Table 803.5 for the group and location designated. Interior wall and ceiling finish materials, other than textiles, tested in accordance with NFPA 286 and meeting the acceptance criteria of Section 803.2.1, shall be permitted to be used where a Class A classification in accordance with ASTM E 84 or UL 723 is required.

803.6.1 Surface burning characteristic test. Textile wall and ceiling coverings shall have a Class A flame spread index in accordance with ASTM E 84 or UL 723 and be protected by automatic sprinklers installed in accordance with Section 903.3.1.1 or 903.3.1.2.

1407.9 Surface-burning characteristics. Unless otherwise specified, MCM shall have a flame spread index of 75 or less and a smoke-developed index of 450 or less when tested as an assembly in the maximum thickness intended for use in accordance with ASTM E 84 or UL 723.

1407.10.1 Surface-burning characteristics. MCM shall have a flame spread index of not more than 25 and a smoke-developed index of not more than 450 when tested as an assembly in the maximum thickness intended for use in accordance with ASTM E 84 or UL 723.

2603.3 Surface-burning characteristics. Unless otherwise indicated in this section, foam plastic insulation and foam plastic cores of manufactured assemblies shall have a flame spread index of not more than 75 and a smoke-developed index of not more than 450 where tested in the maximum thickness intended for use in accordance with ASTM E 84 or UL 723. Loose fill-type foam plastic insulation shall be tested as board stock for the flame spread index and smoke-developed index.

Exceptions:

1. Smoke-developed index for interior trim as provided for in Section 2604.2.
2. In cold storage buildings, ice plants, food plants, food processing rooms and similar areas, foam plastic insulation where tested in a thickness of 4 inches (102 mm) shall be permitted in a thickness up to 10 inches (254 mm) where the building is equipped throughout with an automatic fire sprinkler system in accordance with Section 903.3.1.1. The approved automatic sprinkler system shall be provided in both the room and that part of the building in which the room is located.
3. Foam plastic insulation that is a part of a Class A, B or C roof-covering assembly provided the assembly with the foam plastic insulation satisfactorily passes FM 4450 or UL 1256. The smoke-developed index shall not be limited for roof applications.
4. Foam plastic insulation greater than 4 inches (102 mm) in thickness shall have a maximum flame spread index of 75 and a smoke-developed index of 450 where tested at a minimum thickness of 4 inches (102 mm), provided the end use is approved in accordance with Section 2603.9 using the thickness and density intended for use.
5. Flame spread and smoke-developed indexes for foam plastic interior signs in covered mall buildings provided the signs comply with Section 402.15.

2603.4.1.13 Type V construction. Foam plastic spray applied to a sill plate and header of Type V construction is subject to all of the following:

1. The maximum thickness of the foam plastic shall be 3¼ inches (82.6 mm).
2. The density of the foam plastic shall be in the range of 1.5 to 2.0 pcf (24 to 32 kg/m³).
3. The foam plastic shall have a flame spread index of 25 or less and an accompanying smoke-developed index of 450 or less when tested in accordance with ASTM E 84 or UL 723.

2603.5.4 Flame spread and smoke-developed indexes. Foam plastic insulation, exterior coatings and facings shall be tested separately in the thickness intended for use, but not to exceed 4 inches (102 mm), and shall each have a flame spread index of 25 or less and a smoke-developed index of 450 or less as determined in accordance with ASTM E 84 or UL 723.

Exception: Prefabricated or factory-manufactured panels having minimum 0.020-inch (0.51 mm) aluminum facings and a total thickness of 0.25 inch (6.4 mm) or less are permitted to be tested as an assembly where the foam plastic core is not exposed in the course of construction.

2606.4 Specifications. Light-transmitting plastics, including thermoplastic, thermosetting or reinforced thermosetting plastic material, shall have a self-ignition temperature of 650°F (343°C) or greater where tested in accordance with ASTM D 1929; a smoke-developed index not greater than 450 where tested in the manner intended for use in accordance with ASTM E 84 or UL 723, or not greater than 75 where tested in the thickness intended for use in accordance with ASTM D 2843 and shall conform to one of the following combustibility classifications:

Class CC1: Plastic materials that have a burning extent of 1 inch (25 mm) or less where tested at a nominal thickness of 0.060 inch (1.5 mm), or in the thickness intended for use, in accordance with ASTM D 635,

Class CC2: Plastic materials that have a burning rate of 2.5 inches per minute (1.06 mm/s) or less where tested at a nominal thickness of 0.060 inch (1.5 mm), or in the thickness intended for use, in accordance with ASTM D 635.

D102.2.8 Permanent canopies. Permanent canopies are permitted to extend over adjacent open spaces provided:

1. The canopy and its supports shall be of noncombustible material, fire-retardant-treated wood, Type IV construction or of 1-hour fire-resistance-rated construction.

Exception: Any textile covering for the canopy shall meet the fire propagation performance criteria of NFPA 701 after both accelerated water leaching and accelerating weathering.

2. Any canopy covering, other than textiles, shall have a flame spread index not greater than 25 when tested in accordance with ASTM E 84 or UL 723 in the form intended for use.
3. The canopy shall have at least one long side open.
4. The maximum horizontal width of the canopy shall not exceed 15 feet (4572 mm).
5. The fire resistance of exterior walls shall not be reduced.

2. Add new standard to Chapter 35 and Appendix D as follows:

UL

723-03 Standard for Test for Surface Burning Characteristics of Building Materials, with Revisions through May 2005

SECTION D106 REFERENCED STANDARDS

ASTM

E 84-04 Test Method for Surface Burning Characteristics of Building Materials

PART II – IBC GENERAL

1. Revise as follows:

402.10 Kiosks. Kiosks and similar structures (temporary or permanent) shall meet the following requirements:

1. Combustible kiosks or other structures shall not be located within the mall unless constructed of any of the following materials:
 - 1.1. Fire-retardant-treated wood complying with Section 2303.2.
 - 1.2. Foam plastics having a maximum heat release rate not greater than 100kW (105 Btu/h) when tested in accordance with the exhibit booth protocol in UL 1975.
 - 1.3. Aluminum composite material (ACM) having a flame spread index of not more than 25 and a smoke-developed index of not more than 450 when tested as an assembly in the maximum thickness intended for use in accordance with ASTM E 84 or UL 723.
2. Kiosks or similar structures located within the mall shall be provided with approved fire suppression and detection devices.
3. The minimum horizontal separation between kiosks or groupings thereof and other structures within the mall shall be 20 feet (6096 mm).
4. Each kiosk or similar structure or groupings thereof shall have a maximum area of 300 square feet (28 m²).

402.15.4 Plastics other than foam plastics. Plastics other than foam plastics used in signs shall be light-transmitting plastics complying with Section 2606.4 or shall have a self-ignition temperature of 650°F (343°C) or greater when tested in accordance with ASTM D 1929, and a flame spread index not greater than 75 and smoke-developed index not greater than 450 when tested in the manner intended for use in accordance with ASTM E 84 or UL 723 or meet the acceptance criteria of Section 803.2.1 when tested in accordance with NFPA 286.

406.5.2 Canopies. Canopies under which fuels are dispensed shall have a clear, unobstructed height of not less than 13 feet 6 inches (4115 mm) to the lowest projecting element in the vehicle drive-through area. Canopies and their supports over pumps shall be of noncombustible materials, fire-retardant-treated wood complying with Chapter 23, wood of Type IV sizes or of construction providing 1-hour fire resistance. Combustible materials used in or on a canopy shall comply with one of the following:

1. Shielded from the pumps by a noncombustible element of the canopy, or wood of Type IV sizes;
2. Plastics covered by aluminum facing having a minimum thickness of 0.010 inch (0.30 mm) or corrosion-resistant steel having a minimum base metal thickness of 0.016 inch (0.41 mm). The plastic shall have a flame spread index of 25 or less and a smoke-developed index of 450 or less when tested in the form intended for use in accordance with ASTM E 84 or UL 723 and a self-ignition temperature of 650 F (343°C) or greater when tested in accordance with ASTM D 1929; or
3. Panels constructed of light-transmitting plastic materials shall be permitted to be installed in canopies erected over motor vehicle fuel-dispensing station fuel dispensers, provided the panels are located at least 10 feet (3048 mm) from any building on the same lot and face yards or streets not less than 40 feet (12 192 mm) in width on the other sides. The aggregate areas of plastics shall not exceed 1,000 square feet (93 m²). The maximum area of any individual panel shall not exceed 100 square feet (9.3 m²).

410.3.5.3 Smoke test. Curtain fabrics shall have a smoke-developed rating of 25 or less when tested in accordance with ASTM E 84 or UL 723.

3105.4 Canopy materials. Canopies shall be constructed of a rigid framework with an approved covering that meets the fire propagation performance criteria of NFPA 701 or has a flame spread index not greater than 25 when tested in accordance with ASTM E 84 or UL 723.

2. Add new standard to Chapter 35 as follows:

UL
723-03 Standard for Test for Surface Burning Characteristics of Building Materials, with Revisions through May 2005

PART III – IBC STRUCTURAL

Revise as follows:

2303.2 Fire-retardant-treated wood. Fire-retardant-treated wood is any wood product which, when impregnated with chemicals by a pressure process or other means during manufacture, shall have, when tested in accordance with ASTM E 84 or UL 723, a listed flame spread index of 25 or less and show no evidence of significant progressive combustion when the test is continued for an additional 20-minute period. In addition, the flame front shall not progress more than 10.5 feet (3200 mm) beyond the centerline of the burners at any time during the test.

PART IV – IFC

1. Revise as follows:

803.5.1 Textile wall coverings. Textile wall coverings shall comply with one of the following:

1. The coverings shall have a Class A flame spread index in accordance with ASTM E 84 or UL 723 and be protected by automatic sprinklers installed in accordance with Section 903.3.1.1 or 903.3.1.2,
2. The covering shall meet the criteria of Section 803.5.1.1 or 803.5.1.2 when tested in the manner intended for use in accordance with NFPA 265 using the product-mounting system, including adhesive, of actual use, or
3. The covering shall meet the criteria of Section 803.1.2.1 when tested in accordance with NFPA 286 using the product-mounting system, including adhesive, of actual use.

804.2.4 Flame spread. The flame spread rating shall not exceed 75 where tested in accordance with ASTM E 84 or UL 723. The smoke-developed index shall not be limited.

[F] 806.5 Interior trim. Material, other than foam plastic used as interior trim shall have a minimum Class C flame spread and smoke-developed index when tested in accordance with ASTM E 84 or UL 723, as described in Section 803.1. Combustible trim, excluding handrails and guardrails, shall not exceed 10 percent of the aggregate wall or ceiling area in which it is located.

[F] 2604.2.4 Flame spread. The flame spread index shall not exceed 75 where tested in accordance with ASTM E 84 or UL 723. The smoke-developed index shall not be limited.

2. Add new standard to Chapter 45 as follows:

UL 723-03 Standard for Test for Surface Burning Characteristics of Building Materials, with Revisions through May 2005

PART V – IRC BUILDING/ENERGY**1. Revise as follows:**

R314.3 Surface burning characteristics. Unless otherwise allowed in Section R314.5 or R314.6, all foam plastic or foam plastic cores used as a component in manufactured assemblies used in building construction shall have a flame spread index of not more than 75 and shall have a smoke-developed index of not more than 450 when tested in the maximum thickness intended for use in accordance with ASTM E84 or UL 723. Loose-fill type foam plastic insulation shall be tested as board stock for the flame spread index and smoke-developed index.

Exception: Foam plastic insulation more than 4 inches thick shall have a maximum flame spread index of 75 and a smoke-developed index of 450 where tested at a minimum thickness of 4 inches, provided the end use is approved in accordance with Section R314.6 using the thickness and density intended for use.

R314.6 Specific approval. Foam plastic not meeting the requirements of Sections R314.3 through R314.5 shall be specifically approved on the basis of one of the following approved tests: NFPA 286 with the acceptance criteria of Section R315.4, FM4880, UL 723, UL1040 or UL1715, or fire tests related to actual end-use configurations. The specific approval shall be based on the actual end use configuration and shall be performed on the finished foam plastic assembly in the maximum thickness intended for use. Assemblies tested shall include seams, joints and other typical details used in the installation of the assembly and shall be tested in the manner intended for use.

R315.3 Testing. Tests shall be made in accordance with ASTM E 84 or UL 723.

R315.4 Alternate test method. As an alternate to having a flame-spread classification of not greater than 200 and a smoke developed index of not greater than 450 when tested in accordance with ASTM E 84 or UL 723, wall and ceiling finishes, other than textiles, shall be permitted to be tested in accordance with NFPA 286. Materials tested in accordance with NFPA 286 shall meet the following criteria:

During the 40 kW exposure, the interior finish shall comply with Item 1. During the 160 kW exposure, the interior finish shall comply with Item 2. During the entire test, the interior finish shall comply with Item 3.

1. During the 40 kW exposure, flames shall not spread to the ceiling.
2. During the 160 kW exposure, the interior finish shall comply with the following:
 - 2.1. Flame shall not spread to the outer extremity of the sample on any wall or ceiling.
 - 2.2. Flashover, as defined in NFPA 286, shall not occur.
3. The total smoke released throughout the NFPA 286 test shall not exceed 1,000 m².

R316.1 Insulation. Insulation materials, including facings, such as vapor retarders or vapor permeable membranes installed within floor-ceiling assemblies, roof-ceiling assemblies, wall assemblies, crawl spaces and attics shall have a flame-spread index not to exceed 25 with an accompanying smoke-developed index not to exceed 450 when tested in accordance with ASTM E 84 or UL 723.

Exceptions:

1. When such materials are installed in concealed spaces, the flame-spread and smoke-developed limitations do not apply to the facings, provided that the facing is installed in substantial contact with the unexposed surface of the ceiling, floor or wall finish.
2. Cellulose loose-fill insulation, which is not spray applied, complying with the requirements of Section R316.3, shall only be required to meet the smoke-developed index of not more than 450.

R316.2 Loose-fill insulation. Loose-fill insulation materials that cannot be mounted in the ASTM E 84 or UL 723 apparatus without a screen or artificial supports shall comply with the flame spread and smoke-developed limits of Sections R316.1 and R316.4 when tested in accordance with CAN/ULC S102.2.

Exception: Cellulose loose-fill insulation shall not be required to comply with the flame spread index requirement of CAN/ULC S102.2, provided such insulation complies with the requirements of Section R316.3.

2. Add standard to Chapter 43 as follows:**UL**

723-03 Standard for Test for Surface Burning Characteristics of Building Materials, with Revisions through May 2005

PART VI – IRC MECHANICAL

Revise as follows:

M1601.2.1 Duct insulation materials. Duct insulation materials shall conform to the following requirements:

1. Duct coverings and linings, including adhesives where used, shall have a flame spread index not higher than 25, and a smoke-developed index not over 50 when tested in accordance with ASTM E 84 or UL 723, using the specimen preparation and mounting procedures of ASTM E 2231.
2. Duct coverings and linings shall not flame, glow, smolder or smoke when tested in accordance with ASTM C 411 at the temperature to which they are exposed in service. The test temperature shall not fall below 250°F (121°C).
3. External duct insulation and factory-insulated flexible ducts shall be legibly printed or identified at intervals not longer than 36 inches (914 mm) with the name of the manufacturer; the thermal resistance *R*-value at the specified installed thickness; and the flame spread and smoke-developed indexes of the composite materials. All duct insulation product *R*-values shall be based on insulation only, excluding air films, vapor retarders or other duct components, and shall be based on tested *C*-values at 75°F (24°C) mean temperature at the installed thickness, in accordance with recognized industry procedures. The installed thickness of duct insulation used to determine its *R*-value shall be determined as follows:
 - 3.1. For duct board, duct liner and factory-made rigid ducts not normally subjected to compression, the nominal insulation thickness shall be used.
 - 3.2. For ductwrap, the installed thickness shall be assumed to be 75 percent (25-percent compression) of nominal thickness.
 - 3.3. For factory-made flexible air ducts, The installed thickness shall be determined by dividing the difference between the actual outside diameter and nominal inside diameter by two.

PART VII - WUIC

1. Revise as follows:

**SECTION 202
DEFINITIONS**

NONCOMBUSTIBLE. As applied to building construction material means a material that, in the form in which it is used, is either one of the following:

1. Material of which no part will ignite and burn when subjected to fire. Any material conforming to ASTM E 136 shall be considered noncombustible within the meaning of this section.
2. Material having a structural base of noncombustible material as defined in Item 1 above, with a surfacing material not over 1/8 inch (3.2 mm) thick, which has a flame spread rating of 50 or less. Flame spread rating as used herein refers to rating obtained according to tests conducted as specified in ASTM E 84 or UL 723.

“Noncombustible” does not apply to surface finish materials. Material required to be noncombustible for reduced clearances to flues, heating appliances or other sources of high temperature shall refer to material conforming to Item 1. No material shall be classed as noncombustible that is subject to increase in combustibility or flame spread rating, beyond the limits herein established, through the effects of age, moisture or other atmospheric condition.

2. Add referenced standard to Chapter 7 as follows:

UL

723-03 Standard for Test for Surface Burning Characteristics of Building Materials, with Revisions through May 2005

Reason: (IBC, IFB, IMC, IRC and IWUIC) Add a direct reference to UL 723 where ASTM E84 is referenced throughout the family of I-codes. The purpose of this code change is to include reference to UL 723 as an alternate to ASTM E 84 throughout the family of I-codes. These two Standards describe the same test method. The specifications for the test apparatus and test procedure are identical between the two standards. As such, identical test results would be obtained from tests conducted using each of these methods. UL 723 is an ANSI approved standard. The inclusion of this alternate test method would provide the authority having jurisdiction with the flexibility to accept listed and labeled products evaluated in accordance with ASTM E 84 or UL 723. The purpose of the test is to determine the comparative burning characteristics of the material under test by evaluating the spread of flame over its surface and the density of the smoke developed when exposed to a test fire, and thus to establish a basis on which surface burning characteristics of different materials are compared.

Bibliography: UL 723

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: Results of the review of the proposed standard will be posted on the ICC website by August 20, 2006.

Public Hearing Results

Note: The following analysis was not in the Code Change Proposal book but was published in the "Errata to the 2006/2007 Proposed Changes to the International Codes and Analysis of Proposed Referenced Standards" provided at the code development hearings:

Analysis: Review of proposed new standard indicated that, in the opinion of staff, the standard did comply with ICC standards criteria

PART I — IBC FIRE SAFETY

Committee Action:

Approved as Submitted

Committee Reason: Similar to the action taken with both FS10 and FS8 above, the addition of the standard will provide added flexibility for both the designer and the building official. This action also coordinates with the action taken by the IFC and IBC Structural committees which have already met and approved this item.

Assembly Action:

None

PART II — IBC GENERAL

Committee Action:

Approved as Submitted

Committee Reason: The inclusion of UL 723 as an alternate and equivalent standard to E 119 was felt to be an appropriate addition to the code. This is also consistent with the actions taken on the other portions of this code change.

Assembly Action:

None

PART III — IBC STRUCTURAL

Committee Action:

Approved as Submitted

Committee Reason: The proposal clarifies fire-retardant treated wood requirements by adding an appropriate reference to a test standard.

Assembly Action:

None

PART IV — IFC

Committee Action:

Approved as Submitted

Committee Reason: Including a reference to UL 723 will provide the code official with greater flexibility in approving materials tested to either ASTM E84 or UL723, since both test standards are equivalent.

Assembly Action:

None

PART V — IRC

Committee Action:

Approved as Modified

Modify the proposal as follows:

R314.6 Specific approval. Foam plastic not meeting the requirements of Sections R314.3 through R314.5 shall be specifically approved on the basis of one of the following approved tests: NFPA 286 with the acceptance criteria of Section R315.4, FM4880, ~~UL 723~~, UL 1040 or UL 1715, or fire tests related to actual end-use configurations. The specific approval shall be based on the actual end use configuration and shall be performed on the finished foam plastic assembly in the maximum thickness intended for use. Assemblies tested shall include seams, joints and other typical details used in the installation of the assembly and shall be tested in the manner intended for use.

(Portions of proposal not shown remain unchanged)

Committee Reason: The new reference to UL 723 adds depth to the code and provides an alternative to ASTM E84. These two standards describe the same test method. The addition of this alternate test method provides the authority having jurisdiction with the flexibility to accept listed and labeled products evaluated under UL 723.

Section R314.6 was modified to remove the reference to UL723. The reference was not needed in this particular section of the IRC.

Assembly Action:

None

PART VI — IRC MECHANICAL

Committee Action:

Approved as Submitted

Committee Reason: The proposed change provides an alternate method of testing fire-rated assemblies by adding another consensus standard.

Assembly Action:

None

**PART VII — WUIC
Committee Action:**

Approved as Submitted

Committee Reason: Including a reference to UL 723 will provide the code official with greater flexibility in approving materials tested to either ASTM E84 or UL723, since both test standards are equivalent.

Assembly Action:

None

Final Hearing Results

FS11-06/07, Part I	AS
FS11-06/07, Part II	AS
FS11-06/07, Part III	AS
FS11-06/07, Part IV	AS
FS11-06/07, Part V	AM
FS11-06/07, Part VI	AS
FS11-06/07, Part VII	AS

Code Change No: FS14-06/07

Original Proposal

Sections: 703.5 (New); IFC 703.5 (New)

THIS PROPOSAL IS ON THE AGENDA OF THE IBC FIRE SAFETY AND THE IFC CODE DEVELOPMENT COMMITTEES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IBC FIRE SAFETY

Add new text as follows:

703.5 Marking and identification. Firewalls, fire barriers and fire partitions required to have a fire-resistance rating shall be identified with signs or stenciling in a manner acceptable to the building official, Such identification shall be above any decorative ceiling or in concealed spaces, and shall include the wording: FIRE WALL, FIRE BARRIER OR FIRE PARTITION: PROTECT ALL OPENINGS, or other approved wording.

PART II – IFC

Add new text as follows:

703.5 Marking and identification. Firewalls, fire barriers and fire partitions required to have a fire-resistance rating shall be identified with signs or stenciling in a manner acceptable to the fire code official, Such identification shall be above any decorative ceiling or in concealed spaces, and shall include the wording: FIRE WALL, FIRE BARRIER OR FIRE PARTITION: PROTECT ALL OPENINGS, or other approved wording.

Reason: The purpose of the codes is to establish the minimum requirements to safeguard the public health, safety and general welfare through structural strength, means of egress facilities, stability, sanitation, etc. The concern that is addressed by this proposed code change is the need for installed fire-resistance rated assemblies to maintain their fire-resistance over the life of the building. Many people writing on fire safety issues complain about the fact that rated assemblies are often compromised over time. It can probably be assumed that most of that damage done to rated assemblies does not occur maliciously, with the intent to damage a needed safety feature. Rather, the installation of an incorrect replacement door or window, or the penetration of the assembly without proper firestopping, is probably done due to the lack of information regarding the assembly's fire rating. Without some type of identification, how can tradespeople, maintenance workers or inspectors determine that an assembly is being compromised and below minimum requirements? If the building's code-mandated fire compartmentation is below minimum requirements, then we can assume the building will not perform as designed with the proper protections for the occupants or the fire fighters responding.

Across the country fire departments are reducing staffing in an effort to meet more restrictive budgets. One of the areas where there have been reductions is the inspection capabilities. In Cleveland, Ohio, the fire department cut staffing by approximately one hundred positions in the last few years. The Fire Prevention Bureau levels have been cut by two thirds, this means the department is relying on the front line companies to identify code violations and then refer those violations to individuals with the expertise to follow up. The problem is the lack of ability for untrained personnel to identify rated partitions and barriers. There is simply a lack of funding for enhanced training. Clearly identifying rated barriers and partitions will help the fire fighter on his inspection to identify any unacceptable breaches to rated assemblies. He can then refer the structure for a follow up inspection by a higher trained individual with the ability to identify the exact need to bring the structure back to the "Minimum Standard" of protection for the occupants.

Cost Impact: The code change proposal will have minimal cost impact.

Public Hearing Results

PART I – IBC FIRE SAFETY

Committee Action:

Disapproved

Committee Reason: See the comments provided with FS13-06/07 above. In addition, there was concern regarding the subjective Adecorative ceiling or in concealed spaces language of this proposal.

Assembly Action:

None

PART II – IFC

Committee Action:

Disapproved

Committee Reason: The proposal contains no guidance as to the size or stroke of the required wording. The change would require signs or stenciling to be installed in a concealed location and provides no guidance as to where signs would go if there were no decorative ceiling present. In existing buildings, the lack of construction documents would be problematic since there would be no guidance as to what assemblies in the building were constructed as fire walls, fire barriers or fire partitions, thereby making such a requirement more appropriate for new buildings. The change also provides no requirement for on-going maintenance of the markings.

Assembly Action:

None

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because public comments were submitted.

Public Comment 2:

Tony Crimi, A.C. Consulting Solutions, Inc., representing International Firestop Council, requests Approval as Modified by this public comment for Parts I and II.

Replace proposal with the following:

Add new text as follows:

703.5 Marking and identification. Fire walls, fire barriers, fire partitions, smoke barriers and smoke partitions or any other wall required to have protected openings or penetrations shall be effectively and permanently identified with signs or stenciling. Such identification shall:

1. Be located above any decorative ceiling, in concealed spaces or other approved location; and
2. Be repeated at intervals not exceeding 30 ft (9.14 m) measured horizontally along the wall or partition; and
3. Include lettering not less than 0.5 inch (12.7 mm) in height, incorporating the suggested wording: "FIRE AND/OR SMOKE BARRIER – PROTECT ALL OPENINGS", or other approved wording.

(Renumber subsequent section)

Commenter's Reason: Building modifications, installed equipment, inspections, change orders and construction projects can all generate a need to identify whether a particular assembly is required to act as a barrier to smoke or fire. This proposed code change addresses the need for installed fire-resistance rated assemblies to maintain their fire-resistance over the life of the building. This code change would introduce (or in the case of some Jurisdictions, re-introduce) a requirement for Marking and Identification of walls required to have a fire resistance rating, or intended to serve as barriers to smoke movement. This proposal will aid code officials, maintenance workers and contractors with enforcement and compliance to Codes and Standards.

This revised proposal takes into account the Committees reasons for disapproval of FS13-06/07, FS-14-06/07, FS15-06/07, FS73-06/07, and FS94-06/07 which were all related to barrier labeling or marking. Establishing the requirement for identification of building elements installed specifically to prevent the movement of fire and/or smoke is beneficial to the AHJ's responsible for issuing C of O and for building managers, maintenance workers and contractors working in buildings during daily building operation, future building renovations or routine inspections.

When buildings are engineered with fire rated walls and floors designed to contain smoke and/or fire, openings created in these assemblies by ducts, dampers, doors, windows, cable, conduit, pipe, ductwork, and installed equipment can compromise safety and jeopardize business continuity if not protected effectively. The addition of new through-penetrations over the life of a building is essentially inevitable, whether for wiring, plumbing or ventilation modifications. The tradesmen doing that work will not often be given the master plans of the building, and not know that their work may effective the performance of a critical building element. This can apply to several elements in a fire-resistive assembly such as dampers for ducts, firestopping, fire doors, and fire-rated glazing, which can easily be overlooked over the life of the building.

In providing testimony to the U.S. House of Representatives Committee on Science in the matter of NIST’s investigation of the world trade center collapse, in October 2005, on the lessons learned and application of those experiences to improve building safety, the ICC President testified as follows:

“NIST calls for more rigorous enforcement of codes. ICC believes a more appropriate term than enforcement is compliance. Enforcement is a means to achieve the goal of safe buildings, something embodied in compliance. There are other ways to secure compliance such as incentives or labeling that not only ensures the goal is reached but can secure results above and beyond simple enforcement of minimum codes and standards.”¹

Even if only in one small way, the addition of the proposed labeling during the construction phase of a building is of great benefit to over the course of the buildings life cycle and occupancy, and will facilitate ease of inspection throughout the life the building and during building renovation. Equally importantly, such identification marking also serves to alert trades people working within the building that, as penetrations are being made, the openings require additional consideration or protection.

The 1999 Standard Building Code contained requirements for the marking and identification of horizontal and vertical barriers required to either to have a fire-resistance rating or be effective barriers to the movement of smoke within a building. OSHA also has requirements for marking and labeling of safety features in buildings. Very similar language has also been a requirement of the Florida Building Code until the 2004 FBC. In those jurisdictions, the industry is already familiar with this requirement. Jurisdictions that have had this requirement in the past, have not reported widespread difficulties in trying to understand or enforce its application. To the contrary, in past cycles, we have heard testimony from those jurisdictions in support of this principal.

Final Hearing Results

**FS14-06/07, Part I AMPC2
FS14-06/07, Part II D**

Code Change No: FS22-06/07

Original Proposal

Table 704.8

Proponent: Marshall A. Klein, P.E., Marshall A. Klein & Associates, Inc., representing Marshall A. Klein & Associates, Inc.

Add table footnote as follows:

**TABLE 704.8
MAXIMUM AREA OF EXTERIOR WALL OPENINGS^a**

CLASSIFICATION OF OPENING	FIRE SEPARATION DISTANCE (feet)							
	0 to 3 ^{f,i,k}	Greater than 3 to 5 ^{c,g}	Greater than 5 to 10 ^{c,e,g,h}	Greater than 10 to 15 ^{d,e,g}	Greater than 15 to 20 ^{d,g}	Greater than 20 to 25 ^{d,g}	Greater than 25 to 30 ^{d,g}	Greater than 30
Unprotected	Not Permitted	Not Permitted ^c	10% ⁱ	15% ⁱ	25% ⁱ	45% ⁱ	70% ⁱ	No Limit ^b
Protected	Not Permitted	15%	25%	45%	75%	No Limit ^b	No Limit ^b	No Limit ^b

For SI: 1 foot = 304.8 mm.

- a. Values given are percentage of the area of the exterior wall.
- b. See Section 704.7 for unexposed surface temperature.
- c. For occupancies in Group R-3, the maximum percentage of unprotected and protected exterior wall openings shall be 25 percent.
- d. The area of openings in an open parking structure with a fire separation distance of greater than 10 feet shall not be limited.
- e. For occupancies in Group H-2 or H-3, unprotected openings shall not be permitted for openings with a fire separation distance of 15 feet or less.
- f. For requirements for fire walls for buildings with differing roof heights, see Section 705.6.1.

- g. The area of unprotected and protected openings is not limited for occupancies in Group R-3, with a fire separation distance greater than 5 feet.
- h. For special requirements for Group U occupancies, see Section 406.1.2.
- i. Buildings whose exterior bearing wall, exterior nonbearing wall and exterior structural frame are not required to be fire-resistance rated by Table 601 or 602 shall be permitted to have unlimited unprotected openings.
- j. Includes accessory buildings to Group R-3.
- k. For openings in a firewall for buildings on the same lot, see Section 705.8.

Reason: Addition of this new footnote "k" is proposed for editorial purposes as well as for user friendliness. There has been some confusion by code users on whether or not a firewall can have openings between buildings on the same lot under the IBC.

Under Table 704.8, since the exterior walls of two buildings on the same lot with a fire separation distance of 0' would not be permitted to have any openings in these exterior walls, some users are confused that replacing such exterior walls with a common firewall designed under Section 705 would then permit protected openings between the two buildings in the firewall.

Therefore, this new footnote "k" placed over the 0' fire separation distance column in the Table will eliminate such confusion, and direct the user to the appropriate section of the Code for opening protectives when a firewall is used between two buildings on the same lot.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: This proposal does provide clarification regarding how openings for fire walls are to be addressed. This will help to eliminate some confusion and will be consistent with the committee's understanding as to how this section should be interpreted.

Assembly Action:

None

Final Hearing Results

FS22-06/07

AS

Code Change No: **FS24-06/07**

Original Proposal

Sections: 704.8, 704.12

Proponent: Gregory R. Keith, Professional heuristic Development, representing The Boeing Company

1. Delete and substitute as follows:

~~**704.8 Allowable area of openings.** The maximum area of unprotected or protected openings permitted in an exterior wall in any story shall not exceed the values set forth in Table 704.8. Where both unprotected and protected openings are located in the exterior wall in any story, the total area of the openings shall comply with the following formula:~~

$$\frac{A}{a} + \frac{A_u}{a_u} \leq 1.0 \quad \text{(Equation 7-2)}$$

where:

~~A = Actual area of protected openings, or the equivalent area of protected openings, A_e (see Section 704.7).~~

~~a = Allowable area of protected openings.~~

~~A_u = Actual area of unprotected openings.~~

~~a_u = Allowable area of unprotected openings.~~

TABLE 704.8
MAXIMUM AREA OF EXTERIOR WALL OPENINGS^a

704.8.1 Automatic sprinkler system. In buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1, the maximum allowable area of unprotected openings in occupancies other than Groups H-1, H-2 and H-3 shall be the same as the tabulated limitations for protected openings.

704.8.2 First story. In occupancies other than Group H, unlimited unprotected openings are permitted in the exterior walls of the first story above grade facing a street that have a fire separation distance of greater than 15 feet (4572 mm) or facing an unoccupied space. The unoccupied space shall be on the same lot or dedicated for public use, shall not be less than 30 feet (9144 mm) in width and shall have access from a street by a posted fire lane in accordance with the *International Fire Code*.

704.8 Openings. Openings in exterior walls shall have a degree of opening protection based on the fire separation distance as specified in Table 704.8.

704.8.1 Allowable area of openings. The maximum area of unprotected and protected openings permitted in an exterior wall in any story of a building shall not exceed the percentages specified in Table 704.8.

Exceptions:

1. In other than Group H occupancies, unlimited unprotected openings are permitted in the exterior walls of the first story above grade facing a street that has a fire separation distance of greater than 15 feet (4572 mm), or facing an unoccupied space. Such unoccupied space shall be on the same lot or dedicated for public use, shall not be less than 30 feet (9144 mm) in width, and shall have access from a street by a posted fire lane in accordance with the *International Fire Code*.
2. Buildings whose exterior bearing walls, exterior nonbearing walls and exterior structural frame are not required to be fire-resistance rated shall be permitted to have unlimited unprotected openings.

704.8.2 Protected openings. Where required to be protected, fire doors and fire shutters shall comply with Section 715.4 and fire window assemblies shall comply with Section 715.5.

Exception: Opening protective assemblies are not required where the building is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 and the exterior openings are protected by a water curtain using automatic sprinklers approved for that use.

704.8.3 Unprotected openings. Where unprotected openings are permitted, windows and doors shall be constructed of any approved materials. Glazing shall conform to the requirements of Chapters 24 and 26.

704.8.4 Mixed openings. Where both unprotected and protected openings are located in the exterior wall in any story of a building, the total area of openings shall be determined in accordance with the following:

$$(A_p \div a_p) + (A_u \div a_u) \leq 1 \qquad \text{(Equation 7-2)}$$

where:

- A_p = Actual area of protected openings, or the equivalent area of protected openings, A_e (see Section 704.7).
- a_p = Allowable area of protected openings.
- A_u = Actual area of unprotected openings.
- a_u = Allowable area of unprotected openings.

**TABLE 704.8
MAXIMUM AREA OF EXTERIOR WALL
OPENINGS BASED ON FIRE SEPARATION DISTANCE
AND DEGREE OF OPENING PROTECTION**

FIRE SEPARATION DISTANCE (feet)	0 to less than 3^b			3 to less than 5^{c,d}			5 to less than 10^{d,e}		
DEGREE OF OPENING PROTECTION	UP NS	UP S ^h	P	UP NS	UP S ^h	P	UP NS	UP S ^h	P
ALLOWABLE AREA^a	NP	NP	NP	NP	15%	15%	10% ^g	25%	25%

10 to less than 15^{d,e,f}			15 to less than 20^{e,f}			20 to less than 25^{e,f}		
UP NS	UP S ^h	P	UP NS	UP S ^h	P	UP NS	UP S ^h	P
15% ^g	45%	45%	25%	75%	75%	45%	NL	NL

25 to less than 30^{e,f}			30 or greater		
UP NS	UP S ^h	P	UP NS	UP S ^h	P
70%	NL	NL	NL	NR	NR

For SI: 1 foot = 304.8 mm.

UP, NS = Unprotected openings in buildings not equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.

UP, S = Unprotected openings in buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.

P = Openings protected with an opening protective assembly in accordance with Section 704.8.1.

NP = Not permitted.

NL = No limit

NR = Not required

- Values indicated are the percentage of the area of the exterior wall, per story.
- For the requirements for fire walls of buildings with differing heights, see Section 705.6.1.
- The maximum percentage of unprotected and protected openings shall be 25 percent for Group R-3 occupancies, as applicable in Section 101.2.
- Unprotected openings shall not be permitted for openings with a fire separation distance of less than 15 feet for Group H-2 and H-3 occupancies.
- The area of unprotected and protected openings shall not be limited for Group R-3 occupancies, as applicable in Section 101.2, with a fire separation distance of 5 feet or greater.
- The area of openings in an open parking structure with a fire separation distance of 10 feet or greater shall not be limited.
- Includes buildings accessory to Group R-3, as applicable in Section 101.2.
- Not applicable to Group H-1, H-2 and H-3 occupancies.

704.8.5 Vertical separation of openings. (Text to remain unchanged--former Section 704.9)

704.8.6 Vertical exposure. (Text to remain unchanged--former Section 704.10)

704.9 Joints. (Text to remain unchanged--former Section 704.13)

704.10 Ducts and air transfer openings. (Text to remain unchanged--former Section 704.14)

704.11 Parapets. (Text to remain unchanged--former Section 704.11)

2. Delete without substitution:

~~**704.12 Opening protection.** Windows in exterior walls required to have protected openings in accordance with other sections of this code or determined to be protected in accordance with Section 704.3 or 704.8 shall comply with Section 715.5. Other openings required to be protected with fire door or shutter assemblies in accordance with other sections of this code or determined to be protected in accordance with Section 704.3 or 704.8 shall comply with Section 715.4.~~

~~**Exception:** Opening protectives are not required where the building is protected throughout by an automatic sprinkler system and the exterior openings are protected by an approved water curtain using automatic sprinklers approved for that use. The sprinklers and the water curtain shall be installed in accordance with Section 903.3.1.1 and shall have an automatic water supply and fire department connection.~~

~~**704.12.1 Unprotected openings.** Where protected openings are not required by Section 704, windows and doors shall be constructed of any approved materials. Glazing shall conform to the requirements of Chapters 24 and 26.~~

Reason: This proposal is intended to clarify the provisions for the determination of opening protection requirements in exterior wall construction in a logical and understandable format. Presently, exterior wall opening protection requirements are fragmented in several sections and contain no clear charging language. General opening protection requirements are located in Section 704.12 while more specific allowable area of opening requirements are found in preceding Section 704.8. The latter provisions should be subordinate to the former. For legal purposes a defining charging statement should be provided.

One of the strengths of the International Building Code is the orderly method for the determination of opening protection requirements contained in the fire resistance assembly sections of Chapter 7. For instance, given the requirement for a fire wall, one would go to Section 705 for detailed construction provisions, to include openings at Section 705.8, penetrations at Section 705.9, joints at Section 705.10 and ducts and air transfer openings at Section 705.11. These sections in turn, reference one to the applicable sections for specific details for the various methods of maintaining continuity of construction. This proposal organizes exterior wall opening protection requirements in a similar fashion. This enhances user friendliness and technical accuracy as it supports a consistent procedure for the determination of opening protection requirements throughout Chapter 7.

A general description of the alterations is as follows:

Section 704.8: The section heading is more general and is consistent with Sections 705.8, 706.6, 707.7, 708.6, 709.5 and 710.5. The section provides general charging language for the determination of exterior wall opening protection requirements that is currently not stated.

Section 704.8.1: This specific provision was formally located in Section 704.8. Exception 1 is a generally applicable provision that was formally located in Section 704.8.2. Exception 2 is a generally applicable provision that was formally located in Table 704.8, Footnote i.

Section 704.8.2: This general charging provision is similar to that formally located in Section 704.12. The exception was formerly located in Section 704.12.

Section 704.8.3: This is a generally applicable provision that was formally located in Section 704.12.1.

Section 704.8.4: Minor editorial modifications have been made to the mixed opening provisions, such as, making the equation more simple and better identifying the equation variables.

Table 704.8: The format of Table 704.8 has been modified for purposes of the accurate determination of technical requirements. Perhaps most importantly, horizontal cells under each applicable fire separation distance entry value describe each possible degree of opening protection condition and the allowable area for each such condition. Of particular importance is the introduction of a column recognizing unprotected openings in sprinklered buildings. This provision is currently only contained in the text at Section 704.8.1. Unfortunately, many code users seek requirements in the tables without consulting the charging text. The proposed table would minimize the possibility of erroneously determining the allowable area of unprotected openings in sprinklered buildings--a very common design condition. A subtle feature of the reformatted table is the threshold values for the listed fire separation distances. They have been adjusted to coincide with Table 602. For example, current Table 704.8 specifies a fire distance spread of, "greater than 5 to 10." Conversely, Table 602 references, "equal to or greater than 5 to less than 10." This modification will allow for the correct and relative determination of opening protective assemblies which occur exactly at those threshold fire separation distances. The footnotes have been reorganized to coincide with the increasing fire separation distances. Numerous minor editorial changes have been made to clarify the understanding of technical intent (i.e. No Limit to No Requirement for protected openings greater than 30 feet).

Sections 704.8.5 and 704.8.6: Both sections which are applicable to openings in exterior walls have been incorporated into Section 704.8 (openings). These provisions were formerly located at Sections 704.9 and 704.10, respectively.

Sections 704.9 through 704.11: The remaining sections have been reorganized to be consistent with the continuity provisions of the other fire-resistance rated assembly sections. These provisions were formerly located at Sections 704.13, 704.14 and 704.11, respectively.

In summary, the proposed submittal will clarify the intent of the International Building Code by providing a logical organization of technical requirements while using accepted terminology and format. As previously stated, the proposal is not intended to achieve any technical changes. The proposed technical reorganization and language contained in this submittal would represent a significant improvement to the 2009 Edition of the International Building Code in this important and frequently applicable area.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Modified

Modify the proposal as follows:

Table 704.8 footnotes:

P = Openings protected with an opening protective assembly in accordance with Section ~~704.8.1~~ 704.8.2.

(Portions of proposal not shown remain unchanged)

Committee Reason: This provides a clear connection between Table 704.8 and the code text which currently exists in Section 704.8.1. The modifications will correct a section reference which is not correct. The committee also expressed their desire that the various headings be spelled out instead of abbreviated. Additionally the action taken with FS22-06/07 will be added into this table if both of the items do get approved at the final action hearings.

Assembly Action:

None

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Maureen Traxler, City of Seattle Department of Planning and Development, requests Approval as Modified by this public comment.

Further modify proposal as follows:

704.8 Openings. Openings in exterior walls shall ~~have a degree of opening protection based on the fire separation distance as specified in Table 704.8~~ comply with Sections 704.8.1 through 704.8.6.

704.8.1 Allowable area of openings. The maximum area of unprotected and protected openings permitted in an exterior wall in any story of a building shall not exceed the percentages specified in Table 704.8.

Exceptions:

1. In other than Group H occupancies, unlimited unprotected openings are permitted in the ~~exterior walls of the~~ first story above grade ~~that~~ facing either:
 - 1.1. Where the wall either faces a street ~~that~~ and has a fire separation distance of ~~greater~~ more than 15 feet (4572 mm); or
 - 1.2. Where the wall faces ~~facing~~ an unoccupied space. ~~Such~~ The unoccupied space shall be on the same lot or dedicated for public use, shall not be less than 30 feet (9144 mm) in width, and shall have access from a street by a posted fire lane in accordance with the *International Fire Code*.
2. Buildings whose exterior bearing walls, exterior nonbearing walls and exterior structural frame are not required to be fire-resistance rated shall be permitted to have unlimited unprotected openings.

704.8.2 Protected openings. Where openings are required to be protected, fire doors and fire shutters shall comply with Section 715.4 and fire window assemblies shall comply with Section 715.5.

Exception: Opening protective assemblies are not required where the building is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 and the exterior openings are protected by a water curtain using automatic sprinklers approved for that use.

(Portions of proposal not shown remain unchanged)

Commenter's Reason: This comment proposes only editorial modifications. The charging language in Section 704.8 is revised to more accurately describe the scope of the section. The reference to Table 704.8 is misplaced in Section 704.8 because the table is only one of the requirements in the section, and because the table is referenced again in Section 704.8.1.

As proposed, exception 1 states that the street is required to have a fire separation distance; the modification clarifies that the wall is required to have a fire separation distance. The phrase "exterior walls" is deleted from exception 1 because that's the subject of the entire section, and opening protection isn't required anywhere else. Other edits are intended to make the exception read more clearly.

In Section 704.8.2, it is the openings that are required to be protected; fire doors and shutters are the method of protecting the openings.

Editor's note: The phrase "as applicable in Section 101.2" has been deleted from Table 704.8 Footnotes C, E and G of the original proposal. During the previous code cycle the Code Correlating Committee took action to delete this phrase from the IBC since it is not necessary. Therefore this phrase will not be added back into the code as a part of proposal FS24-06/07.

Final Hearing Results

FS24-06/07

AMPC1

Code Change No: FS25-06/07

Original Proposal

Section: 704.10

Proponent: Philip Brazil, P.E., Reid Middleton, Inc., representing himself

704.10 Vertical exposure. For buildings on the same lot, opening protectives having a fire protection rating of not less than 3/4 hour shall be provided in every opening that is less than 15 feet (4572 mm) vertically above the roof of an ~~adjacent adjoining~~ building or ~~adjacent~~ structure ~~that is within a horizontal~~ based on assuming an imaginary line between them. ~~The opening protectives are required where the fire separation distance of between the imaginary line and the adjacent building or structure is less than 15 feet (4572 mm) of the wall in which the opening is located.~~ Application of the exception to Section 704.3 for two or more buildings on the same lot as portions of one building is not permitted.

Exception: Opening protectives are not required where the roof construction of the adjacent building or structure has a fire-resistance rating of not less than 1 hour for a minimum distance of 10 feet (3048 mm) from the adjoining building exterior wall facing the imaginary line and the entire length and span of the supporting elements for the fire-resistance-rated roof assembly has a fire-resistance rating of not less than 1 hour. Application of the exception to Section 704.3 for two or more buildings on the same lot as portions of one building is permitted.

Reason: The purpose of this proposal is to correct technical flaws in the current provisions on vertical exposure of the exterior walls of a building by an adjacent (lower) building or structure. The threshold for requiring opening protection is a horizontal fire separation distance of less than 15 feet. By definition (see Section 702.1), fire separation distance is measured from a building face to an interior lot line, the centerline of a public way, or an imaginary line between two buildings on the same lot. The current language does not establish the existence of an imaginary line from which to measure fire separation distance.

It is possible that an imaginary line could exist between the buildings. Section 704.3 requires the assumption of an imaginary line between two adjacent buildings on the same lot for the purpose of determining required wall and opening protection and roof covering requirements. The exception to Section 704.3, however, permits two or more buildings on the same lot to be considered portions of one building making the presence of an imaginary line moot.

The threshold for requiring opening protection in Section 704.10 is also a single horizontal fire separation distance of less than 15 feet. Since fire separation distance is measured between the faces of two buildings on the same lot and an imaginary line between them, there are always two fire separation distances, not just one fire separation distance. It is not clear from the current language which one of the fire separation distances is intended.

The proposal corrects these and other technical flaws by establishing the presence of an imaginary line between the buildings and by basing the requirement for opening protection on the fire separation distance between the imaginary line and the adjacent (lower) building or structure. Establishing an imaginary line eliminates the option of considering the buildings as portions of one building, which is permitted by the exception to Section 704.3. Instead, the fire separation distance between the imaginary line and higher building must be considered and fire resistance and opening protection will be required at the exterior wall of the higher building based on that fire separation distance (see Section 704.3). Consequently, opening protection may be required at areas of the exterior wall other than required by Section 704.10. It is also conceivable that opening protection may be prohibited or limited in area based on the more severe of the provisions in Sections 704.3 and 704.10. A sentence is added at the end of Section 704.10 making it clear that the exception to Section 704.3 is not permitted to be used in this case.

In the exception to Section 704.10, “of the adjacent building or structure” is added because it is not clear from the current language which roof construction is intended: the higher building or the adjacent (lower) building or structure. Also, “adjoining building” is replaced by “exterior wall facing the imaginary line” because the current language literally requires the roof construction of one of the buildings (which one is not clear) to be 1-hour fire-resistance-rated for a distance of 10 feet from the adjoining building, which could apply to the fire separation distance and not to any portion of the roof construction of either building.

The exception to Section 704.10 intends to exempt the requirements for opening protectives at the higher building provided the roof of the adjacent (lower) building or structure is 1-hour fire-resistance-rated for at least 10 feet from the exterior wall facing the imaginary line. If this exception is employed, it is reasonable to permit the exception to Section 704.3 permitting two or more buildings on the same lot to be considered as portions of the same building to also be employed. The proposal adds language making this clear.

The reference to “horizontal” for fire separation distance is deleted for consistency with use of “fire separation distance” without reference to “horizontal” elsewhere in the code (i.e., Section 704.5 and Table 704.8).

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The proponent requested disapproval so that he could continue to work with others to resolve some concerns. Additionally the committee did note that the last sentence of Section 704.10 was not clear.

Assembly Action:

None

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Philip Brazil, Reid Middleton, Inc. representing himself, requests Approval as Modified by this public comment.

Replace proposal with the following:

704.10 Vertical exposure. For buildings on the same lot, opening protectives having a fire protection rating of not less than 3/4 hour shall be provided in every opening that is less than 15 feet (4572 mm) vertically above the roof of an ~~adjacent~~ adjoining building or ~~adjacent~~ structure ~~that is within a horizontal based on assuming an imaginary line between them.~~ The opening protectives are required where the fire separation distance of ~~between the imaginary line and the adjacent building or structure is less than~~ 15 feet (4572 mm) ~~of the wall in which the opening is located.~~

Exceptions:

1. Opening protectives are not required where the roof construction of ~~the adjacent building or structure~~ has a fire-resistance rating of not less than 1 hour for a minimum distance of 10 feet (3048 mm) from the ~~adjoining building exterior wall facing the imaginary line~~ and the entire length and span of the supporting elements for the fire-resistance-rated roof assembly has a fire-resistance rating of not less than 1 hour.
2. Buildings on the same lot and considered as portions of one building in accordance with Section 704.3 are not required to comply with Section 704.10.

Commenter's Reason: The public comment revises the original proposal by establishing that buildings on the same lot and considered as portions of one building in accordance with Section 704.3 are exempt from the requirements of Section 704.10. The original proposal prohibited application of the exception to Section 704.3 for buildings on the same lot from the basic requirement of Section 704.10, but permitted its application when compliance with the exception to Section 704.10 is chosen over the basic requirement. This public comment recognizes that the concept behind the exception to Section 704.3 is equally valid when applying the requirements of Section 704.10.

The exception to Section 704.3 permitting two buildings on the same lot to be considered as portions of the same building recognizes that two such buildings pose no greater hazard to the occupants than if they were combined into a single building of equivalent building area and building height. In the case of Section 704.3, the hazard to each building is fire exposure from the exterior wall of the opposite building. In the case of Section 704.10, the hazard to the higher building is fire exposure from the roof of the opposite (lower) building. Two buildings on the same lot that qualify for exemption from the requirements of Section 704.3 should also be permitted to qualify for exemption from the requirements of Section 704.10

Final Hearing Results

FS25-06/07

AMPC1

Code Change No: **FS29-06/07**

Original Proposal

Section: 705.5.1

Proponent: Philip Brazil, P.E., Reid Middleton, Inc., representing himself

705.5.1 Exterior walls. Where the fire wall ~~intersects the~~ terminates within an exterior walls ~~the fire-resistance rating for the exterior walls on both sides of the fire wall shall have a 1-hour fire-resistance rating with 3/4-hour opening protection where opening protection is required. The fire-resistance rating of the exterior wall shall extend a minimum of 4 feet (1220 mm) on each side of the intersection of the fire wall to exterior wall as permitted by Section 705.5, the buildings on either side of the fire wall shall be assumed to have an imaginary line between them. The location of the assumed imaginary line shall be such that the exterior wall and opening protection of each building shall comply with the criteria set forth in Sections 704.5 and 704.8. Such protection is not required for exterior walls intersections terminating at fire walls that form an angle equal to or greater than 180 degrees (3.14 rad) ~~do not need exterior wall protection.~~~~

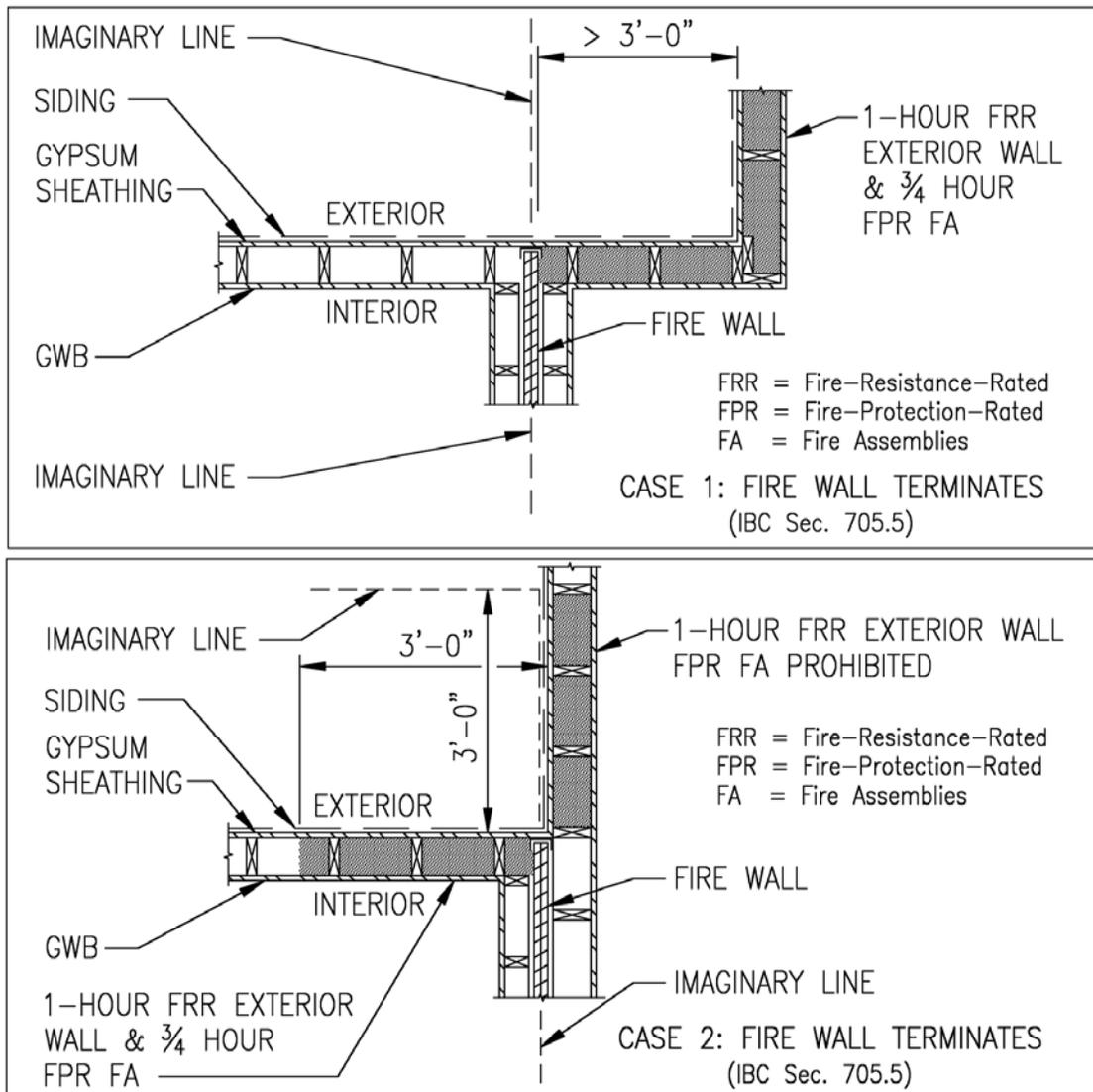
CODE CHANGES RESOURCE COLLECTION – INTERNATIONAL BUILDING CODE

Reason: Section 705.1 states that each portion of a building separated by one or more fire walls complying with Section 705 shall be considered a separate building. Section 704.3 states that buildings on the same lot shall be assumed to have an imaginary line between them. This imaginary line is employed in the same fashion as a lot line is used between buildings on adjoining lots. It determines the required fire resistance and opening protection of exterior walls at buildings on the same lot. This approach is equally valid at portions of buildings considered separate buildings due to the presence of a fire wall. The purpose of this proposal is to establish requirements for the protection of exterior walls on either side of fire walls that are comparable to the requirements for buildings on the same lot.

The proposal also addresses several problematic aspects of the current provisions. Section 705.5.1 applies to exterior walls intersected by fire walls, not exterior walls where fire walls are permitted to terminate. Consequently, the current requirements are limited to the basic case of horizontal continuity: extension of the fire wall at least 18 inches beyond the exterior surface of the exterior walls. The current requirements do not apply when the exceptions to Section 705.5 are employed, which permit termination within the exterior wall (i.e., interior surface of exterior sheathing). The hazard addressed by Section 705.5.1, however, is more evident when the exceptions to Section 705.5 are employed rather than the basic case.

Determining the fire-resistance rating and opening protection of the exterior wall “where opening protection is required” is also problematic. The protection ought to be based on the proximity of the exterior wall on one side of the fire wall to the exterior wall on the other side of the fire wall, which is moot when the exterior angle formed by the exterior walls is equal or greater than 180 degrees.

The accompanying diagrams illustrate applications of the proposed changes requiring fire-resistance-rated construction at the exterior wall on either side of the fire wall but also permitting openings at certain fire separation distances from the imaginary line provided they are 3/4-hour fire-protection-rated assemblies. Once permitted, the allowable percentage of fire-protection-rated would be small at small fire separation distances, increasing at larger distances until unprotected openings are permitted.



Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Modified

Further modify proposal as follows:

705.5.1 Exterior walls. Where the fire wall terminates within an exterior wall as permitted by Section 705.5, the buildings on either side of the fire wall shall be assumed to have an imaginary line between them. The location of the assumed imaginary line shall be such that the exterior wall and opening protection of each building shall comply with the criteria set forth in Sections 704.5 and 704.8. Such protection is not required for exterior walls terminating at fire walls that form an angle equal to or greater than 180 degrees (3.14 rad).

Committee Reason: This proposal helps explain how to deal with these items where the fire wall terminates at the exterior wall.

Analysis: This item needs to be reviewed based on the committee's later action to approve FS31-06/07. Without public comments, there will be coordination issues, see FS31.

Assembly Action:

None

Final Hearing Results

FS29-06/07

AM

Code Change No: FS31-06/07

Original Proposal

Section: 705.5.1

Proponent: Peter Bemelen, PE, City and County of Denver, representing Colorado Chapter ICC

Delete and substitute as follows:

~~**705.5.1 Exterior walls.** Where the fire wall intersects the exterior walls, the fire-resistance rating for the exterior walls on both sides of the fire wall shall have a 1-hour fire-resistance rating with 3/4-hour opening protection where opening protection is required. The fire-resistance rating of the exterior wall shall extend a minimum of 4 feet (1220 mm) on each side of the intersection of the firewall to exterior wall. Exterior wall intersections at fire walls that form an angle equal to or greater than 180 degrees (3.14 rad) do not need exterior wall protection.~~

705.5.1 Exterior walls. Where the fire wall intersects exterior walls, the fire-resistance rating and opening protection of the exterior walls shall comply with one of the following:

1. The exterior walls on both sides of the fire wall shall have a 1-hour fire-resistance rating with ¾ hour protection where opening protections is required by Section 704.8 The fire-resistance rating of the exterior wall shall extend a minimum of 4 feet (1220 mm) on each side of the intersection of the firewall to exterior wall. Exterior wall intersections at fire walls that form an angle equal to or greater than 180 degrees (3.14 rad) do not need exterior wall protection.
2. Buildings or spaces on both sides of the intersecting firewall shall assume to have an imaginary lot line at the firewall and extending beyond the exterior of the firewall. The location of the assumed line in relation to the exterior walls and the firewall shall be such that the exterior wall and opening protection meet the requirements set forth in Section 704.5 and 704.8.

Reasons: Add flexibility to the provision. Add alternate method

The proposed language adds an alternate method to Section 705.5.1 by adding a similar application as allowed Section 704.3 by inclusion of assumed property lines for determination of exterior wall and opening protections. This application will add flexibility to the design and still meets the intent of the present code section, that is to prevent the spread of fire and smoke to the adjacent building at the fire wall. For example, a fire wall terminating at exterior walls that intersect at 90 degrees from each other, with construction type of II-B, would allow one exterior wall to have a one hour fire resistance rating without any openings for 10 ft and the other exterior wall and openings to be unprotected.

The proposed method has been an acceptable method for many years and presently is allowed per section 704.3 under similar circumstances.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: This proposal provides a better clarification for how to handle walls which are at an angle greater than 180 degrees. This item needs to be reviewed based on the previous action to approve FS29-06/07.

Analysis: Public comments may be needed to coordinate FS29 and FS31 and address any inconsistencies or conflicts which may result if both items are approved. Some committee members expressed that they liked the numbered list that this proposal provided as compared to FS29.

Assembly Action:

None

Final Hearing Results

FS31-06/07

AS

Code Change No: FS32-06/07

Original Proposal

Section: 705.6

Proponent: Maureen Traxler, City of Seattle, representing Washington Association of Building Officials

Revise as follows:

705.6 Vertical continuity. Fire walls shall extend from the foundation to a termination point at least 30 inches (762 mm) above both adjacent roofs.

Exceptions:

1. Stepped buildings in accordance with Section 705.6.1.
2. Two-hour fire-resistance-rated walls shall be permitted to terminate at the underside of the roof sheathing, deck or slab provided:
 - 2.1. The lower roof assembly within 4 feet (1220 mm) of the wall has not less than a 1-hour fire-resistance rating and the entire length and span of supporting elements for the rated roof assembly has a fire-resistance rating of not less than 1 hour.
 - 2.2. Openings in the roof shall not be located within 4 feet (1220 mm) of the fire wall.
 - 2.3. Each building shall be provided with not less than a Class B roof covering.
3. Walls shall be permitted to terminate at the underside of noncombustible roof sheathing, deck, or slabs where both buildings are provided with not less than a Class B roof covering. Openings in the roof shall not be located within 4 feet (1220 mm) of the fire wall.
4. In buildings of Type III, IV and V construction, walls shall be permitted to terminate at the underside of combustible roof sheathing or decks provided:
 - 4.1. There are no openings in the roof within 4 feet (1220 mm) of the fire wall,
 - 4.2. The roof is covered with a minimum Class B roof covering, and
 - 4.3. The roof sheathing or deck is constructed of fire-retardant-treated wood for a distance of 4 feet (1220 mm) on both sides of the wall or the roof is protected with 5/8 inch (15.9 mm) Type X gypsum board directly beneath the underside of the roof sheathing or deck, supported by a minimum of 2-inch (51 mm) nominal ledgers attached to the sides of the roof framing members for a minimum distance of 4 feet (1220 mm) on both sides of the fire wall.
5. ~~Buildings located above a parking garage designed in accordance with Section 509.2 shall be permitted to have the fire walls for the buildings located above the parking garage extend from the horizontal separation between the parking garage and the buildings.~~

Reason: The purpose of the proposed code change is to delete an unnecessary paragraph. Exception 5 is unnecessary because Section 509.2 clearly states that the basement or first story is treated as a separate building for the purpose of continuity of fire walls. IBC Section 509.2

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Modified

Modify the existing code as follows:

705.6 Vertical continuity. Fire walls shall extend from the foundation to a termination point at least 30 inches (762 mm) above both adjacent roofs.

Exceptions:

1. Stepped buildings in accordance with Section 705.6.1.
2. Two-hour fire-resistance-rated walls shall be permitted to terminate at the underside of the roof sheathing, deck or slab provided:
 - 2.1. The lower roof assembly within 4 feet (1220 mm) of the wall has not less than a 1-hour fire-resistance rating and the entire length and span of supporting elements for the rated roof assembly has a fire-resistance rating of not less than 1 hour.
 - 2.2. Openings in the roof shall not be located within 4 feet (1220 mm) of the fire wall.
 - 2.3. Each building shall be provided with not less than a Class B roof covering.
3. Walls shall be permitted to terminate at the underside of noncombustible roof sheathing, deck, or slabs where both buildings are provided with not less than a Class B roof covering. Openings in the roof shall not be located within 4 feet (1220 mm) of the fire wall.
4. In buildings of Type III, IV and V construction, walls shall be permitted to terminate at the underside of combustible roof sheathing or decks provided:
 - 4.1. There are no openings in the roof within 4 feet (1220 mm) of the fire wall,
 - 4.2. The roof is covered with a minimum Class B roof covering, and
 - 4.3. The roof sheathing or deck is constructed of fire-retardant-treated wood for a distance of 4 feet (1220 mm) on both sides of the wall or the roof is protected with 5/8 inch (15.9 mm) Type X gypsum board directly beneath the underside of the roof sheathing or deck, supported by a minimum of 2-inch (51 mm) nominal ledgers attached to the sides of the roof framing members for a minimum distance of 4 feet (1220 mm) on both sides of the fire wall.
5. In buildings located above a parking garage designed in accordance with Section 509.2, shall be permitted to have the fire walls for the buildings located above the parking garage 3 hour fire rated horizontal separation required by Section 509.2 item 1 shall be permitted to extend from the top of this horizontal separation between the parking garage and the buildings.

Committee Reason: The modification which was submitted and approved does help to clarify the application of these provisions. The changes by the proposal and modification are essentially editorial changes and do not intend to make technical changes to the requirements. The intent is to simply clarify the termination of the fire wall at the horizontal separation or "pedestal" and also address the fact that uses other than garages are permitted below the horizontal separation.

Assembly Action:

None

Final Hearing Results

FS32-06/07

AM

Code Change No: FS33-06/07

Original Proposal

Section: 705.8

Proponent: Joseph R. Hetzel, P.E., Door & Access Systems Manufacturers Association

Revise as follows:

705.8 Openings. Each opening through a fire wall shall be protected in accordance with Section 715.4 and shall not exceed ~~420~~ 156 square feet (~~44~~ 15 m²). The aggregate width of openings at any floor level shall not exceed 25 percent of the length of the wall.

Exceptions:

1. Openings are not permitted in party walls constructed in accordance with Section 705.1.1.
2. Openings shall not be limited to ~~420~~ 156 square feet (~~44~~ 15 m²) where both buildings are equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1.

Reason: The purpose of this proposed code change is to coordinate the provisions of Section 706.6 with Section 705.8, as they relate to maximum opening size. The maximum opening size as specified in Section 706.6 was changed from 120 SF to 156 SF via ICC code change proposal FS27-04/05.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: These new size limitations are appropriate based on changes in the test standards and help provide consistency with the requirements in Section 706.7.

Assembly Action:

None

Final Hearing Results

FS33-06/07

AS

Code Change No: FS34-06/07

Original Proposal

Section: 705.11

Proponent: Vickie Lovell, Delray, FL, representing Air Movement and Control Association and 3M Company

Revise as follows:

705.11 Ducts and air transfer openings. Ducts and air transfer openings shall not penetrate fire walls.

Exception: Penetrations by ducts and air transfer openings of fire walls that are not on a lot line shall be allowed provided the penetrations comply with Sections ~~712 and 716.5.1~~. The size and aggregate width of all openings shall not exceed the limitations of Section 705.8.

Reason: The protection of ducts is not a compliance option between Sections 712 and 716. The specific requirements for duct protection requirements are located in 716, not 712. Under certain conditions the code may direct the user to back to 712, or other sections of the code which permit a percentage of unprotected openings based on separation distance, but the starting point is in Section 716.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Modified

Modify the proposal as follows:

705.11 Ducts and air transfer openings. Ducts and air transfer openings shall not penetrate fire walls.

Exception: Penetrations by ducts and air transfer openings of fire walls that are not on a lot line shall be allowed provided the penetrations comply with Section ~~716.5.4~~. The size and aggregate width of all openings shall not exceed the limitations of Section 705.8.

Committee Reason: This helps to clarify the application of the fire wall provisions and direct the code user to the requirements of Section 716 which do require dampers at these locations. The modification changed the reference to Section 716 instead of Section 716.5.1 since that section does not really provide any added clarity and it would miss the provisions of Section 716.2, 716.3 and 716.4 that are also applicable.

Assembly Action:

None

Final Hearing Results

FS34-06/07

AM

Code Change No: **FS36-06/07**

Original Proposal

Sections: 706.2.1, 703.5 (New)

Proponent: William E. Koffel, P.E., Koffel Associates, Inc., representing Fire Rated Glazing Industry

1. Delete without substitution:

~~**706.2.1 Fire-resistance-rated glazing.** Fire-resistance-rated glazing, when tested in accordance with ASTM E 119 and complying with the requirements of Section 706, shall be permitted. Fire-resistance-rated glazing shall bear a label or other identification showing the name of the manufacturer, the test standard and the identifier "W-XXX," where the "XXX" is the fire-resistance rating in minutes. Such label or identification shall be issued by an approved agency and shall be permanently affixed to the glazing.~~

2. Add new text as follow:

706.2.1 703.5 Fire-resistance-rated glazing. Fire-resistance-rated glazing, when tested in accordance with ASTM E 119 and complying with the requirements of Section 706, shall be permitted. Fire-resistance-rated glazing shall bear a label or other identification showing the name of the manufacturer, the test standard and the identifier "W-XXX," where the "XXX" is the fire-resistance rating in minutes. Such label or identification shall be issued by an approved agency and shall be permanently affixed to the glazing.

Reason: Fire resistance rated glazing may be used in fire barriers, fire partitions, and exterior wall assemblies. The current location in the Code implies that fire resistance rated glazing may only be used in fire barriers. Moving the text to Section 703 will clarify that fire resistance rated glazing may be used in assemblies other than fire barriers.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The relocation to Section 703 will assist code users in understanding that the requirements are applicable to more than fire barriers.

Assembly Action:

None

Final Hearing Results

FS36-06/07

AS

Code Change No: **FS37-06/07**

Original Proposal

Sections: 402.4.6, 402.7.1, 403.2, [F]404.3, 410.5.1, 410.5.2, [F]415.6.1.2, [F]415.6.2.2, [F]415.6.3.4.1, [F]415.6.3.5.2, [F]415.7.1, [F]415.7.3, [F]415.8.2.2, 415.8.5.2.1, 415.8.5.2.2, [F]416.2, [F]418.4, [F]418.5, [F]418.6, 706.3.3, 706.3.9, Table 706.3.9, 707.11, 707.13.3, 707.13.4, 712.3, 901.7, 903.2, [F]909.11 (IMC 513.11 & IFC 909.11), 909.20.2, 909.20.6.1, [F]910.3.4, [F]910.4.4, 1021.3 (IFC [B] 1021.3), 1022.2 (IFC [B] 1022.2) 3006.4, 3104.5, 3410.6.16.1 (IEBC [B] 1301.6.16.1)

Proponent: Philip Brazil, P.E, Reid Middleton, Inc., representing himself

THIS PROPOSAL IS ON THE AGENDA OF THE IBC FIRE SAFETY, IBC GENERAL AND IBC MEANS OF EGRESS AND IFC CODE DEVELOPMENT COMMITTEES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IBC FIRE SAFETY

706.3.3 Exit passageway. The fire-resistance rating of the ~~separation between~~ fire barrier separating building areas ~~and from~~ an exit passageway shall comply with Section ~~1021.4~~ 1021.3.

706.3.9. Single-occupancy fire areas. The fire barriers or horizontal ~~assembly~~ assemblies, or both, separating a single occupancy into different fire areas shall have a fire-resistance rating of not less than that indicated in Table 706.3.9.

707.11 Enclosure at the bottom. Shafts that do not extend to the bottom of the building or structure shall comply with one of the following:

1. They shall be enclosed at the lowest level with construction of the same fire-resistance rating as the lowest floor through which the shaft passes, but not less than the rating required for the shaft enclosure; ~~;~~
2. They shall terminate in a room having a use related to the purpose of the shaft. The room shall be separated from the remainder of the building by a fire barriers constructed in accordance with Section 706 or horizontal assemblies constructed in accordance with Section 711, or both. ~~having a~~ The fire-resistance rating and opening protectives shall be at least equal to the protection required for the shaft enclosure; ~~or.~~
3. They shall be protected by approved fire dampers installed in accordance with their listing at the lowest floor level within the shaft enclosure.

Exceptions:

1. The fire-resistance-rated room separation is not required, provided there are no openings in or penetrations of the shaft enclosure to the interior of the building except at the bottom. The bottom of the shaft shall be closed off around the penetrating items with materials permitted by Section 717.3.1 for draftstopping, or the room shall be provided with an approved automatic fire suppression system.
2. A shaft enclosure containing a refuse chute or laundry chute shall not be used for any other purpose and shall terminate in a room protected in accordance with Section 707.13.4.
3. The fire-resistance-rated room separation and the protection at the bottom of the shaft are not required provided there are no combustibles in the shaft and there are no openings or other penetrations through the shaft enclosure to the interior of the building.

707.13.3 Refuse and laundry chute access rooms. Access openings for refuse and laundry chutes shall be located in rooms or compartments enclosed by a not less than 1-hour fire barriers constructed in accordance with Section 706 or horizontal assemblies constructed in accordance with Section 711, or both ~~that has a fire-resistance rating of not less than 1 hour.~~ Openings into the access rooms shall be protected by opening protectives having a fire protection rating of not less than 3/4 hour. Doors shall be self- or automatic closing upon the detection of smoke in accordance with Section 715.4.7.3.

707.13.4 Termination room. Refuse and laundry chutes shall discharge into an enclosed room separated from the remainder of the building by a not less than 1-hour fire barriers constructed in accordance with Section 706 or horizontal assemblies constructed in accordance with Section 711, or both ~~that has a fire-resistance rating of not less than 1 hour~~. Openings into the termination room shall be protected by opening protectives having a fire protection rating of not less than 3/4 hour. Doors shall be self- or automatic closing upon the detection of smoke in accordance with Section 715.4.7.3. Refuse chutes shall not terminate in an incinerator room. Refuse and laundry rooms that are not provided with chutes need only comply with Table 508.2.

712.3 Fire-resistance-rated walls. Penetrations into or through fire walls, fire barriers ~~walls~~, smoke barrier walls, and fire partitions shall comply with Sections 712.3.1 through 712.3.4.

901.7 Fire areas. Where buildings, or portions thereof, are divided into fire areas so as not to exceed the limits established for requiring a fire protection system in accordance with this chapter, such fire areas shall be separated by fire barriers constructed in accordance with Section 706 or horizontal assemblies constructed in accordance with Section 711, or both having a fire-resistance rating of not less than that determined in accordance with Section 706.3.9.

[B] 909.20.2 Construction. The smokeproof enclosure shall be separated from the remainder of the building by not less than a 2-hour fire barriers constructed in accordance with Section 706 or horizontal assemblies constructed in accordance with Section 711, or both. ~~without~~ Openings are not permitted other than the required means of egress doors. The vestibule shall be separated from the stairway by not less than a 2-hour fire barriers constructed in accordance with Section 706 or horizontal assemblies constructed in accordance with Section 711, or both. The open exterior balcony shall be constructed in accordance with the fire-resistance-rating requirements for floor construction.

[B] 909.20.6.1 Ventilation systems. Smokeproof enclosure ventilation systems shall be independent of other building ventilation systems. The equipment and ductwork shall comply with one of the following:

1. Equipment and ductwork shall be located exterior to the building and directly connected to the smokeproof enclosure or connected to the smokeproof enclosure by ductwork enclosed by not less than 2-hour fire barriers constructed in accordance with Section 706 or horizontal assemblies constructed in accordance with Section 711, or both.
2. Equipment and ductwork shall be located within the smokeproof enclosure with intake or exhaust directly from and to the outside or through ductwork enclosed by not less than 2-hour fire barriers constructed in accordance with Section 706 or horizontal assemblies constructed in accordance with Section 711, or both.
3. Equipment and ductwork shall be located within the building if separated from the remainder of the building, including other mechanical equipment, by not less than 2-hour fire barriers constructed in accordance with Section 706 or horizontal assemblies constructed in accordance with Section 711, or both.

PART II – IBC GENERAL

Revise as follows:

402.4.6 Service areas fronting on exit passageways. Mechanical rooms, electrical rooms, building service areas and service elevators are permitted to open directly into exit passageways, provided the exit passageway is separated from such rooms with not less than 1-hour ~~fire-resistance-rated~~ fire barriers ~~and 1-hour opening protectives~~ constructed in accordance with Section 706 or horizontal assemblies constructed in accordance with Section 711, or both. The minimum fire-protection rating of openings in the fire barriers shall be 1 hour.

402.7.1 Attached garage. An attached garage for the storage of passenger vehicles having a capacity of not more than nine persons and open parking garages shall be considered as a separate building where it is separated from the covered mall building by a not less than 2-hour fire barriers ~~having a fire-resistance rating of at least 2 hours~~ constructed in accordance with Section 706 or horizontal assemblies constructed in accordance with Section 711, or both.

Exception: Where an open parking garage or enclosed parking garage is separated from the covered mall building or anchor building a distance greater than 10 feet (3048 mm), the provisions of Table 602 shall apply. Pedestrian walkways and tunnels which attach the open parking garage or enclosed parking garage to the covered mall building or anchor building shall be constructed in accordance with Section 3104.

410.5.1 Separation from stage. ~~Where the stage height is greater than 50 feet (15 240 mm), The stage shall be separated from dressing rooms, scene docks, property rooms, workshops, storerooms and compartments appurtenant to the stage and other parts of the building by a fire barriers with not less than a 2-hour fire-resistance rating with approved opening protectives constructed in accordance with Section 706 or horizontal assemblies constructed in accordance with Section 711, or both. The minimum fire-resistance rating shall be 2 hours for stage heights greater than 50 feet (15 240 mm) and 1 hour for stage heights of 50 feet (15 240 mm) or less, the required stage separation shall be a fire barrier with not less than a 1-hour fire-resistance rating with approved opening protectives.~~

410.5.2 Separation from each other. Dressing rooms, scene docks, property rooms, workshops, storerooms and compartments appurtenant to the stage shall be separated from each other by not less than 1-hour fire barriers with not less than a 1-hour fire-resistance rating with approved opening protectives constructed in accordance with Section 706 or horizontal assemblies constructed in accordance with Section 711, or both.

3006.4 Machine rooms and machinery spaces. Elevator machine rooms and machinery spaces shall be enclosed with fire barriers constructed in accordance with Section 706 or horizontal assemblies constructed in accordance with Section 711, or both with a The fire-resistance rating shall not be less than the required rating of the hoistway enclosure served by the machinery. Openings in the fire barriers shall be protected with assemblies having a fire protection rating not less than that required for the hoistway enclosure doors.

3104.5 Fire barriers between pedestrian walkways and buildings. Walkways shall be separated from the interior of the building by not less than 2-hour fire barriers walls with a fire-resistance rating of not less than 2-hours constructed in accordance with Section 706 or horizontal assemblies constructed in accordance with Section 711, or both. This protection shall extend vertically from a point 10 feet (3048 mm) above the walkway roof surface or the connected building roof line, whichever is lower, down to a point 10 feet (3048 mm) below the walkway and horizontally 10 feet (3048 mm) from each side of the pedestrian walkway. Openings within the 10-foot (3048 mm) horizontal extension of the protected walls beyond the walkway shall be equipped with devices providing a 3/4-hour fire protection rating in accordance with Section 715.

Exception: The walls separating the pedestrian walkway from a connected building are not required to have a fire-resistance rating by this section where any of the following conditions exist:

1. The distance between the connected buildings is more than 10 feet (3048 mm), the pedestrian walkway and connected buildings, except for open parking garages, are equipped throughout with an automatic sprinkler system in accordance with ~~NFPA 13~~ Section 903.3.1.1 and the wall is constructed of a tempered, wired or laminated glass wall and doors subject to the following:
 - 1.1. The glass shall be protected by an automatic sprinkler system in accordance with ~~NFPA 13~~ Section 903.3.1.1 and the sprinkler system shall completely wet the entire surface of interior sides of the glass wall when actuated.
 - 1.2. The glass shall be in a gasketed frame and installed in such a manner that the framing system will deflect without breaking (loading) the glass before the sprinkler operates.
 - 1.3. Obstructions shall not be installed between the sprinkler heads and the glass.
2. The distance between the connected buildings is more than 10 feet (3048 mm) and both sidewalls of the pedestrian walkway are at least 50 percent open with the open area uniformly distributed to prevent the accumulation of smoke and toxic gases.
3. Buildings are on the same lot in accordance with Section 503.1.2.
4. Where exterior walls of connected buildings are required by Section 704 to have a fire-resistance rating greater than 2 hours, the walkway shall be equipped throughout with an automatic sprinkler system installed in accordance with ~~NFPA 13~~ Section 903.3.1.1.

3410.6.16.1 (IEBC [B] 1301.6.16.1) Categories. The categories for mixed occupancies are:

1. Category a — ~~Minimum 1-hour fire barriers between~~ Occupancies separated by minimum 1-hour fire barriers or minimum 1-hour horizontal assemblies, or both.
2. Category b — ~~Fire barriers~~ Separations between occupancies in accordance with Section 508.3.3.
3. Category c — ~~Fire barriers~~ Separations between occupancies having a fire-resistance rating of not less than twice that required by Section 508.3.3.

PART III – IBC MEANS OF EGRESS

1021.3 (IFC 1021.3) Construction. Exit passageway enclosures shall have walls, floors and ceilings of not less than 1-hour fire-resistance rating, and not less than that required for any connecting exit enclosure. Exit passageways shall be constructed as fire barriers in accordance with Section 706 or horizontal assemblies constructed in accordance with Section 711, or both.

1022.2 (IFC 1022.2) Separation. The separation between buildings or areas of refuge connected by a horizontal exit shall be provided by a fire wall complying with Section 705; or it shall be provided by a fire barrier complying with Section 706 or a horizontal assembly complying with Section 711, or both, and having a ~~The minimum~~ fire-resistance rating of ~~not less than the separation shall be~~ 2 hours. Opening protectives in horizontal exit walls shall also comply with Section 715. The horizontal exit separation shall extend vertically through all levels of the building unless floor assemblies have a fire resistance rating of not less than 2 hours with no unprotected openings.

Exception: A fire-resistance rating is not required at horizontal exits between a building area and an above-grade pedestrian walkway constructed in accordance with Section 3104, provided that the distance between connected buildings is more than 20 feet (6096 mm).

Horizontal exit walls constructed as fire barriers shall be continuous from exterior wall to exterior wall so as to divide completely the floor served by the horizontal exit.

PART IV – IFC

Revise as follows:

[F] 403.2 Automatic sprinkler system. Buildings and structures shall be equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 and a secondary water supply where required by Section 903.3.5.2.

Exception: An automatic sprinkler system shall not be required in spaces or areas of:

1. Open parking garages in accordance with Section 406.3.
2. Telecommunications equipment buildings used exclusively for telecommunications equipment, associated electrical power distribution equipment, batteries and standby engines, provided that those spaces or areas are equipped throughout with an automatic fire detection system in accordance with Section 907.2 and are separated from the remainder of the building by not less than 1-hour fire barriers consisting of not less than 1-hour fire-resistance-rated walls and constructed in accordance with Section 706 or not less than 2-hour fire-resistance-rated floor/ceiling horizontal assemblies constructed in accordance with Section 711, or both.

[F] 404.3 Automatic sprinkler protection. An approved automatic sprinkler system shall be installed throughout the entire building.

Exceptions:

1. That area of a building adjacent to or above the atrium need not be sprinklered provided that portion of the building is separated from the atrium portion by not less than a 2-hour ~~fire-resistance-rated~~ fire barriers constructed in accordance with Section 706 or horizontal assembly assemblies constructed in accordance with Section 711, or both.
2. Where the ceiling of the atrium is more than 55 feet (16 764 mm) above the floor, sprinkler protection at the ceiling of the atrium is not required.

[F] 415.6.1.2 Grinding rooms. Every room or space occupied for grinding or other operations that produce combustible dusts shall be enclosed with fire barriers constructed in accordance with Section 706 or horizontal assemblies constructed in accordance with Section 711, or both. ~~that have not less than a 2-hour~~ The minimum fire-resistance rating shall be 2-hours where the area is not more than 3,000 square feet (279 m²), and ~~not less than a 4-hour fire-resistance rating~~ 4 hours where the area is greater than 3,000 square feet (279 m²).

[F] 415.6.2.2 Tank protection. Storage tanks shall be noncombustible and protected from physical damage. A Fire barriers ~~wall~~ or horizontal assemblies or both around the storage tank(s) shall be permitted as the method of protection from physical damage.

[F] 415.6.3.4.1 Fire separation. ~~Separation of the Attached structures shall be provided separated from the building by fire barriers constructed in accordance with Section 706 or horizontal assemblies constructed in accordance with Section 711, or both, having a The minimum fire-resistance rating of not less than shall be 1 hour and the fire barriers shall not have openings. Fire barriers between attached structures occupied only for the storage of LP-gas are permitted to have fire door assemblies that comply with Section 715.~~ Such fire barriers and horizontal assemblies shall be designed to withstand a static pressure of at least 100 pounds per square foot (psf) (4788 Pa), except where the building to which the structure is attached is occupied by operations or processes having a similar hazard.

Exception: Fire barriers between attached structures occupied only for the storage of LP-gas are permitted to have fire door assemblies complying with Section 715.

[F] 415.6.3.5.2 Common construction. ~~Walls and floor/ceiling assemblies common to the room and to the building within which the room is located shall be fire barriers with not less than a 1-hour fire-resistance rating and without openings. Common walls for rooms occupied only for storage of LP-gas are permitted to have opening protectives complying with Section 715. The walls and ceilings shall be designed to withstand a static pressure of at least 100 psf (4788 Pa).~~

Exception: Where the building, within which the room is located, is occupied by operations or processes having a similar hazard.

[F] 415.6.3.5.2 Fire separation. The rooms shall be separated from the building by fire barriers constructed in accordance with Section 706 or horizontal assemblies constructed in accordance with Section 711, or both. The minimum fire-resistance rating shall be 1 hour and the fire barriers shall not have openings. Such fire barriers and horizontal assemblies shall be designed to withstand a static pressure of at least 100 pounds per square foot (4788 Pa), except where the building, within which the room is located, is occupied by operations or processes having a similar hazard.

Exception: Fire barriers between common walls occupied only for the storage of LP-gas are permitted to have opening protectives complying with Section 715.

[F] 415.7.1 Gas rooms. When gas rooms are provided, such rooms shall be separated from other areas by not less than a 1-hour fire barriers constructed in accordance with Section 706 or horizontal assemblies constructed in accordance with Section 711, or both.

[F] 415.7.3 Separation - highly toxic solids and liquids. Highly toxic solids and liquids not stored in approved hazardous materials storage cabinets shall be isolated from other hazardous materials storage by a not less than 1-hour fire barriers constructed in accordance with Section 706 or horizontal assemblies constructed in accordance with Section 711, or both having a fire-resistance rating of not less than 1 hour.

[F] 415.8.2.2 Separation. Fabrication areas, whose sizes are limited by the quantity of hazardous materials allowed by Table 415.8.2.1.1, shall be separated from each other, from corridors, and from other parts of the building by not less than 1-hour fire barriers constructed in accordance with Section 706 or horizontal assemblies constructed in accordance with Section 711, or both.

Exceptions:

1. Doors within such fire barrier walls, including doors to corridors, shall be only self-closing fire door assemblies having a fire-protection rating of not less than 3/4 hour.
2. Windows between fabrication areas and corridors are permitted to be fixed glazing listed and labeled for a fire protection rating of at least 3/4 hour in accordance with Section 715.

[F] 415.8.5.2.1 HPM rooms and gas rooms. HPM rooms and gas rooms shall be separated from other areas by ~~not less than a 2-hour~~ fire barriers constructed in accordance with Section 706 or horizontal assemblies constructed in accordance with Section 711, or both. The minimum fire-resistance rating shall be 2-hours where the area is 300 square feet (27.9 m²) or more and ~~not less than a 1-hour fire barrier~~ 1 hour where the area is less than 300 square feet (27.9 m²).

[F] 415.8.5.2.2 Liquid storage rooms. Liquid storage rooms shall be constructed in accordance with the following requirements:

1. Rooms in excess of 500 square feet (46.5 m²) shall have at least one exterior door approved for fire department access.
2. Rooms shall be separated from other areas by fire barriers ~~having a~~ constructed in accordance with Section 706 or horizontal assemblies constructed in accordance with Section 711, or both. The fire-resistance rating of shall be not less than 1-hour for rooms up to 150 square feet (13.9 m²) in area and not less than 2 hours where the room is more than 150 square feet (13.9 m²) in area.
3. Shelving, racks and wainscoting in such areas shall be of noncombustible construction or wood of not less than 1 inch (25 mm) nominal thickness.
4. Rooms used for the storage of Class I flammable liquids shall not be located in a basement.

[F] 416.2 Spray rooms. Spray rooms shall be enclosed with not less than 1-hour fire barriers constructed in accordance with Section 706 or horizontal assemblies constructed in accordance with Section 711, or both ~~with not less than a 1-hour fire-resistance rating.~~ Floors shall be waterproofed and drained in an approved manner.

[F] 418.4 Tank storage. Storage areas for flammable and combustible liquid tanks inside of structures shall be located at or above grade and shall be separated from the processing area by not less than 2-hour fire barriers constructed in accordance with Section 706 or horizontal assemblies constructed in accordance with Section 711, or both.

[F] 418.5 Nitrocellulose storage. Nitrocellulose storage shall be located on a detached pad or in a separate structure or a room enclosed with no less than 2-hour fire barriers constructed in accordance with Section 706 or horizontal assemblies constructed in accordance with Section 711, or both.

[F] 418.6 Finished products. Storage rooms for finished products that are flammable or combustible liquids shall be separated from the processing area by not less than 2-hour fire barriers having a fire-resistance rating of at least 2 hours, and openings in the walls shall be protected with approved opening protectives constructed in accordance with Section 706 or horizontal assemblies constructed in accordance with Section 711, or both.

[F] 420.4 Design and construction. Hydrogen cutoff rooms shall be classified with respect to occupancy in accordance with Section 302.1 and separated from other areas of the building by not less than 1-hour fire barriers constructed in accordance with Section 706 or horizontal assemblies constructed in accordance with Section 711, or both; or as required by Section 508.2 or 508.3 as applicable.

[F] 420.4.1 Opening protectives. Doors within ~~such~~ the fire barriers walls, including doors to corridors, shall be self-closing in accordance with Section 715. Interior door openings shall be electronically interlocked to prevent operation of the hydrogen system when doors are opened or ajar or the room shall be provided with a mechanical exhaust ventilation system designed in accordance with Section 420.4.1.1.

[F] 903.2 Where required. Approved automatic sprinkler systems in new buildings and structures shall be provided in the locations described in this section.

Exception: Spaces or areas in telecommunications buildings used exclusively for telecommunications equipment, associated electrical power distribution equipment, batteries and standby engines, provided those spaces or areas are equipped throughout with an automatic fire alarm system and are separated from the remainder of the building by not less than 1 hour fire barriers consisting of not less than 1-hour fire-resistance-rated walls and constructed in accordance with Section 706 or not less than 2 hour fire-resistance-rated floor/ceiling horizontal assemblies constructed in accordance with Section 711, or both.

[F] 909.11 (IMC [F] 513.11, IFC 909.11) Power systems. The smoke control system shall be supplied with two sources of power. Primary power shall be the normal building power systems. Secondary power shall be from an approved standby source complying with the *International Code Council Electrical Code Administrative Provisions*. The standby power source and its transfer switches shall be in a ~~separate room~~ separate from the normal power transformers and switch gear and ventilated directly to and from the exterior, and The room shall be enclosed in a room constructed of with not less than 1-hour fire barriers ~~ventilated directly to and from the exterior~~ constructed in accordance with Section 706 or horizontal assemblies constructed in accordance with Section 711, or both. Power distribution from the two sources shall be by independent routes. Transfer to full standby power shall be automatic and within 60 seconds of failure of the primary power. The systems shall comply with this code or the *International Code Council Electrical Code Administrative Provisions*.

[F] 910.3.4 Vent locations. Smoke and heat vents shall be located 20 feet (6096 mm) or more from adjacent lot lines and fire walls and 10 feet (3048 mm) or more from fire barriers ~~walls~~. Vents shall be uniformly located within the roof area above high-piled storage areas, with consideration given to roof pitch, draft curtain location, sprinkler location and structural members.

[F] 910.4.4 Wiring and control. Wiring for operation and control of smoke exhaust fans shall be connected ahead of the main disconnect and protected against exposure to temperatures in excess of 1,000°F (538°C) for a period of not less than 15 minutes. Controls shall be located so as to be immediately accessible to the fire service from the exterior of the building and protected against interior fire exposure by not less than 1-hour fire barriers ~~having a fire-resistance rating not less than 1 hour~~ constructed in accordance with Section 706 or horizontal assemblies constructed in accordance with Section 711, or both.

Reason: Code change proposal FS2-04/05 (AMPC1) changed the concept of a fire barrier from being a fire containment assembly to begin a component of a fire containment assembly. This was accomplished by changing the definition of fire barrier from begin a vertical or horizontal assembly to being a wall assembly and by deleting the provisions for horizontal fire barriers. The proposal made the necessary revisions to several sections of the IBC for consistency with the change in concept (i.e., Sections 403.10.1, 404.5, 414.2.1, 508.2.2.1, 508.3.3.4.1, 706.3.5, 706.3.7, 706.3.9, 707.5, 911.1 and 1020.1). The proposal, however, did not make the necessary revisions to other sections of the IBC, which are needed in order for the concept to be fully incorporated into the provisions of the IBC. The purpose of this proposal is to make the necessary revisions to the provisions in those code sections.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

PART I C IBC FIRE SAFETY

Committee Action:

Approved as Submitted

Committee Reason: The proponent has correctly addressed an inconsistency in the code which has been caused by the changes made by FS2-04/05 in a previous code change cycle. Those changes made the distinction that fire barriers were walls and did not include horizontal assemblies. By going through these sections and making these changes, it provides consistency between the intent of FS2-04/05 and between the sections which were not addressed by that proposal. This action also is consistent with the action taken by the IFC committee earlier.

Assembly Action:

None

PART II C IBC GENERAL

Committee Action:

Approved as Submitted

Committee Reason: The revisions to add horizontal assemblies in addition to fire barriers is consistent with changes made to other portions of the code in the 2006 edition. This action is also consistent with the action on Part I of the proposal.

Assembly Action:

None

PART III C IBC MEANS OF EGRESS

Committee Action:

Approved as Submitted

Committee Reason: The revised language in Sections 1021.3 and 1022.2. would provide consistency in the code for the usage of the terms fire barriers and horizontal assemblies.

Assembly Action:

None

PART IV C IFC

Committee Action:

Approved as Submitted

Committee Reason: The proposal completes a needed correlation effort undertaken in the 2004/2005 cycle to provide consistent terminology and references when referring to fire barrier and horizontal assembly enclosures.

Assembly Action:

None

Final Hearing Results

FS37-06/07, Part I	AS
FS37-06/07, Part II	AS
FS37-06/07, Part III	AS
FS37-06/07, Part IV	AS

Code Change No: **FS40-06/07**

Original Proposal

Sections: 508.2.2.1, 706.5

Proponent: Philip Brazil, P.E., Reid Middleton, Inc., representing himself

THIS PROPOSAL IS ON THE AGENDA OF THE IBC GENERAL AND THE IBC FIRE SAFETY CODE DEVELOPMENT COMMITTEES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IBC FIRE SAFETY

Revise as follows:

706.5 Continuity. Fire barriers shall extend from the top of the floor/ceiling assembly below to the underside of the floor or roof sheathing, slab or deck above and shall be securely attached thereto. Such fire barriers shall be continuous through concealed spaces, such as the space above a suspended ceiling. The supporting construction for fire barriers shall be protected to afford the required fire-resistance rating of the fire barrier supported, except for 1-hour fire-resistance-rated incidental use area separations as required by Table 508.2 in buildings of Type IIB, IIIB and VB construction. Hollow vertical spaces within a fire barrier shall be fireblocked in accordance with Section 717.2 at every floor level.

Exceptions:

1. The maximum required fire-resistance rating for assemblies supporting fire barriers separating tank storage as provided for in Section 415.6.2.1 shall be 2 hours, but not less than required by Table 601 for the building construction type.
2. Shaft enclosures shall be permitted to terminate at a top enclosure complying with Section 707.12.

PART II – IBC GENERAL

Revise as follows:

508.2.2.1 Construction. Where Table 508.2 requires a fire-resistance-rated separation, the incidental use area shall be separated from the remainder of the building by a fire barrier constructed in accordance with Section 706 or a horizontal assembly constructed in accordance with Section 711, or both. Where Table 508.2 permits an automatic fire-extinguishing system without a fire barrier, the incidental use area shall be separated from the remainder of the building by construction capable of resisting the passage of smoke. The partitions shall extend from top of the foundation or the floor/ceiling assembly below to the underside of the fire-resistance-rated floor/ceiling assembly above or fire-resistance-rated roof/ceiling assembly above or to the underside of the floor or roof sheathing, ~~or sub deck or slab~~ above. Doors shall be self- or automatic closing upon detection of smoke in accordance with Section 715.3.7.3. Doors shall not have air transfer openings and shall not be undercut in excess of the clearance permitted in accordance with NFPA 80.

Reason: The purpose of this proposal is to restore the revisions approved by code change proposals FS19-03/04(AM) and FS26-04/05(AS) and for consistency with Sections 705.6 (Exceptions 2 and 3), 705.6.1 (Exception), 707.12, 708.4, 709.4 and 710.4. They were inadvertently eliminated by code change proposals G14-04/05(AMPC1) and FS2-04/05(AMPC1).

Cost Impact: The code change proposal will not increase the cost of construction

Analysis: Copies of and information about code changes from previous code change cycles can be obtained at <http://www.iccsafe.org/cs/codes>.

Public Hearing Results

**PART I C IBC FIRE SAFETY
Committee Action:**

Approved as Submitted

Committee Reason: This helps clear up confusion as stated by the proponent and resolves some concerns with the actions taken by several previous code changes. This provides better clarity as to where a fire barrier is expected to extend.

Assembly Action: **None**

PART II C IBC GENERAL

Committee Action: **Approved as Submitted**

Committee Reason: The proposal restores issues that had been previously approved but had been lost due to extensive changes to this particular section in the previous code change cycle.

Assembly Action: **None**

Final Hearing Results

FS40-06/07, Part I	AS
FS40-06/07, Part II	AS

Code Change No: FS42-06/07

Original Proposal

Section: 706.7

Proponent: Sarah A. Rice, C.B.O., Schirmer Engineering Corp.

Revise as follows:

706.7 Openings. Openings in a fire barrier wall shall be protected in accordance with Section 715. Openings shall be limited to a maximum aggregate width of 25 percent of the length of the wall, and the maximum area of any single opening shall not exceed 156 square feet (15m²). Openings in exit enclosures and exit passageways shall also comply with Sections 1020.1.1 and 1021.4, respectively.

Exceptions:

1. Openings shall not be limited to 156 square feet (15 m²) where adjoining fire areas are equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.
2. Openings shall not be limited to 156 square feet (15 m²) or an aggregate width of 25 percent of the length of the wall where the opening protective is a fire doors serving an exit enclosure.
3. Openings shall not be limited to 156 square feet (15 m²) or an aggregate width of 25 percent of the length of the wall where the opening protective assembly has been tested in accordance with ASTM E 119 and has a minimum fire-resistance rating not less than the fire-resistance rating of the wall.
4. Fire windows permitted in atrium separation walls shall not be limited to a maximum aggregate width of 25 percent of length of the wall.

Reason: Without the proposed language the code literally exempts fire doors in exit enclosures from all the requirements of Section 706.7, which would include the requirement in the first that requires "Openings in a fire barrier wall shall be protected in accordance with Section 715." and the last sentence which requires "Openings in exit enclosures and exit passageways shall also comply with Sections 1020.1.1 and 1021.4, respectively."

The proposed language makes it clear that Exception 2 is intended only to allow the omission of the size limitations.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action: **Approved as Submitted**

Committee Reason: This proposal provides continuity with other sections on the amount of openings and coordinates with the action taken on FS33-06/07 earlier. In addition, this will address a very common situation that would not be permitted based on the literal interpretation of the current code text.

Assembly Action:

None

Final Hearing Results

FS42-06/07

AS

Code Change No: FS43-06/07

Original Proposal

Sections: 706.7, 712.3.1.1 (IMC 607.5.4), 2603.8

Proponent: Philip Brazil, P.E., Reid Middleton, Inc., representing himself

Revise as follows:

706.7 Openings. Openings in a fire barrier wall shall be protected in accordance with Section 715. Openings shall be limited to a maximum aggregate width of 25 percent of the length of the wall, and the maximum area of any single opening shall not exceed 156 square feet (15m²). Openings in exit enclosures and exit passageways shall also comply with Sections 1020.1.1 and 1021.4, respectively.

Exceptions:

1. Openings shall not be limited to 156 square feet (15 m²) where adjoining fire areas are equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.
2. Fire doors serving an exit enclosure.
3. Openings shall not be limited to 156 square feet (15 m²) or an aggregate width of 25 percent of the length of the wall where the opening protective assembly has been tested in accordance with ASTM E 119 and has a minimum fire-resistance rating not less than the fire-resistance rating of the wall.
4. Fire windows assemblies permitted in atrium separation walls shall not be limited to a maximum aggregate width of 25 percent of length of the wall.

716.5.4 (IMC 607.5.4) Fire partitions. Ducts and air transfer openings that penetrate fire partitions shall be protected with listed fire dampers installed in accordance with their listing.

Exceptions: In occupancies other than Group H, fire dampers are not required where any of the following apply:

1. The partitions are tenant separation or corridor walls in buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2 and the duct is protected as a through penetration in accordance with Section 712.
2. Tenant partitions in covered mall buildings where the walls are not required by provisions elsewhere in the code to extend to the underside of the floor or roof sheathing, slab or deck above.
3. The duct system is constructed of approved materials in accordance with the *International Mechanical Code* and the duct penetrating the wall complies with all of the following requirements:
 - 3.1. The duct shall not exceed 100 square inches (0.06 m²).
 - 3.2. The duct shall be constructed of steel a minimum of 0.0217 inch (0.55 mm) in thickness.
 - 3.3. The duct shall not have openings that communicate the corridor with adjacent spaces or rooms.
 - 3.4. The duct shall be installed above a ceiling.
 - 3.5. The duct shall not terminate at a wall register in the fire-resistance-rated wall.
 - 3.6. A minimum 12-inch-long (305 mm) by 0.060-inch-thick (1.52 mm) steel sleeve shall be centered in each duct opening. The sleeve shall be secured to both sides of the wall and all four sides of the

sleeve with minimum 1 1/2-inch by 1 1/2-inch by 0.060-inch (38 mm by 38 mm by 1.52 mm) steel retaining angles. The retaining angles shall be secured to the sleeve and the wall with No. 10 (M5) screws. The annular space between the steel sleeve and the wall opening shall be filled with mineral wool batting on all sides.

2603.8 Protection against termites. In areas where the probability of termite infestation is very heavy in accordance with Figure 2603.8, extruded and expanded polystyrene, polyisocyanurate and other foam plastics shall not be installed on the exterior face or under interior or exterior foundation walls or slab foundations located below grade. The clearance between foam plastics installed above grade and exposed earth shall be at least 6 inches (152 mm).

Exceptions:

1. Buildings where the structural members of walls, floors, ceilings and roofs are entirely of noncombustible materials or ~~preservatively~~ preservative-treated wood.
2. An approved method of protecting the foam plastic and structure from subterranean termite damage is provided.
3. On the interior side of basement walls.

Reason:

1. 706.7: Consistency with Section 715.4.
2. 716.5.4: Consistency with code change proposal FS19-03/04 (AM).
3. 2603.8: Consistency with current definition in Section 2302.1.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The proposal provides more specific language which will make the sections consistent with other sections of the code. In addition, Section 716.5.4 will help clarify exactly where the wall is required to extend to.

Assembly Action:

None

Final Hearing Results

FS43-06/07

AS

Code Change No: FS46-06/07

Original Proposal

Sections: 707.2, 712.1.1 712.3.3, 716.1.1 (IMC 607.1.1) and 716.1.1.1 (New), (IMC 607.1.1.1) (New)

Proponent: Vickie Lovell, Delray, FL, representing Air Movement and Control Association

707.2 Shaft enclosure required. Openings through a floor/ceiling assembly shall be protected by a shaft enclosure complying with this Section.

Exceptions:

1. A shaft enclosure is not required for openings totally within an individual residential dwelling unit and connecting four stories or less.

2. A shaft enclosure is not required in a building equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 for an escalator opening or stairway that is not a portion of the means of egress protected according to Item 2.1 or 2.2:
 - 2.1. Where the area of the floor opening between stories does not exceed twice the horizontal projected area of the escalator or stairway and the opening is protected by a draft curtain and closely spaced sprinklers in accordance with NFPA 13. In other than Groups B and M, this application is limited to openings that do not connect more than four stories.
 - 2.2. Where the opening is protected by approved power-operated automatic shutters at every penetrated floor. The shutters shall be of noncombustible construction and have a fire-resistance rating of not less than 1.5 hours. The shutter shall be so constructed as to close immediately upon the actuation of a smoke detector installed in accordance with Section 907.11 and shall completely shut off the well opening. Escalators shall cease operation when the shutter begins to close. The shutter shall operate at a speed of not more than 30 feet per minute (152.4 mm/s) and shall be equipped with a sensitive leading edge to arrest its progress where in contact with any obstacle, and to continue its progress on release there from.
3. A shaft enclosure is not required for penetrations by pipe, tube, conduit, wire, cable and vents protected in accordance with Section 712.4.
4. A shaft enclosure is not required for penetrations by air ducts protected in accordance with Section ~~712.4~~ 716.5. Grease ducts and other hazardous exhaust ducts shall be protected in accordance with the *International Mechanical Code*.
5. In other than Group H occupancies, a shaft enclosure is not required for floor openings complying with the provisions for atriums in Section 404.
6. A shaft enclosure is not required for approved masonry chimneys where annular space protection is provided at each floor level in accordance with Section 717.2.5.
7. In other than Groups I-2 and I-3, a shaft enclosure is not required for a floor opening or an air transfer opening that complies with the following:
 - 7.1. Does not connect more than two stories.
 - 7.2. Is not part of the required means of egress system, except as permitted in Section 1020.1.
 - 7.3. Is not concealed within the building construction.
 - 7.4. Is not open to a corridor in Group I and R occupancies.
 - 7.5. Is not open to a corridor on nonsprinklered floors in any occupancy.
 - 7.6. Is separated from floor openings and air transfer openings serving other floors by construction conforming to required shaft enclosures.
 - 7.7. Is limited to the same smoke compartment.
8. A shaft enclosure is not required for automobile ramps in open and enclosed parking garages constructed in accordance with Sections 406.3 and 406.4, respectively.
9. A shaft enclosure is not required for floor openings between a mezzanine and the floor below.
10. A shaft enclosure is not required for joints protected by a fire-resistant joint system in accordance with Section 713.
11. A shaft enclosure shall not be required for floor openings created by unenclosed stairs or ramps in accordance with Exception 8 or 9 in Section 1020.1.
12. Floor openings protected by floor fire doors in accordance with Section 711.8.
13. Where permitted by other sections of this code.

~~712.3.3~~ 712.1.1 Ducts and air transfer openings. Penetrations of fire-resistance-rated walls by ducts that are not protected with dampers shall comply with Sections 712.2 through 712.3.4. Penetrations of horizontal assemblies not protected with a shaft as permitted by Exception #4 of Section 707, and are not required to be protected with fire dampers by other sections of the code, shall comply with Sections 712.4 through 712.4.4. Ducts and air transfer openings that are protected with dampers shall comply with Section 716.

716.1.1 (IMC 607.1.1) Ducts that penetrate fire resistance rated assemblies without dampers. Ducts that penetrate fire-resistance-rated assemblies and are not required by this section to have dampers shall comply with the requirements of Sections 712.2 through 712.3.4. Ducts that penetrate horizontal assemblies not required to be contained within a shaft and are not required by this section to have dampers shall comply with the requirements of Sections 712.4 through 712.4.4

716.1.1.1 (IMC 607.1.1.1) Ducts that penetrate non-fire resistance rated assemblies The space around a duct penetrating a non-fire resistance rated wall assembly shall be filled with an approved material to limit the free passage of smoke. The space around a duct penetrating a non-fire resistance rated floor assembly shall comply with 716.6.3.

Reason: The incorrect correlation between sections 707, 712 and 716 has lead to misinterpretation of the requirements for fire dampers by code users.

Fire dampers and through penetration firestops are not equivalent alternatives for one another. However, either could be considered an alternative to a shaft enclosure, under specific, appropriate conditions. The 2006 Edition of the IBC outlines the minimum requirements as to when fire dampers are required, and specific conditions as to when dampers can be omitted due to other provisions in the code. But the code also states that when ducts are not enclosed in a shaft, and are permitted to penetrate a fire resistance rated assembly without fire dampers, the assembly still must be protected with through penetration protection. Unfortunately, due to the way the code is currently formatted, that is not clearly laid out.

The current hierarchy of code sections in the 2006 IBC that applies to ducts is as follows:

1. Section 707 - Shafts are acceptable, traditional protection for duct penetrations through floor assemblies.
2. Exception 4 of Section 707 permits alternate protection of ducts and directs the user to 712.4 for the protection of penetrations
3. Section 712.4 .1.3 directs the user to Section 716 specifically for protection of ducts and air transfer openings.

The correct and more user friendly hierarchy of code sections that applies to ducts in floor assemblies should be as follows:

Section 707 - Shafts are acceptable, traditional protection for duct penetrations through floor assemblies.

Exception 4 of Section 707 permits alternate protection of ducts other than shafts and should send the user directly to Section 716, "Ducts and Air Transfer Openings", where the protection requirements specifically for ducts are located, or to the Mechanical Code for protection for exhaust ducts.

Where Section 716 (or some other section of the code) does not require a fire damper in the duct, then the section should send the user to 712.4 for protection requirements of the duct.

We believe that these code change proposals help the code user to more quickly find the correct method of protection for ducts.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Modified

Modify the proposal as follows:

707.2 Shaft enclosure required. Openings through a floor/ceiling assembly shall be protected by a shaft enclosure complying with this Section.

Exceptions:

1. A shaft enclosure is not required for openings totally within an individual residential dwelling unit and connecting four stories or less.
2. A shaft enclosure is not required in a building equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 for an escalator opening or stairway that is not a portion of the means of egress protected according to Item 2.1 or 2.2:
 - 2.1. Where the area of the floor opening between stories does not exceed twice the horizontal projected area of the escalator or stairway and the opening is protected by a draft curtain and closely spaced sprinklers in accordance with NFPA 13. In other than Groups B and M, this application is limited to openings that do not connect more than four stories.
 - 2.2. Where the opening is protected by approved power-operated automatic shutters at every penetrated floor. The shutters shall be of noncombustible construction and have a fire-resistance rating of not less than 1.5 hours. The shutter shall be so constructed as to close immediately upon the actuation of a smoke detector installed in accordance with Section 907.11 and shall completely shut off the well opening. Escalators shall cease operation when the shutter begins to close. The shutter shall operate at a speed of not more than 30 feet per minute (152.4 mm/s) and shall be equipped with a sensitive leading edge to arrest its progress where in contact with any obstacle, and to continue its progress on release there from.
3. A shaft enclosure is not required for penetrations by pipe, tube, conduit, wire, cable and vents protected in accordance with Section 712.4.
4. A shaft enclosure is not required for penetrations by ducts protected in accordance with Section 712.4. Grease ducts shall be protected in accordance with the *International Mechanical Code*.
5. In other than Group H occupancies, a shaft enclosure is not required for floor openings complying with the provisions for atriums in Section 404.
6. A shaft enclosure is not required for approved masonry chimneys where annular space protection is provided at each floor level in accordance with Section 717.2.5.
7. In other than Groups I-2 and I-3, a shaft enclosure is not required for a floor opening or an air transfer opening that complies with the following:
 - 7.1. Does not connect more than two stories.
 - 7.2. Is not part of the required means of egress system, except as permitted in Section 1020.1.
 - 7.3. Is not concealed within the building construction.
 - 7.4. Is not open to a corridor in Group I and R occupancies.
 - 7.5. Is not open to a corridor on nonsprinklered floors in any occupancy.
 - 7.6. Is separated from floor openings and air transfer openings serving other floors by construction conforming to required shaft enclosures.
 - 7.7. Is limited to the same smoke compartment.
8. A shaft enclosure is not required for automobile ramps in open and enclosed parking garages constructed in accordance with Sections 406.3 and 406.4, respectively.
9. A shaft enclosure is not required for floor openings between a mezzanine and the floor below.
10. A shaft enclosure is not required for joints protected by a fire-resistant joint system in accordance with Section 713.
11. A shaft enclosure shall not be required for floor openings created by unenclosed stairs or ramps in accordance with Exception 8 or 9 in Section 1020.1.
12. Floor openings protected by floor fire doors in accordance with Section 711.8.
13. Where permitted by other sections of this code.

(Existing 712.3.3) 712.1.1 Ducts and air transfer openings. Penetrations of fire-resistance-rated walls by ducts that are not protected with dampers shall comply with Sections 712.2 through 712.3.4. Penetrations of horizontal assemblies not protected with a shaft as permitted by Exception #4 of Section 707, and are not required to be protected with fire dampers by other sections of the code, shall comply with Sections 712.4 through 712.4.4. Ducts and air transfer openings that are protected with dampers shall comply with Section 716.

716.1.1 (IMC 607.1.1) Ducts that penetrate fire resistance rated assemblies without dampers. Ducts that penetrate fire-resistance-rated assemblies and are not required by this section to have dampers shall comply with the requirements of Sections 712.2 through 712.3.4. Ducts that penetrate horizontal assemblies not required to be contained within a shaft and are not required by this section to have dampers shall comply with the requirements of Sections 712.4 through 712.4.4

716.1.1.1 (IMC 607.1.1.1) Ducts that penetrate non-fire resistance rated assemblies. ~~The space around a duct penetrating a non-fire resistance rated wall assembly shall be filled with an approved material to limit the free passage of smoke.~~ The space around a duct penetrating a non-fire resistance rated floor assembly shall comply with 716.6.3.

Committee Reason: This proposal helps to provide references and direction to the applicable code section. These revisions should help clarify the application of the various sections. The modifications eliminate the changes in Section 707.2 item 4 which was acted on in FS45-06/07. The revision in 716.1.1.1 eliminates the requirement being applied to walls and leaves it so it simply references existing requirements for floors in 716.6.3. The revisions in Sections 712.1.1 and 716.1.1 are strictly editorial.

Assembly Action:

None

Final Hearing Results

FS46-06/07

AM

Code Change No: FS48-06/07

Original Proposal

Section: 707.2

Proponent: Tom Rubottom, City of Lakewood, representing The Colorado Chapter of ICC

Revise as follows:

707.2 Shaft enclosure required. Openings through a floor/ceiling assembly shall be protected by a shaft enclosure complying with this Section.

Exceptions:

1. A shaft enclosure is not required for openings totally within an individual residential dwelling unit and connecting four stories or less.
2. A shaft enclosure is not required in a building equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 for an escalator opening or stairway that is not a portion of the means of egress protected according to Item 2.1 or 2.2:
 - 2.1. Where the area of the floor opening between stories does not exceed twice the horizontal projected area of the escalator or stairway and the opening is protected by a draft curtain and closely spaced sprinklers in accordance with NFPA 13. In other than Groups B and M, this application is limited to openings that do not connect more than four stories.
 - 2.2. Where the opening is protected by approved power-operated automatic shutters at every penetrated floor. The shutters shall be of noncombustible construction and have a fire-resistance rating of not less than 1.5 hours. The shutter shall be so constructed as to close immediately upon the actuation of a smoke detector installed in accordance with Section 907.11 and shall completely shut off the well opening. Escalators shall cease operation when the shutter begins to close. The shutter shall operate at a speed of not more than 30 feet per minute (152.4 mm/s) and shall be equipped with a sensitive leading edge to arrest its progress where in contact with any obstacle, and to continue its progress on release therefrom.
3. A shaft enclosure is not required for penetrations by pipe, tube, conduit, wire, cable and vents protected in accordance with Section 712.4.

4. A shaft enclosure is not required for penetrations by ducts protected in accordance with Section 712.4. Grease ducts shall be protected in accordance with the *International Mechanical Code*.
5. In other than Group H occupancies, a shaft enclosure is not required for floor openings complying with the provisions for atriums in Section 404.
6. A shaft enclosure is not required for approved masonry chimneys where annular space protection is provided at each floor level in accordance with Section 717.2.5.
7. In other than Groups I-2 and I-3, a shaft enclosure is not required for a floor opening or an air transfer opening that complies with the following:
 - 7.1. Does not connect more than two stories.
 - 7.2. Is not part of the required means of egress system, except as permitted in Section 1020.1.
 - 7.3. Is not concealed within the building construction.
 - 7.4. Is not open to a corridor in Group I and R occupancies.
 - 7.5. Is not open to a corridor on nonsprinklered floors in any occupancy.
 - 7.6. Is separated from floor openings and air transfer openings serving other floors by construction conforming to required shaft enclosures.
 - 7.7. Is limited to the same smoke compartment.
8. A shaft enclosure is not required for automobile ramps in open and enclosed parking garages constructed in accordance with Sections 406.3 and 406.4, respectively.
9. A shaft enclosure is not required for floor openings between a mezzanine and the floor below.
10. A shaft enclosure is not required for joints protected by a fire-resistant joint system in accordance with Section 713.
11. A shaft enclosure shall not be required for floor openings created by unenclosed stairs or ramps in accordance with Exception 8 or 9 in Section 1020.1.
12. Floor openings protected by floor fire doors in accordance with Section 711.8.
13. Where permitted by other sections of this code.
14. A shaft enclosure is not required for floor openings for elevators within a single use open parking garage.

Reason: Adding this language will clarify that a fire rated shaft enclosure would not be required for an elevator when located within a single use open parking garage. Section 707.2 exception 8 allows the ramps within open parking garages to not meet the shaft requirements. Section 1020.1 exception 5 allows stairways serving only the parking structure to be unenclosed and not meet the shaft requirements. This new language will clarify that the elevator floor penetration would also not require shaft protection.

Cost Impact: The code change proposal will not increase the cost of construction. This would result in a cost reduction.

Public Hearing Results

Committee Action:

Approved as Modified

Modify the proposal as follows:

707.2 Shaft enclosure required. Openings through a floor/ceiling assembly shall be protected by a shaft enclosure complying with this Section.

Exceptions:

1. A shaft enclosure is not required for openings totally within an individual residential dwelling unit and connecting four stories or less.
2. A shaft enclosure is not required in a building equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 for an escalator opening or stairway that is not a portion of the means of egress protected according to Item 2.1 or 2.2:
 - 2.1. Where the area of the floor opening between stories does not exceed twice the horizontal projected area of the escalator or stairway and the opening is protected by a draft curtain and closely spaced sprinklers in accordance with NFPA 13. In other than Groups B and M, this application is limited to openings that do not connect more than four stories.
 - 2.2. Where the opening is protected by approved power-operated automatic shutters at every penetrated floor. The shutters shall be of noncombustible construction and have a fire-resistance rating of not less than 1.5 hours. The shutter shall be so constructed as to close immediately upon the actuation of a smoke detector installed in accordance with Section 907.11 and shall completely shut off the well opening. Escalators shall cease operation when the shutter begins to close. The shutter shall operate at a speed of not more than 30 feet per minute (152.4 mm/s) and shall be equipped with a sensitive leading edge to arrest its progress where in contact with any obstacle, and to continue its progress on release therefrom.
3. A shaft enclosure is not required for penetrations by pipe, tube, conduit, wire, cable and vents protected in accordance with Section 712.4.
4. A shaft enclosure is not required for penetrations by ducts protected in accordance with Section 712.4. Grease ducts shall be protected in accordance with the *International Mechanical Code*.
5. In other than Group H occupancies, a shaft enclosure is not required for floor openings complying with the provisions for atriums in Section 404.
6. A shaft enclosure is not required for approved masonry chimneys where annular space protection is provided at each floor level in accordance with Section 717.2.5.
7. In other than Groups I-2 and I-3, a shaft enclosure is not required for a floor opening or an air transfer opening that complies with the following:
 - 7.1. Does not connect more than two stories.
 - 7.2. Is not part of the required means of egress system, except as permitted in Section 1020.1.

- 7.3. Is not concealed within the building construction.
- 7.4. Is not open to a corridor in Group I and R occupancies.
- 7.5. Is not open to a corridor on nonsprinklered floors in any occupancy.
- 7.6. Is separated from floor openings and air transfer openings serving other floors by construction conforming to required shaft enclosures.
- 7.7. Is limited to the same smoke compartment.
8. A shaft enclosure is not required for automobile ramps in open and enclosed parking garages constructed in accordance with Sections 406.3 and 406.4, respectively.
9. A shaft enclosure is not required for floor openings between a mezzanine and the floor below.
10. A shaft enclosure is not required for joints protected by a fire-resistant joint system in accordance with Section 713.
11. A shaft enclosure shall not be required for floor openings created by unenclosed stairs or ramps in accordance with Exception 8 or 9 in Section 1020.1.
12. Floor openings protected by floor fire doors in accordance with Section 711.8.
13. Where permitted by other sections of this code.
14. ~~A shaft enclosure is not required for floor openings for elevators within a single use open parking garage. Elevators in open parking garages that serve only the parking garage are not required to be enclosed.~~

Committee Reason: This proposal helps make the code more consistent by allowing the elevator to not be within a shaft enclosure. The code currently permits the elimination of the enclosure for stairs and ramps, but not for elevators. As originally proposed the requirement limited the application to single use[®] open parking garages. This was accepted because the hazards are low and have not been a problem for the other unprotected floor openings. The modification did eliminate the limitation to single use garages but still only applies the exception to an open garage portion of the building where the floor opening is not affected by other occupancies or connecting to openings at other floors. This modification uses language that is consistent with Section 1020.1 Exception 5.

Assembly Action:

None

Final Hearing Results

FS48-06/07

AM

Code Change No: FS52-06/07

Original Proposal

Section: 707.14.1

Proponent: Bill Ziegert, Smoke Guard, division of RectorSeal

707.14.1 Elevator lobby. An enclosed elevator lobby shall be provided at each floor where an elevator shaft enclosure connects more than three stories. The lobby shall separate the elevator shaft enclosure doors from each floor by fire partitions equal to the fire-resistance rating of the corridor and the required opening protection. Elevator lobbies shall have at least one means of egress complying with Chapter 10 and other provisions within this code.

Exceptions:

1. Enclosed elevator lobbies are not required at the street floor, provided the entire street floor is equipped with an automatic sprinkler system in accordance with Section 903.3.1.1.
2. Elevators not required to be located in a shaft in accordance with Section 707.2 are not required to have enclosed elevator lobbies.
3. Where additional doors are provided at the hoistway opening in accordance with Section 3002.6. Such doors shall be tested in accordance with UL 1784 without an artificial bottom seal.
4. In other than Group I-2 and I-3, and buildings having occupied floors located more than 75 feet (22 860 mm) above the lowest level of fire department vehicle access, enclosed elevator lobbies are not required where the building is protected by an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2.
5. Smoke partitions shall be permitted in lieu of fire partitions to separate the elevator lobby at each floor where the building is equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2.
6. Enclosed elevator lobbies are not required where the elevator hoistway is pressurized in accordance with Section 707.14.2.

Reason: The purpose of the elevator lobby is to prevent smoke migration between floors. This change would clarify that elevator shaft smoke protection is required in I-2 occupancies.

Patients in hospitals and nursing homes are the least likely of building occupants to be able to provide self directed evacuation in a fire emergency. Currently the code requires the establishment of at least 2 smoke compartments on each floor which allows patients to be relocated to another area of the floor on the other side of the smoke barrier construction, however the elevator shaft penetrates the floor assemblies and the elevator hoistway doors allow excessive amounts of smoke to leak into the elevator shaft and then to other floors when the hoistway opening is not protected.

Many states and local jurisdictions already enforce a requirement such as this based upon either protection of entrances into corridors from smoke migration or alternately the requirement that the smoke compartments must seal all openings (vertical and horizontal) against the movement of smoke. Adding the proposed language to Exception 4 would insure uniform enforcement.

Cost Impact: The code change proposal will increase the cost of construction. There may be a cost increase in those jurisdictions not requiring this level of protection in I-2 occupancies now, however there is no cost increase for those jurisdictions already enforcing this requirement based upon other language in the IBC.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: This proposal helps provide better smoke control within this occupancy which tends to use a “defend in place” method of protection instead of evacuation. The I-2 non-ambulatory occupants need the same level of protection as I-3. Since the I-2 and I-3 have similar smoke compartment rules, the committee felt that the requirements should be consistent here also and help stop the spread of smoke between stories. Because elevator doors have a large air-leakage rate, the elevator openings should be protected by a lobby.

Assembly Action:

None

Final Hearing Results

FS52-06/07

AS

Code Change No: FS55-06/07

Original Proposal

Section: 707.14.2.1

Proponent: Bill Ziegert, Smoke Guard, division of RectorSeal

Revise as follows:

707.14.2.1 Pressurization requirements. Elevator hoistways shall be pressurized to maintain a minimum positive pressure of 0.04 inches of water column and a maximum positive pressure of 0.06 inches of water column with respect to adjacent occupied space on all floors. This pressure shall be measured at the midpoint of each hoistway door, with all ground floor level hoistway doors open and all other hoistway doors closed, and the opening and closing of hoistway doors at each level must be demonstrated during this test. The supply air intake shall be from an outside, uncontaminated source located a minimum distance of 20 feet (6096 mm) from any air exhaust system or outlet.

Reason: The purpose of this change is to ensure the proper operatin of the hoistway doors when the shaft pressurization system is activated and the Firefighters are using the elevators in Phase 2 service.

Elevator shaft pressurization systems are difficult to design due to the variable leakage rates through hoistway doors. As a result of this the system design at times results in excessive pressures at some floors in order to achieve the minimum pressure differentials at all floors. The result of this over pressurization can be binding of the hoistway’s doors during opening and closing operation resulting in sticking in a partially open position which places the emergency responders in the Elevator at risk.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: This proposal will assure that the elevator will operate when the fire department uses them during an emergency and help to assure the door closes if the door is accidentally opened at the fire floor. This is a relatively simple and cost effective item which will demonstrate performance of the doors during phase two elevator recall. The doors do need to be tested at each level because each door can have the force adjusted differently.

Assembly Action:

None

Final Hearing Results

FS55-06/07

AS

Code Change No: FS56-06/07

Original Proposal

Section: 707.14.2.1

Proponent: Janet Reed, City of Phoenix, AZ – Development Services Department

Revise as follows:

707.14.2.1 Pressurization requirements. Elevator hoistways shall be pressurized to maintain a minimum positive pressure of ~~0.04~~ 0.05 inches of water column and a maximum positive pressure of ~~0.06 inches of water column~~ as allowed by the elevator door manufacturer's specifications with respect to adjacent occupied space on all floors. This pressure shall be measured at the midpoint of each hoistway door, with all ~~ground floor level~~ elevator cars at the floor of recall and all hoistway doors on the floor of recall open and all other hoistway doors closed. The supply air intake shall be from an outside, uncontaminated source located a minimum distance of 20 feet (6096 mm) from any air exhaust system or outlet.

Reason: As written, this code would be extremely difficult to implement if not impossible.

The narrow pressure range prescribed, 0.04 to 0.06 inches H₂O, is approximately the range of stack effect that could be experienced per floor when inside temperature is 70 degrees Fahrenheit greater than outside. Under this condition it would require a system capable of providing a pressurized air supply injection and relief venting capability at each floor in the elevator shaft to maintain the 0.02 inches H₂O range of pressure called for. Furthermore, the minimum of 0.04 inches water column is less than the smoke barrier minimum of 0.05 inches water column called for elsewhere in this code and numerous other codes. The current code requires ground floor doors to be open under the apparent assumption that the ground floor is always the floor of recall. This is not always true, in fact in some express arrangements some elevators don't even go to the ground floor. It is therefore prescribed that the cars be at the floor of recall with those doors open.

A lower limit of 0.05 inches of water column would satisfy the minimum required for smoke barriers in Section 909.6.1. The upper limit would give enough range to allow a reasonable number of injection points and relief dampers to maintain the prescribed pressures. The maximum based on manufacturer's specifications would ensure that the system could be designed with the greatest flexibility while avoiding conditions that impair elevator operations. The rational analysis would then need to include the manufacturer's specifications.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Modified

Modify the proposal as follows:

707.14.2.1 Pressurization requirements. Elevator hoistways shall be pressurized to maintain a minimum positive pressure of 0.04 ~~0.05~~ inches of water column and a maximum positive pressure of 0.06 inches of water column ~~as allowed by the elevator door manufacturer's specifications~~ with respect to adjacent occupied space on all floors. This pressure shall be measured at the midpoint of each hoistway door, with all elevator cars at the floor of recall and all hoistway doors on the floor of recall open and all other hoistway doors closed. The supply air intake shall be from an outside, uncontaminated source located a minimum distance of 20 feet (6096 mm) from any air exhaust system or outlet.

Committee Reason: This modified proposal provides clarity on the testing conditions and where the elevator car is supposed to be during the test. This will help to provide consistency in the way the systems are tested and reflect the general condition that the elevators will be in during their emergency recall. There was also concern that tying the forces to the maximum the manufacturers specify could result in the door design going directly up to the maximum amount without any margin for error. The proposal will also clarify that the level of recall is used instead of the Aground floor level[®] since the ground floor is not always the appropriate location for the elevator to return to. The modification keeps the first sentence as it currently is in the code while the changes which were proposed to the second sentence are made as submitted.

Assembly Action:

None

Final Hearing Results

FS156-06/07

AS

Code Change No: **FS59-06/07**

Original Proposal

Sections: 707.14.2.2.1 (New), 3004.2

Proponent: Gregory J. Cahanin, Cahanin Fire & Code Consulting, representing Smoke Safety Council

THIS PROPOSAL IS ON THE AGENDA OF THE IBC FIRE SAFETY AND THE IBC GENERAL CODE DEVELOPMENT COMMITTEES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IBC FIRE SAFETY

Add new text as follows:

707.14.2.2 Ducts for system. Any duct system that is part of the pressurization system shall be protected with the same fire-resistance rating as required for the elevator shaft enclosure.

707.14.2.2.1 Ducts. Ducts shall open either directly to the outer air or through noncombustible ducts to the outer air. Noncombustible ducts shall be permitted to pass through the elevator machine room provided that portions of the ducts located outside the hoistway or machine room are enclosed by construction having not less than the fire resistance rating required for the hoistway.

PART II – IBC GENERAL

Revise as follows:

3004.2 Location of vents. Vents shall be located at the top the hoistway and shall open either directly to the outer air through noncombustible ducts to the outer air. Noncombustible ducts shall be permitted to pass through the elevator machine room, provided that portions of the ducts located outside the hoistway or machine room are enclosed by construction having not less than the fire ~~protection~~ resistance rating required for the hoistway. Holes in the machine room floors for the passage of ropes, cables or other moving elevator equipment shall be limited as not to provide greater than 2 inches (51 mm) of clearance on all sides.

Reason: This new section provides fire-resistance requirements equal to those now mandated for hoistway vents.

Section 3004.2 for location of Hoistway Vents contains specific requirements for ducting of vents. The new 707.14.2.2 section does not contain requirements equal to the compartmentation requirements established for the Hoistway itself when the hoistway penetrates more than three floors. New language is taken directly from 3004.2 and changed as appropriate for shaft pressurization ducts connecting to the hoistway shaft.

This change brings continuity to the isolation of shaft pressurization systems for elevator shafts that are established elsewhere in the IBC and clarifies the intent of the original proposal.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing Results

PART I C IBC FIRE SAFETY

Committee Action:

Disapproved

Committee Reason: This proposal is attempting to apply the requirements for hoistway venting from Chapter 30, which deals with smoke and heat within the hoistway for a very different situation. The ducts under this proposed new section are for pressurization and would not be anticipated to handle the heat and increased temperatures that the hoistway vent system of Chapter 30 is addressing. These ducts serve simply to pressurize the hoistway so that the smoke and heat do not get into it. Therefore, it would not be important for these ducts to be protected to the same level as the vents when they pass through the machine room.

Assembly Action:

None

PART II C IBC GENERAL

Committee Action:

Approved as Submitted

Committee Reason: Fire resistance rating® is more appropriate terminology than fire protection rating® when referring to enclosure of ducts as such protection it is not being used in the context of opening protection.

Assembly Action:

None

Final Hearing Results

FS59-06/07, Part I	D
FS59-06/07, Part II	AS

Code Change No: **FS60-06/07**

Original Proposal

Section: 707.14.2.3.3

Proponent: Edward A. Donoghue, Edward A. Donoghue Associates, Inc., representing National Elevator Industry, Inc.

Revise as follows:

707.14.2.3.3 Separate systems. A separate fan system shall be used for each ~~bank of elevators~~ hoistway.

Reason: The purpose of this code change is to correct an apparent mistake in the 2006 code. A "bank of elevators" is a group of elevators or a single elevator controlled by a common operating system; that is, all those elevators that respond to a single call button constitute a bank of elevators. There is no limit on the number of elevator cars that may be in a bank or group, but there may not be more than four elevator cars within a common hoistway (Section 3002.2). A hoistway is constructed as a shaft (Section 3002.1) and would be separated from all other hoistways. The code will require at least two separate hoistways where four or more elevator cars serve all or the same portion of a building. It would therefore appear to be better, and also the intent, that a separate fan system be provided for each separate hoistway (shaft enclosure) instead of allowing a single fan to serve multiple hoistways. The redundancy of protection provided by having a separate fan serve each separate hoistway enclosure will provide a higher margin of safety than allowing a single fan to serve an entire bank of elevators. As the text is currently written, most buildings would only have a single fan system. The revision would mean that in a building where four or more elevator cars were installed which served the same portion of a building, at least two fan systems would be installed so that each separate hoistway (shaft enclosure) would be independently protected.

Cost Impact: This code change proposal will increase the cost of construction by possibly requiring additional fans. This increase may be somewhat offset because the cost of a smaller fan should be less than a large fan.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: This proposal does clarify an apparent mistake in the 2006 edition of the code. This uses a term which is defined within the elevator standard and it uses it correctly.

Assembly Action:

None

Final Hearing Results

FS60-06/07

AS

Code Change No: **FS66-06/07**

Original Proposal

Sections: 419.2, 419.3, 708.1, 711.3**Proponent:** Philip Brazil, P.E, Reid Middleton, Inc., representing himself**1. Revise as follows:**

419.2 Separation walls. Walls separating dwelling units in the same building and walls separating sleeping units in the same building shall ~~comply~~ be constructed as fire partitions in accordance with Section 708.

419.3 Horizontal separation. Floor/~~ceiling~~ assemblies separating dwelling units in the same buildings and floor/~~ceiling~~ assemblies separating sleeping units in the same building shall be constructed as horizontal assemblies in accordance with Section 711.

2. Revise as follows:

708.1 General. The following wall assemblies shall comply with this section.

1. Walls separating dwelling units in the same building as required by Section 419.2.
2. Walls separating sleeping units in ~~occupancies in Group R-1 hotel, R-2 and I-1 occupancies~~ the same building as required by Section 419.2.
3. Walls separating tenant spaces in covered mall buildings as required by Section 402.7.2.
4. Corridor walls as required by Section 1017.1.
5. Elevator lobby separation as required by Section 707.14.1.
6. ~~Residential aircraft hangars.~~

711.3 Fire-resistance rating. The fire-resistance rating of floor and roof assemblies shall not be less than that required by the building type of construction. Where the floor assembly separates mixed occupancies, the assembly shall have a fire-resistance rating of not less than that required by Section 508.3.2 based on the occupancies being separated. Where the floor assembly separates a single occupancy into different fire areas, the assembly shall have a fire-resistance rating of not less than that required by Section 706.3.9. ~~Floor~~ Horizontal assemblies separating dwelling units in the same building ~~or and horizontal assemblies separating sleeping units in occupancies in Group R-1, hotel occupancies, R-2 and I-1 the same building~~ shall be a minimum of 1-hour fire-resistance-rated construction.

Exception: Dwelling unit and sleeping unit separations in buildings of Types IIB, IIIB, and VB construction shall have fire-resistance ratings of not less than 1/2 hour in buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.

Reason: The purpose of this proposal is eliminate overlapping charging language for fire containment assemblies consisting of fire partitions and horizontal assemblies between dwelling units in the same building and sleeping in the same building. The charging language in Section 708.1 for fire partitions and Section 711.3 for horizontal assemblies has existed in the IBC for several years. In the 2004/2005 code development cycle, however, a new Section 419.1 was approved adding charging language that overlaps and conflicts with the language in Sections 708.1 and 711.3.

In Section 419.2, "comply with" is changed to "be constructed as fire partitions in accordance with" in order to establish clear charging language.

In Section 419.3, "floor/ceiling assemblies" are changed to "floor assemblies" for consistency with the charging language for floor and roof assemblies in Section 711.1. Note that floor and roof assemblies, not floor/ceiling and roof/ceiling assemblies, required to have a fire-resistance rating are, in turn, required to comply with Section 711 on horizontal assemblies. Note also that "horizontal assembly" is defined in Section 702.1 as a fire-resistance-rated floor or roof assembly. The current language in Section 419.3 intends to require a fire-resistance rating between dwelling units and sleeping units but it fails to do so by merely referencing the technical provisions in Section 711.

In Item #6 of Section 708.1, the reference is deleted for consistency with Section 412.3.2 which was modified in the 2006 edition to require a fire barrier.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: It is appropriate to delete Section 708.1 item 6 as indicated. Section 412.3.2 was revised by G50-03/04 (AM) to require a fire barrier for that separation.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: This proposal coordinates the requirements with the appropriate sections of the code which regulate the separation and is consistent with the other items in this section. This will help clarify the requirements and make the code easier to use. The deletion of item 6 provides consistency with other sections of the code which were modified in the last code change cycle to require a fire barrier instead of a fire partition.

Assembly Action:

None

Final Hearing Results

FS66-06/07

AS

Code Change No: FS68-06/07

Original Proposal

Section: 708.3

Proponent: Gregory R. Keith, Professional heuristic Development, representing The Boeing Company

Revise as follows:

708.3 Fire-resistance rating. Fire partitions shall have a fire-resistance rating of not less than 1 hour.

Exceptions:

1. Corridor walls ~~as permitted~~ to have a 0.5 hour fire-resistance rating by Table 1017.1.
2. Dwelling and sleeping unit separations in buildings of Type IIB, IIIB and VB construction shall have fire-resistance ratings of not less than $\frac{1}{2}$ hour in buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.

Reason: The purpose of this proposal is to clarify that Table 1017.1 reduces the fire-resistance rating by one-half hour, it does not eliminate the rating requirement for corridors in Group R occupancies.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The reference to Table 1017.1 is more appropriate since that table does permit non-rated corridor walls for many occupancies when the occupant load is less than 10 or if other means of protection are provided. If the ratings exceptions are added, it raises the question of whether it is appropriate to only list the 2 hour exception or if the section should also address the non-rated corridors even though a non-rated corridor wall is not a fire partition. The committee felt that reference to Table 1017.1 in the existing exception is the correct and appropriate manner to address all possible scenarios.

Assembly Action:

None

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Gregory R. Keith, Professional heuristic Development, representing the Boeing Company, requests Approval as Submitted.

Commenter's Reason: The purpose of this proposal is to clarify that Table 1017.1 reduces the fire-resistance rating by one-half hour; it does not eliminate the rating requirement for corridors in Group R occupancies. During committee discussion in Orlando, and as indicated in the published reason for committee disapproval, there was a comment that this proposal may be inappropriate because it does not address non-rated corridors even though a non-rated corridor wall is not a fire partition. The committee felt that it was preferable to retain the current language as it addressed all possible scenarios. This was based on one committee member's comment that Table 1017.1 contained "0" rating requirements, which are also less than 1-hour. We contend that the current vague general provision creates more confusion than it corrects. As was indicated in the published reason, a non-rated corridor permitted by Table 1017.1 does not require a fire partition and as such, there is no reason to go to Section 708.3. In context, Exception 1 to Section 708.3 only applies to the reduction from the normally required one-hour fire partition rating to a one-half hour rating when specified by Table 1017.1. Approval of this proposal as submitted will clarify fire partition rating requirements and lend to uniformity in the interpretation and application of very important corridor wall rating requirements.

Final Hearing Results

FS68-06/07

AS

Code Change No: FS69-06/07

Original Proposal

Sections: 708.4, 711.4

Proponent: Philip Brazil, P.E, Reid Middleton, Inc., representing himself

Revise as follows:

708.4 Continuity. Fire partitions shall extend from the top of the foundation or floor/ceiling assembly below to the underside of the floor or roof sheathing, slab or deck above or to the fire-resistance-rated floor/ceiling or roof/ceiling assembly above, and shall be securely attached thereto. If the partitions are not continuous to the sheathing, deck or slab, and where constructed of combustible construction, the space between the ceiling and the sheathing, deck or slab above shall be fireblocked or draftstopped in accordance with Sections 717.2 and 717.3 at the partition line. The supporting construction shall be protected to afford the required fire-resistance rating of the wall supported, except for walls separating tenant spaces in covered mall buildings, and walls separating sleeping units ~~separation walls~~ and corridor walls, in buildings of Types IIB, IIIB, and VB construction.

Exceptions:

1. The wall need not be extended into the crawl space below where the floor above the crawl space has a minimum 1-hour fire-resistance rating.
2. Where the room-side fire-resistance-rated membrane of the corridor is carried through to the underside of the floor or roof sheathing, deck or slab of a fire-resistance-rated floor or roof above, the ceiling of the corridor shall be permitted to be protected by the use of ceiling materials as required for a 1-hour fire-resistance-rated floor or roof system.
3. Where the corridor ceiling is constructed as required for the corridor walls, the walls shall be permitted to terminate at the upper membrane of such ceiling assembly.
4. The fire partition separating tenant spaces in a covered mall building, complying with Section 402.7.2, are not required to extend beyond the underside of a ceiling that is not part of a fire-resistance-rated assembly. A wall is not required in attic or ceiling spaces above tenant separation walls.
5. Fireblocking or draftstopping is not required at the partition line in Group R-2 buildings that do not exceed four stories in height, provided the attic space is subdivided by draftstopping into areas not exceeding 3,000 square feet (279 m²) or above every two dwelling units, whichever is smaller.
6. Fireblocking or draftstopping is not required at the partition line in buildings equipped with an automatic sprinkler system installed throughout in accordance with Section 903.3.1.1 or 903.3.1.2, provided that automatic sprinklers are installed in combustible floor/ceiling and roof/ceiling spaces.

711.4 Continuity. Assemblies shall be continuous without openings, penetrations or joints except as permitted by this section and Sections 707.2, 712.4, 713 and 1020.1. Skylights and other penetrations through a fire-resistance-rated roof deck or slab are permitted to be unprotected, provided that the structural integrity of the fire-resistance-rated roof construction is maintained. Unprotected skylights shall not be permitted in roof construction required to be fire-resistance rated in accordance with Section 704.10. The supporting construction shall be protected to afford the required fire-resistance rating of the horizontal assembly supported.

Exception: In buildings of Type IIB, IIIB or VB construction, the construction supporting the horizontal assembly is not required to be fire-resistance-rated at the following:

1. Horizontal assemblies at the separations of incidental uses as specified by Table 508.2, provided the required fire-resistance rating does not exceed 1-hour.
2. Horizontal assemblies at the separations of sleeping units as required by Section 419.3.
3. Horizontal assemblies at smoke barriers constructed in accordance with Section 709.

714.1 Requirements. The fire-resistance rating of structural members and assemblies shall comply with the requirements for the type of construction and shall not be less than the rating required for the fire-resistance-rated assemblies supported.

Exception: Fire barriers, fire partitions, ~~and~~ smoke barriers and horizontal assemblies as provided in Sections 706.5, 708.4, ~~and~~ 709.4 and 711.4, respectively.

Reason: The purpose of the proposal is to eliminate apparent conflicts in the provisions for the fire resistance of construction supporting fire containment assemblies in buildings of Types IIB, IIIB and VB construction. The continuity provisions for fire barriers, shaft enclosures (by reference to the provisions for fire barriers) and fire partitions and smoke barriers typically require the supporting construction to be protected with fire-resistance-rated construction at least equal to that of the fire containment assembly being supported. The continuity provisions for all but horizontal assemblies, however, exempt supporting construction from the requirement to be fire-resistance-rated in buildings of Types IIB, IIIB and VB construction in certain circumstances.

A horizontal assembly is defined in Section 702.1 as being fire-resistance-rated. Horizontal assemblies are required by numerous provisions in the IBC and IFC. Many of these provisions specify a separation consisting of fire barriers or horizontal assemblies, or both. In this regard, the horizontal assembly is considered equivalent to the fire barrier.

Sections 419.2 and 419.3 on walls and floor/ceiling assemblies separating dwelling units and sleeping units intend to require them to be fire-resistance-rated in accordance with Section 708 for fire partitions and Section 711 for horizontal assemblies, respectively. In this regard, the horizontal assembly is considered equivalent to the fire partition. A separate proposal addresses the intended changing language in Sections 419.2 and 419.3.

The continuity provisions for fire barriers and fire partitions and smoke barriers currently exempt supporting construction from the requirement to be fire-resistance-rated in the following circumstances:

1. Fire barriers: 1-hour fire-resistance-rated incidental use area separations as required by Table 508.2.
2. Fire partitions: tenant and sleeping unit separation walls and corridor walls.
3. Smoke barriers: all cases.

This proposal exempts the supporting construction of horizontal assemblies in the same manner as the code currently exempts the supporting construction of fire barriers and fire partitions and smoke barriers but only in those circumstances where the horizontal assembly is a component of the same fire containment assembly as the fire barrier or fire partition or smoke barrier. It is not reasonable to exempt construction supporting a fire containment assembly for some components of the assembly but not for other components. If the exemptions for buildings of Types IIB, IIIB and VB construction are valid, they should be applied to the entire fire containment assembly, not just a portion of it.

Item #2 of the proposed exception to Section 711.4 is limited to sleeping units, which appears to exclude dwelling units, tenant spaces in covered mall buildings and corridors. Dwelling units are not included because the current exemption from the requirement for fire-resistance-rated construction at the supporting construction of fire partitions also excludes dwelling units (see Section 708.4). Tenant spaces in covered mall buildings and corridors are not included because the fire partitions required in these cases are limited to walls. Horizontal assemblies in combination with fire partitions are currently not required for them as is the case for separations between dwelling units and sleeping units (see Sections 419.2 and 419.3).

In Exception #4 to Section 708.4, "mall" is changed to "covered mall building" for consistency with the provisions of Section 402.7.2 on the separation of tenant spaces in covered mall buildings. Note that Sections 402.7 and 402.7.2 state that a tenant separation wall is not required between tenant spaces and the mall.

The other revisions in Section 708.4 are for consistency with the assemblies listed in Section 708.1 as requiring compliance with Section 708. The changes in Section 714.1 are for coordination with the changes in Section 711.4

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Modified

Modify the proposal as follows:

708.4 Continuity. Fire partitions shall extend from the top of the foundation or floor/ceiling assembly below to the underside of the floor or roof sheathing, slab or deck above or to the fire-resistance-rated floor/ceiling or roof/ceiling assembly above, and shall be securely attached thereto. If the partitions are not continuous to the sheathing, deck or slab, and where constructed of combustible construction, the space between the ceiling

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and the sheathing, deck or slab above shall be fireblocked or draftstopped in accordance with Sections 717.2 and 717.3 at the partition line. The supporting construction shall be protected to afford the required fire-resistance rating of the wall supported, except for walls separating tenant spaces in covered mall buildings, walls separating dwelling units, sleeping units and corridor walls, in buildings of Types IIB, IIIB, and VB construction.

711.4 Continuity. Assemblies shall be continuous without openings, penetrations or joints except as permitted by this section and Sections 707.2, 712.4, 713 and 1020.1. Skylights and other penetrations through a fire-resistance-rated roof deck or slab are permitted to be unprotected, provided that the structural integrity of the fire-resistance-rated roof construction is maintained. Unprotected skylights shall not be permitted in roof construction required to be fire-resistance rated in accordance with Section 704.10. The supporting construction shall be protected to afford the required fire-resistance rating of the horizontal assembly supported.

Exception: In buildings of Type IIB, IIIB or VB construction, the construction supporting the horizontal assembly is not required to be fire-resistance-rated at the following:

1. Horizontal assemblies at the separations of incidental uses as specified by Table 508.2, provided the required fire-resistance rating does not exceed 1-hour.
2. Horizontal assemblies at the separations of dwelling units and sleeping units as required by Section 419.3.
3. Horizontal assemblies at smoke barriers constructed in accordance with Section 709.

Committee Reason: This provides consistency with the existing wall exceptions. The concern was that if vertical elements (walls) do not need the continuity, then why do the floors? The modifications made by the committee inserted dwelling units into both Section 708.4 and the exception in Section 711.4. These modifications were needed so that both sleeping units and dwelling units are regulated in the same manner.

Assembly Action:

None

Final Hearing Results

FS69-06/07

AM

Code Change No: FS75-06/07

Original Proposal

Sections: 711.1, 712.4

Proponent: Gregory R. Keith, Professional heuristic Development, representing The Boeing Company

Revise as follows:

711.1 General. Floor and roof assemblies required to have a fire-resistance rating shall comply with this section.

Exception: Nonfire-resistance-rated horizontal assemblies shall comply with Section 712.4.2.

712.4 Horizontal assemblies. Penetrations of a floor, floor/ceiling assembly or the ceiling membrane of a roof/ceiling assembly shall be protected in accordance with Section 707 or this section.

Reason: This proposal is intended to clarify very important penetration requirements associated with the construction of horizontal assemblies. Fundamental charging language currently contained in Section 712.4 would indicate that penetrations in horizontal assemblies would only be protected in accordance with Section 707 with shaft enclosures. Obviously, penetrations could also be protected in accordance with Sections 712.4.1 and 712.4.2. Accordingly, the section is proposed to be amended to reflect both acceptable solutions.

Additionally, Section 712.4.2 provides penetration protection requirements for nonfire-resistance-rated horizontal assemblies. These provisions tend to go unnoticed as many persons do not necessarily associate protection requirements with nonrated assemblies. Section 711.5 lends to this confusion in stating, "Penetrations through fire-resistance-rated horizontal assemblies shall comply with Section 712." The inference being, perhaps, that penetrations through nonfire-resistance-rated horizontal assemblies need not comply with Section 712. To assist users in the proper determination of penetration protection requirements in nonrated assemblies, a cross reference has been added to Section 711.1. The exception was not made to Section 711.5 as the general charging language in Section 711.1 would indicate that the provisions of the section would only apply to rated horizontal assemblies.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Modified

Modify the proposal as follows:

711.1 General. Floor and roof assemblies required to have a fire-resistance rating shall comply with this section. **Exception:** Nonfire-resistance-rated ~~horizontal~~ floor and roof assemblies shall comply with Section 712.4.2.

712.4 Horizontal assemblies. Penetrations of a floor, floor/ceiling assembly or the ceiling membrane of a roof/ceiling assembly shall be protected in accordance with Section 707 or this section.

Committee Reason: This will help to flag the requirements which are applicable to non-rated assemblies in Section 712.4.2 so that they are not missed. Because Sections 711 and 712.4 are generally dealing with rated assemblies, the requirements which of 712.4.2 are often ignored or overlooked. Whether these items should be applied to penetrations of the roof is questionable. The modification eliminated the exception and made it the second sentence in Section 711.1. It also revised the text of the proposed exception to reference "floor and roof" assemblies.

Assembly Action:**None**

Final Hearing Results

FS75-06/07

AM

Code Change No: FS77-06/07

Original Proposal

Sections: 712.3, 712.4

Proponent: Sarah A. Rice, CBO, Schirmer Engineering Corp., representing American Hotel & Lodging Association (AH&LA)

Revise as follows:

712.3 Fire-resistance-rated walls. Penetrations into or through fire walls, fire-barriers ~~walls~~, smoke-barrier walls and fire partitions shall comply with Sections 712.3.1 through 712.3.4. Penetrations in smoke barrier walls shall also comply with 712.5.

712.4.1 Fire-resistance rated assemblies. Penetrations of the fire-resistance rated floor, floor/ceiling assembly or the ceiling membrane of a roof/ceiling assembly shall comply with Sections 712.4.1.1 through 714.4.1.5. Penetrations in horizontal smoke barriers shall also comply with 712.5.

Reason: A new section has been added to Section 712 to specifically address penetrations in smoke barriers, Section 712.5. The proposed language makes it clear that penetrations in smoke barriers, whether horizontal or vertical, are to comply with only Section 712.5.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:**Approved as Submitted**

Committee Reason: The additional text helps to clarify the requirements and will provide a direct reference to address the smoke barrier penetrations in both walls and horizontal assemblies.

Assembly Action:**None**

Final Hearing Results

FS77-06/07

AS

Code Change No: **FS82-06/07**

Original Proposal

Section: 712.3.2

Proponent: Tony Crimi, A.C. Consulting Services Inc., representing International Firestop Council

Revise as follows:

712.3.2 Membrane penetrations. Membrane penetrations shall comply with Section 712.3.1. Where walls or partitions are required to have a fire-resistance rating, recessed fixtures shall be installed such that the required fire resistance will not be reduced.

Exceptions:

1. Membrane penetrations of maximum two-hour fire-resistance-rated walls and partitions by steel electrical boxes that do not exceed 16 square inches (0.0103 m²) in area, provided the aggregate area of the openings through the membrane does not exceed 100 square inches (0.0645 m²) in any 100 square feet (9.29m²) of wall area. The annular space between the wall membrane and the box shall not exceed 1/8 inch (3.1 mm). Such boxes on opposite sides of the wall or partition shall be separated by one of the following:
 - 1.1. By a horizontal distance of not less than 24 inches (610 mm);
 - 1.2. By a horizontal distance of not less than the depth of the wall cavity where the wall cavity is filled with cellulose loose-fill, rockwool or slag mineral wool insulation;
 - 1.3. By solid fireblocking in accordance with Section 717.2.1;
 - 1.4. By protecting both outlet boxes with listed putty pads; or
 - 1.5. By other listed materials and methods.
2. Membrane penetrations by listed electrical boxes of any material, provided such boxes have been tested for use in fire-resistance-rated assemblies and are installed in accordance with the instructions included in the listing. The annular space between the wall membrane and the box shall not exceed 1/8 inch (3.1 mm) unless listed otherwise. Such boxes on opposite sides of the wall or partition shall be separated as follows:
 - 2.1. By a horizontal distance of not less than 24 inches (610 mm);
 - 2.2. By solid fireblocking in accordance with Section 717.2.1;
 - 2.3. By protecting both boxes with listed putty pads; or
 - 2.4. By other listed materials and methods.
3. Membrane penetrations by electrical boxes of any size or type, which have been listed as part of a wall opening protective material system for use in fire-resistance-rated assemblies and are installed in accordance with the instructions included in the listing.
- ~~3- 4.~~ The annular space created by the penetration of a fire sprinkler, provided it is covered by a metal escutcheon plate.

Reason: To add a new exception to the Code related to membrane penetrations of fire resistance rated assemblies in Section 712.3.2 for membrane penetrations.

The addition of this new exception will permit additional tested and listed systems to be used to protect membrane penetrations in fire resistance rated assemblies.

Section 712.3.2 of the IBC already permits several exceptions to the basic requirement for recessed fixtures to be installed such that the required fire resistance rating will not be reduced by the membrane penetrations. In the same way, Certification and Listing Agencies have published Listings covering proprietary compositions that are used to maintain the hourly ratings of fire resistive walls and partitions incorporating flush mounted devices such as outlet boxes, electrical cabinets, and mechanical cabinets penetrating membranes of fire resistance rated assemblies. The individual systems indicate the specific applications and the method of installation for which the materials have been evaluated. The basic standards used to investigate these products is ANSI/UL 263 and ASTM E119.

For example, UL Classifies these materials and systems as "Wall Opening Protective Materials". This category includes Classifications for both generic steel electrical boxes as well as specific types and models of outlet and switch boxes composed of other materials, all listed for specific usage in fire resistive rated wall assemblies. The UL Listings for wall opening protective materials indicates that, depending upon the testing conducted for the individual Listing, their use can allow for any combination of; (1) reducing the spacing between boxes contained on opposite sides of the wall, (2) increasing the size of the boxes, (3) increasing the density of boxes, and/or (4) allowing the use of boxes on each side of staggered stud walls. Because these systems are tested for the specific end-use applications, the individual and aggregate restrictions on maximum sizes and quantities (i.e. 16 sq in for an individual box, and the aggregate maximum of 100 sq in. per 100 sq ft.) are not required for these systems to maintain the fire resistance ratings of the assemblies penetrated.

The information provided for each Classification includes the model numbers for the Classified products, a description of the rated assemblies, the spacing limitations for the boxes and the installation details.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: This addresses a new UL listing category. These are listed products and are applicable for this use. This new text is needed in the code to permit these new listed systems to be accepted. This code change was preferred over FS81-06/07 because it addresses the size of the boxes, addresses both issues and provides additional flexibility in designs.

Assembly Action:

None

Final Hearing Results

FS82-06/07

AS

Code Change No: FS85-06/07

Original Proposal

Sections: 702.1, 712.3.3 (New)

Proponent: Tony Crimi, A.C., Consulting Solutions Inc., representing International Firestop Council

1. Add new text as follows:

702.1 Definitions. The following words and terms shall, for the purposes of this chapter, and as used elsewhere in this code, have the meanings shown herein.

UTILITY BOXES. An enclosure constructed for indoor use to provide a degree of mechanical Protection to equipment or materials.

2. Add new text as follows:

712.3.3 Utility Boxes. Through penetrations shall comply with Section 712.3.1. Where walls or partitions are required to have a fire-resistance rating, membrane penetrations by utility boxes shall be protected by an approved membrane penetration firestop system installed as tested in accordance with ASTM E 814 or UL 1479, with a minimum positive pressure differential of 0.01 inch (2.49 Pa) of water, and shall have an F and T rating of not less than the required fire-resistance rating of the wall penetrated and be installed in accordance with the instructions included in the listing.

(Renumber subsequent sections)

Reason: To add a new allowance which expands upon the ability to install utility boxes such as electrical panels, dryer exhaust boxes, washing machine hose connection boxes and manual fire alarm pull boxes in fire resistance rated assemblies when properly protected.

There are many types of utility boxes installed in fire resistance rated walls, where the membrane penetrations need to be protected. The addition of this new requirement will both permit these general utility boxes to be used and provide some assurance that any box or cabinet penetrations will not compromise the fire resistance rating of the wall.

The IBC currently permits both metallic and nonmetallic electrical boxes to be installed, under specified conditions, in fire resistance rated assemblies. Section 712.3.2 also permits membrane penetrations by listed electrical boxes of any material, provided such boxes have been tested for use in fire-resistance-rated assemblies and are installed in accordance with the instructions included in the listing. These membrane penetrations in fire resistance rated walls are permitted when evaluated for such installations and provided with the appropriate testing in accordance with Section 712. However, there still exists a need to introduce requirements to cover a variety of other types of general utility boxes such as fire or police alarm boxes, manual fire alarm boxes, switch boxes, valve boxes, special purpose boxes, electrical panels, washer and dryer boxes, and hose cabinets.

This code change proposal would create a direct parallel between the requirements for electrical outlet boxes and these utility boxes. The protection systems are to be tested for use in fire-resistance-rated assemblies and installed in accordance with the instructions included in the listings. However, because these utility boxes can exceed 100 square inches aggregate area, both an F and T rating should be required in order to be directly equivalent to the fire resistance rating of the assemblies penetrated. Given that these are membrane penetrations, there is a greater likelihood that someone could unknowingly place or store combustible materials, potentially even furniture and bedding, directly in contact with the un-penetrated membrane on the opposite side of the wall. This could significantly increase threat of fire spread.

The information provided for each Classification would include the model numbers for the products, a description of the rated assemblies, the spacing limitations for the boxes and the installation details.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The term Amechanical® protection which is used within the definition is not a defined or clear term. Therefore the committee was uncertain as to what this statement was intended to provide. This proposal would require a AT® rating for the wall which typically would only require an AF® rating or allow the use of a number of exceptions. There is also uncertainty regarding whether an electrical outlet box or a fire alarm box may also be considered as a Autility box.® If the definition would require an F and T rating for the outlet boxes that would be contrary to years of testing and also the provisions found Section 712.3.3 Exceptions 1 and 2. It may also seem inconsistent to permit an outlet box to use the typical methods of protection and yet require the F and T ratings for these utility boxes. The provision does not distinguish between the sizes of the box when establishing the requirements.

Assembly Action:

None

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Tony Crimi, A.C. Consulting Solutions Inc. representing International Firestop Council, requests Approval as Modified by this public comment.

Replace proposal with the following:

712.3.2 Membrane penetrations. Membrane penetrations shall comply with Section 712.3.1. Where walls or partitions are required to have a fire-resistance rating, recessed fixtures shall be installed such that the required fire resistance will not be reduced.

Exceptions:

1. Membrane penetrations of maximum two-hour fire-resistance-rated walls and partitions by steel electrical boxes that do not exceed 16 square inches (0.0103 m²) in area provided the aggregate area of the openings through the membrane does not exceed 100 square inches (0.0645 m²) for any 100 square feet (9.29 m²) of wall area. The annular space between the wall membrane and the box shall not exceed 1/8 in. (3.1 mm). Such boxes on opposite sides of the wall or partition shall be separated by one of the following:
 - 1.1. By a horizontal distance of not less than 24 inches (610 mm)
 - 1.2. By a horizontal distance of not less than the depth of the wall cavity where the wall cavity is filled with cellulose loose fill, rockwool or slag mineral wool insulation;
 - 1.3. By solid fireblocking in accordance with Section 717.2.1;
 - 1.4. By protecting both boxes with listed putty pads; or
 - 1.5. By other listed materials and methods.
2. Membrane penetrations by listed electrical boxes of any material provided such boxes have been tested for use in fire-resistance-rated assemblies and are installed in accordance with the instructions included in the listing. The annular space between the wall membrane and the box shall not exceed 1/8 in. (3.1 mm) unless listed otherwise. Such boxes on opposite sides of the wall or partition shall be separated as follows:
 - 2.1. By a horizontal distance of not less than 24 inches (610 mm);
 - 2.2. By solid fireblocking in accordance with Section 717.2.1;
 - 2.3. By protecting both boxes with listed putty pads; or
 - 2.4. By other listed materials and methods.
3. Membrane penetrations by boxes other than electrical boxes provided such penetrating items and the annular space between the wall membrane and the box, are protected by an approved membrane penetration firestop system installed as tested in accordance with ASTM E 814 or UL 1479, with a minimum positive pressure differential of 0.01 inch (2.49 Pa) of water, and shall have an F and T rating of not less than the required fire-resistance rating of the wall penetrated and be installed in accordance with the instructions included in the listing.

3 4. The annular space created by the penetration of an automatic sprinkler provided it is covered by a metal escutcheon plate.

Commenter's Reason: There are many other types of utility boxes and enclosures installed in fire resistance rated walls, where the membrane penetrations need to be protected. The addition of this new requirement will both permit these general utility boxes to be used and provide some assurance that any box or cabinet penetrations will not compromise the fire resistance rating of the wall. The original proposal submitted has been modified here to reflect the Committee's comments about the language introducing the defined term "Utility Box". Consequently, that definition has been eliminated from the proposal.

There still exists a need to introduce requirements to cover a variety of other types of general utility boxes such as dryer exhaust boxes, washing machine hose connection boxes, fire or police alarm boxes, manual fire alarm boxes, switch boxes, valve boxes, special purpose boxes, electrical panels and hose cabinets. This Code change proposals would treat these other box enclosures in a similar manner to what is already required in the charging statement in section 712.3.2. The protection systems are to be tested to demonstrate compare performance to fire-resistance-rated assemblies and installed in accordance with the instructions included in the listings.

The IBC currently permits both metallic and nonmetallic electrical boxes to be installed, under specified conditions, in fire resistance rated assemblies. Section 712.3.2 permits membrane penetrations by listed electrical boxes of any material, provided such boxes have been tested for use in fire-resistance-rated assemblies and are installed in accordance with the instructions included in the listing. The charging statement in 712.3.2 states that "...recessed fixtures shall be installed such that the required fire resistance will not be reduced." Consequently, these provisions already require the F and T ratings to be applied. Exceptions 712.3.2 (1) through (3) impose additional restrictions on the size, type and use of electrical boxes specifically. However, for other types of boxes that may be installed, there is no such exception to the existing F and T (i.e. fire resistance) rating. Further, because these utility boxes can easily exceed the 100 square inches aggregate area limit that exists for electrical boxes, both an F and T rating should continue to be required in order to maintain the performance level directly equivalent to the fire resistance rating of the assemblies penetrated. Given that these are membrane penetrations, there is a greater likelihood that someone could unknowingly place or store combustible materials, potentially even furniture and bedding, directly in contact with the un-penetrated membrane on the opposite side of the wall. This could significantly increase threat of fire spread.

Final Hearing Results

FS85-06/07
AMPC1

Code Change No: FS86-06/07

Original Proposal

Section: 712.4

Proponent: Sarah A. Rice, C.B.O., Schirmer Engineering Corp., representing American Hotel & Lodging Association (AH&LA)

Revise as follows:

712.4 Horizontal assemblies. Penetrations of a floor, floor/ceiling assembly or the ceiling membrane of a roof/ceiling assembly not required to be enclosed in a shaft by Section 707.2 shall be protected in accordance with Sections 712.4.1 through 712.4.4 ~~707~~.

Reason: The proposed language is intended to add clarity to the provisions. The penetration protection methods in Sections 712.4 are permitted only to the extent indicated in Section 707.2.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:
Approved as Submitted

Committee Reason: This proposal will provide pointers to the applicable sections. This will provide clarity and make the code easier to use by referring to the exceptions in Section 707.2.

Assembly Action:
None

Final Hearing Results

FS86-06/07
AS

Code Change No: **FS89-06/07**

Original Proposal

Section: 712.4.1.2

Proponent: Tony Crimi, A.C., Consulting Solutions Inc., representing International Firestop Council

Revise as follows:

712.4.1.2 Membrane penetrations. Penetrations of membranes that are part of a fire-resistance-rated horizontal assembly shall comply with Section 712.4.1.1.1 or 712.4.1.1.2. Where floor/ceiling assemblies are required to have a ~~minimum 1-hour~~ fire-resistance rating, recessed fixtures shall be installed such that the required fire resistance will not be reduced.

Exceptions:

1. Membrane penetrations of maximum 2-hour fire-resistance-rated walls and partitions by steel, ferrous or copper conduits, pipes, tubes or vents, or concrete or masonry items where the annular space is protected either in accordance with Section 712.4.1.1 or to prevent the free passage of flame and the products of combustion. The aggregate area of the openings through the membrane shall not exceed 100 square inches (64 500 mm²) in any 100 square feet (9.3m²) of ceiling area in assemblies tested without penetrations.
2. Ceiling membrane penetrations of maximum 2-hour fire-resistance-rated horizontal assemblies by steel electrical boxes that do not exceed 16 square inches (10 323 mm²) in area, provided the aggregate area of such penetrations does not exceed 100 square inches (44 500 mm²) in any 100 square feet (9.29m²) of ceiling area, and the annular space between the ceiling membrane and the box does not exceed 1/8 inch (3.12 mm).
3. Membrane penetrations by listed electrical boxes of any material, provided such boxes have been tested for use in fire-resistance-rated assemblies and are installed in accordance with the instructions included in the listing. The annular space between the ceiling membrane and the box shall not exceed 1/8 inch (3.1 mm) unless listed otherwise.
4. The annular space created by the penetration of a fire sprinkler, provided it is covered by a metal eschutcheon plate.

Reason: To delete the threshold value of 1 h in Section 714.1.2 for membrane penetrations in horizontal assemblies to make it consistent with 712.3.2 for membrane penetrations in fire resistance rated walls.

In the 2006 IBC cycle, 1/2 h fire-resistance ratings were introduced into additional occupancies. Membrane penetrations in these assemblies will still need to be protected in accordance with 712.4.1.2 in order to achieve the 1/2 h rating. When these 1/2 h ratings were introduced, the Code neglected to update this provision. This issue was corrected in 712.3.2 in the 2006 IBC, but also needs to be corrected in 712.4.1.2.

During a past cycle, Section 712.3.2 the IBC was revised to eliminate the 1 hour threshold value for recessed light fixtures installed as membrane penetrations in fire resistance rated walls. This was in recognition of the fact that 1/2 h ratings were introduced in a previous edition in combination with sprinkler trade offs in dwelling unit and sleeping unit separations in buildings of Type IIB, IIIB, and VB construction. The previous language in Section 712.3.2 and 712.4.1.2 for membrane penetrations was based on an assumption that, other than in R occupancies, the minimum fire-resistance ratings in the IBC were 1-h. Consequently, in those cases where the Committee felt a reduction to 1/2-h was warranted, and specifically did not reduce the ratings to 0-h as in some applications, protection of penetrations is still required in order to maintain the 1/2-h fire resistance rating. This is even more problematic and dangerous for a structural assembly like the floor. The risk is particularly severe for firefighters responding to residential occupancies, where they are likely to spend an extended amount of time to ensure that all occupants have evacuated safely. As currently written, the IBC inadvertently introduces the potential for an unlimited number of unprotected membrane penetrations through a required fire-resistance rated horizontal assembly, without any limitations as to their size or location.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: This proposal can help provide consistency with other code sections and coordinate with the fact that wall requirements allow for ratings less than 1-hour. This also recognizes that assemblies of any rating should maintain the protection at penetrations.

Assembly Action:

None

Final Hearing Results

FS89-06/07

AS

Code Change No: FS90-06/07

Original Proposal

Section: 712.4.1.2**Proponent:** Tony Crimi, A.C., Consulting Solutions Inc., representing International Firestop Council**Revise as follows:**

712.4.1.2 Membrane penetrations. Penetrations of membranes that are part of a fire-resistance-rated horizontal assembly shall comply with Section 712.4.1.1.1 or 712.4.1.1.2. Where floor/ceiling assemblies are required to have a minimum 1-hour fire-resistance rating, recessed fixtures shall be installed such that the required fire resistance will not be reduced.

Exceptions:

1. Membrane penetrations of maximum 2-hour fire-resistance-rated walls and partitions by steel, ferrous or copper conduits, pipes, tubes or vents, or concrete or masonry items where the annular space is protected either in accordance with Section 712.4.1.1 or to prevent the free passage of flame and the products of combustion. The aggregate area of the openings through the membrane shall not exceed 100 square inches (64 500 mm²) in any 100 square feet (9.3m²) of ceiling area in assemblies tested without penetrations.
2. Ceiling membrane penetrations of maximum 2-hour fire-resistance-rated horizontal assemblies by steel electrical boxes that do not exceed 16 square inches (10 323 mm²) in area, provided the aggregate area of such penetrations does not exceed 100 square inches (44 500 mm²) in any 100 square feet (9.29m²) of ceiling area, and the annular space between the ceiling membrane and the box does not exceed 1/8 inch (3.12 mm).
3. Membrane penetrations by electrical boxes of any size or type, which have been listed as part of a wall opening protective material system for use in horizontal fire-resistance-rated assemblies and are installed in accordance with the instructions included in the listing.
- ~~3.~~ 4. Membrane penetrations by listed electrical boxes of any material, provided such boxes have been tested for use in fire-resistance-rated assemblies and are installed in accordance with the instructions included in the listing. The annular space between the ceiling membrane and the box shall not exceed 1/8 inch (3.1 mm) unless listed otherwise.
- 4- 5. The annular space created by the penetration of a fire sprinkler, provided it is covered by a metal eschutcheon plate.

Reason: To add a new exception to the Code related to membrane penetrations of fire resistance rated assemblies in Section 712.4.1.2 for membrane penetrations.

The addition of this new exception will permit additional tested and listed systems to be used for membrane penetrations in fire resistance rated assemblies. Many of these systems already exist, and are being used in the marketplace. The IBC should recognize current common practice of a proven, regulated technology.

Section 712.4.1.2 of the IBC already permits several exceptions to the basic requirement for membrane penetrations to be installed so that the required fire resistance rating will not be reduced by the membrane penetrations. In the same way, Certification and Listing Agencies have published Listings covering proprietary compositions that are used to maintain the hourly ratings of fire resistive walls and partitions incorporating flush mounted devices such as outlet boxes, electrical cabinets, and mechanical cabinets penetrating membranes of fire resistance rated assemblies. The individual systems indicate the specific applications and the method of installation for which the materials have been evaluated. The basic standards used to investigate these products is ANSI/UL 263 and ASTM E 119.

For example, UL classifies nonmetallic outlet boxes for installation in floors, walls and partitions, and/or ceilings in accordance with the provisions of NFPA 70, "National Electrical Code" (NEC). These systems are required to provide a degree of fire resistance when installed in the particular floors, walls and/or ceiling assemblies. The systems Listed for this application include nonmetallic outlet and switch boxes for use in fire resistance rated wall assemblies. Listing information includes the model numbers for the products, a description of the rated assemblies in which they can be used, the spacing limitations for the boxes and the installation details.

Product Listings specify the conditions under which Listed metallic outlet and switch boxes may be installed within fire resistance rated wall assemblies constructed with bearing and nonbearing wood or steel studs and gypsum board facings. Listings also exist for nonmetallic outlet boxes along with the conditions under which such outlet and switch boxes may be installed within fire resistive wall assemblies. With either type of outlet or switch box, it may be possible to install the boxes under less stringent conditions when such boxes are used in conjunction with wall opening protective materials. Use of wall opening protective materials may allow for any combination of; (1) reducing the spacing between boxes contained on opposite sides of the wall, (2) increasing the size of the boxes, (3) increasing the density of boxes installed, and/or (4) allowing the use of boxes on each side of staggered stud walls. The individual systems tested for compliance in these categories indicate the specific applications and the method of installation for which the materials have been evaluated.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: This proposal provides additional flexibility with an additional design option. This will coordinate with the action taken on FS82-06/07 but address horizontal assemblies. See FS82-06/07 for additional comments.

Assembly Action:

None

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Jonathan C. Siu, City of Seattle, representing WABO Technical Code Development Committee, requests Approval as Modified by this public comment.

Modify proposal as follows:

712.4.1.2 Membrane penetrations. Penetrations of membranes that are part of a fire-resistance-rated horizontal assembly shall comply with Section 712.4.1.1.1 or 712.4.1.1.2. Where floor/ceiling assemblies are required to have a minimum 1-hour fire-resistance rating, recessed fixtures shall be installed such that the required fire resistance will not be reduced.

Exceptions:

1. Membrane penetrations of maximum 2-hour fire-resistance-rated walls and partitions by steel, ferrous or copper conduits, pipes, tubes or vents, or concrete or masonry items where the annular space is protected either in accordance with Section 712.4.1.1 or to prevent the free passage of flame and the products of combustion. The aggregate area of the openings through the membrane shall not exceed 100 square inches (64 500 mm²) in any 100 square feet (9.3m²) of ceiling area in assemblies tested without penetrations.
2. Ceiling membrane penetrations of maximum 2-hour fire-resistance-rated horizontal assemblies by steel electrical boxes that do not exceed 16 square inches (10 323 mm²) in area, provided the aggregate area of such penetrations does not exceed 100 square inches (44 500 mm²) in any 100 square feet (9.29m²) of ceiling area, and the annular space between the ceiling membrane and the box does not exceed 1/8 inch (3.12 mm).
3. Membrane penetrations by electrical boxes of any size or type, which have been listed as part of an wall opening protective material system for use in horizontal fire-resistance-rated assemblies and are installed in accordance with the instructions included in the listing.
4. Membrane penetrations by listed electrical boxes of any material, provided such boxes have been tested for use in fire-resistance-rated assemblies and are installed in accordance with the instructions included in the listing. The annular space between the ceiling membrane and the box shall not exceed 1/8 inch (3.1 mm) unless listed otherwise
5. The annular space created by the penetration of a fire sprinkler, provided it is covered by a metal escutcheon plate.

Commenters Reason: Editorial. The scope of this section is horizontal assemblies, so the term “wall opening protective” is not appropriate.

Final Hearing Results

FS90-06/07

AMPC1

Code Change No: FS91-06/07

Original Proposal

Section: 712.4.2

Proponent: Sarah A. Rice, C.B.O., Schirmer Engineering Corp., representing American Hotel & Lodging Association (AH&LA)

Revise as follows:

712.4.2 Nonfire-resistance-rated assemblies. Penetrations of ~~horizontal assemblies without a required fire-resistance rating~~ nonfire-resistance rated floor or floor/ceiling assemblies or the ceiling membrane of a nonfire-resistance rated roof/ceiling assembly shall meet the requirements of Section 707 or shall comply with Section 712.4.2.1 or 712.4.2.2.

Reason: The proposed change is editorial in nature, unintended to create consistency within Section 712.4. The new language proposed is identical to that found in Section 712.4.1.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:**Approved as Submitted**

Committee Reason: This revision provides clarity and consistency with the existing code text. The provision also distinguishes that only the ceiling portion of a roof/ceiling assembly is regulated.

Assembly Action:**None**

Final Hearing Results

FS91-06/07**AS**

Code Change No: FS98-06/07

Original Proposal

Table 601 and Sections: 714.1, 714.1.1 (New), 714.1.2 (New), 714.2, 714.2.1, 714.2.2, 714.3, 714.4

Proponent: Paul K. Heilstedt, PE, Chair, representing ICC Code Technology Committee (CTC)

Revise as follows:

**TABLE 601
FIRE-RESISTANCE RATING REQUIREMENTS FOR BUILDING ELEMENTS (hours)**

BUILDING ELEMENT	TYPE I		TYPE II		TYPE III		TYPE IV	TYPE V	
	A	B	A ^d	B	A ^d	B	HT	A ^d	B
Structural Primary structural frame^a See Section 714.1.1 Including columns, girders, trusses	3 ^b	2 ^b	1	0	1	0	HT	1	0
Bearing walls Exterior ^f Interior	3 3 ^b	2 2 ^b	1 1	0 0	2 1	2 0	2 1/HT	1 1	0 0
Nonbearing walls and partitions Exterior	See Table 602								
Nonbearing walls and partitions Interior ^e	0	0	0	0	0	0	See Section 602.4.6	0	0
Floor construction Including supporting beams and joists	2	2	1	0	1	0	HT	1	0
Roof construction Including supporting beams and joists	1½ ^c	1 ^{c,d}	1 ^{c,d}	0 ^{c,d}	1 ^{c,d}	0 ^{c,d}	HT	1 ^{c,d}	0

For SI: 1 foot = 304.8 mm.

~~a. The structural frame shall be considered to be the columns and the girders, beams, trusses and spandrels having direct connections to the columns and bracing members designed to carry gravity loads. The members of floor or roof panels which have no connection to the columns shall be considered secondary members and not a part of the structural frame.~~

b. through g. (No change to current text – re-letter to become a. through f.)

714.1 Requirements. The fire-resistance rating of structural members and assemblies shall comply with this section and the requirements for the type of construction as specified in Table 601 and shall not be less than the rating required for the fire-resistance-rated assemblies supported by the structural members.

Exception: Fire barriers, fire partitions and smoke barriers as provided in Sections 706.5, 708.4 and 709.4, respectively.

714.2 Protection of structural members. Protection of columns, girders, trusses, beams, lintels or other structural members that are required to have a fire-resistance rating shall comply with this section.

714.1.1 Primary structural frame. The primary structural frame shall be the columns and other structural members including the girders, beams, trusses and spandrels having direct connections to the columns and bracing members designed to carry gravity loads.

714.1.2 Secondary members. The members of floor or roof construction which are not connected to the columns shall be considered secondary members and not part of the primary structural frame

714.2.1 Individual encasement protection. Columns, girders, trusses, beams, lintels or other structural members that are required to have a fire-resistance rating and that support more than two floors or one floor and roof, or support a load-bearing wall or a nonload-bearing wall more than two stories high, shall be individually protected on all sides for the full length, including connections to other structural members, with materials having the required fire-resistance rating.

714.2.1 Alternative protection. The structural members that are required to have a fire-resistance rating and are not required to be provided individual encasement protection according to Section 714.2 ~~Other structural members required to have a fire-resistance rating~~ shall be protected by individual encasement protection, by a membrane or ceiling protection as specified in Section 711, or by a combination of both. ~~Columns shall also comply with Section 714.2.2.~~

714.2.1.1 714.3 Membrane protection. King studs and boundary elements that are integral elements in load-bearing walls of light-framed construction shall be permitted to have required fire-resistance ratings provided by the membrane protection provided for the load-bearing wall.

714.2.2 714.4 Column protection above ceilings. Where columns are required to be fire-resistance rated, the entire column, including its connections to beams or girders, shall be ~~protected~~ provided individual encasement protection on all sides for the full column length. Where the column extends through a ceiling, the fire resistance rating of the column shall be continuous from the top of the foundation or floor/ceiling assembly below through the ceiling space to the top of the column.

Reason: The ICC Board established the ICC Code Technology Committee (CTC) as the venue to discuss contemporary code issues in a committee setting which provides the necessary time and flexibility to allow for full participation and input by any interested party. The code issues are assigned to the CTC by the ICC Board as "areas of study". Information on the CTC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CTC effort can be downloaded from the following website: <http://www.iccsafe.org/cs/cc/ctc/index.html> Since its inception, the CTC has held six meetings - all open to the public.

This proposed change is a result of the CTC's investigation of the area of study entitled "Review of NIST WTC Recommendations". The scope of the activity is noted as:

Review the recommendations issued by NIST in its report entitled "Final Report on the Collapse of the World Trade Center Towers", issued September 2005, for applicability to the building environment as regulated by the I-Codes.

This proposal is intended to address NIST recommendation 7. For this specific proposed change, CTC is working in cooperation with the NIBS/MMC Committee to Translate the NIST World Trade Center Investigation Recommendations for the Model Codes. The CTC notes in their investigation that many of the recommendations contained in the NIST report require additional information for the CTC to further investigate. As such, CTC intends to continue to study the other NIST recommendations.

NIST Recommendation #7 is summarized as "NIST recommends the adoption and use of the structural frame approach to fire resistance ratings." While the IBC currently contains this approach, the NIST team recommends that the concept be reinforced by incorporating text similar to that contained in Footnote a to Table 601 into the pertinent code text for a higher visibility and understanding by code users.

The proposed modification to line 1, column 1 of Table 601 is not intended to revise the intent but to incorporate the revised term. In lieu of a footnote, reliance on the reference to the specific code text of Section 714.1.1 enables a better understanding of the requirements for the pertinent building elements.

The modifications to the subsections of Section 714 are intended to retain the current intent. The assemblies for floors and roofs are not consistently referred to as "panels" and the apparent intent is to deal with "floor and roof construction".

The modifications to the several subsections of Section 714 are intended to work in concert with the reference from Table 601 and consolidate text into a more efficient format without a change in intent.

714.1 – The section is revised by incorporating the requirement that the fire-resistance rating of structural members is to comply with "this section" and "Table 601".

714.1.1 – Existing section 714.2 is not necessary and contains no particular requirements which are not contained in Section 714.1. The text of Section 714.1.1 was revised to more closely resemble the current terminology in line 1 and footnote a of Table 601 which is "structural frame". The incorporation of "other structural members" in Section 714.1.1 is to place reliance on the function of the member to determine its inclusion in the primary structural frame although a laundry list of commonly understood members is retained for understanding of the intent. The structural members named in the existing laundry list are included in the subsections which apply to such members. It should be noted that this section, as does the current footnote, does not consider the lateral load resisting system as part of the structural frame within the context of fire resistance ratings.

714.1.2 – This text is based on the second sentence of existing Footnote a to Table 601.

714.2 – The proposal utilizes the text and concept contained in existing Section 714.2.1. The inclusion of "encasement" in the section title is to enhance the focus of the section's intent. The proposed deletion of "columns" from the laundry list is to eliminate the implication that columns are not required to be individually protected to their full height when protected by Section 711 - Horizontal Assemblies. Individual protection for columns is required by existing Section 714.2.2. This is addressed in proposed Section 714.4. The connections of these elements to other structural members are required to be protected for the continuity of protection.

714.2.1 – The proposal is based on the text in the second sentence of the existing Section 714.2.1 and is addressing those structural members which are not required to be individually protected according to proposed Section 714.2. The last sentence of existing Section 714.2.1 is not needed as proposed Section 714.4 exclusively deals with columns.

714.2.2 – The proposal requires columns to be individually protected for the full column length and columns are not permitted to be protected by membrane protection.

Bibliography:

Interim Report No. 1 of the CTC, Area of Study – Review of NIST WTC Recommendations, March 9, 2006.

National Institute of Standards and Technology. Final Report of the National Construction Safety Team on the Collapses of the World Trade Center Towers. United States Government Printing Office: Washington, D.C. September 2005.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: This helps to address a couple of concerns which were raised by the NIST report on issues related to the World Trade Center. This item was considered to help with the concerns that the structural frame be better defined and addressed so that the level of fire protection is easier to determine. Having these elements better defined helps to clarify the fire protection required for the structural frame and secondary members. It also helps to clarify that the floor is not considered as being a part of the structural frame. This proposal does not contain any technical changes to the requirements but appropriately moves the definition for structural frame from the table footnote into the proposed sections 714.1.1 and 714.1.2.

Assembly Action:

None

Final Hearing Results

FS98-06/07

AS

Code Change No: FS100-06/07

Original Proposal

Sections: 714.8 (New), 714.8.1 (New), 714.8.2 (New), 714.8.3 (New), 714.8.3.1 (New), 714.8.3.2 (New), 714.8.4 (New), 714.8.5 (New)

Proponent: William M. Connolly, State of New Jersey, Department of Community Affairs, Division of Codes and Standards, representing International Code Council Ad Hoc Committee on Terrorism Resistant Buildings

Add new text as follows:

714.8 Spray-Applied Fire Resistive Materials (SFRM). Spray-applied fire resistive materials shall comply with the 714.8.1 through 714.8.4.

714.8.1 Fire Resistance rating. The application of SFRM shall be consistent with its fire resistance rating listing including, but not limited to, minimum thickness and dry density of the applied SFRM, method of application, substrate surface conditions, the use of bonding adhesives, sealants and reinforcing or other materials.

714.8.2 Manufacturer's installation instruction. The application of SFRM shall be in accordance with the manufacturer's installation instruction. The instructions shall include, but are not limited to, substrate temperatures and surface conditions, and SFRM handling, storage, mixing, conveyance, method of application, curing and ventilation.

714.8.3 Substrate condition. The SFRM shall be applied to a substrate in compliance with 714.8.3.1 through 714.8.3.2.

714.8.3.1 Surface conditions. Substrates to receive SFRM shall be free of dirt, oil, grease, release agents, loose scale or paint, primers, paints and encapsulants other than those fire-tested and classified by a recognized testing agency, and any other condition that may prevent adequate adhesion. Primed, painted or encapsulated steel shall be allowed provided that testing has demonstrated that required adhesion is maintained.

714.8.3.2 Primers, Paints and Encapsulants. Where the SFRM is to be applied over primers, paints, or encapsulants other than those specified in the listing, the material shall be field tested in accordance with ASTM E 736. Where testing demonstrates that required adhesion is maintained, SFRM shall be permitted to be applied to primed, painted or encapsulated wide flange steel shapes in accordance with the following conditions:

1. The beam flange width does not exceed 12 in. (300 mm); or
2. The column flange width does not exceed 16 in. (400 mm); or
3. The beam or column web depth does not exceed 16 in. (400 mm).

4. The average and minimum bond strength values shall be determined based on a minimum of five bond tests conducted in accordance with ASTM E736. Bond tests conducted in accordance with ASTM E 736 indicate a minimum average bond strength of 80 percent and a minimum individual bond strength of 50 percent, when compared to the bond strength of the SFRM as applied to clean uncoated 1/8-in. (3-mm) thick steel plate.

714.8.4 Temperature. A minimum ambient and substrate temperature of 40°F (4.44°C) shall be maintained during and for a minimum of 24 hours after the application of the SFRM, unless the manufacturer's installation instructions allow otherwise.

714.8.5 Finished condition. The finished condition of SFRM applied to structural members or assemblies shall not, upon complete drying or curing, exhibit cracks, voids, spalls, delamination or any exposure of the substrate. Surface irregularities of spray-applied SFRM shall be deemed acceptable.

Reasons: This code change proposal is one of fourteen proposals being submitted by the International Code Council Ad Hoc Committee on Terrorism Resistant Buildings.

The purpose of this proposal is to increase the in-place durability of Spray Applied Fire Resistant Material (SFRM) by established code requirements for the application of the material. The Code currently lacks such provisions. The National Institute of Standards and Technology's (NIST) investigation of the World Trade Center (WTC) tragedy documented that the proximate cause of the actual collapse was the action of a building contents fire on light steel members in the absence of spray applied fire resistive material, which had been dislodged. Events far less dramatic than an airplane attack have been known to dislodge SFRM. Events as simple as an elevator movement, building sway or maintenance activities can dislodge SFRM if it is not adhered properly. Recommendation 6 of the NIST WTC Report calls for improvement of the in-place durability of SFRM. This proposal is one of three that seeks to achieve that objective. The other two are a proposal for a new Section 403.15 requiring higher bond strengths for SFRM in taller buildings, and a strengthened Section 1704.10 dealing with special inspections of SFRM installations. The proposed new Section 714.8 establishes for the first time in the Code specific requirements governing the application of SFRM.

Sections 714.8.1 and 714.8.2 require that application be in accordance with all terms and conditions of the listing and the manufacturer's instructions.

Section 714.8.3 deals with the very important issue of substrate. The in-place adhesion of SFRM can be reduced by a factor of 10 when applied over certain primers when compared to the adhesion obtained by the rated material applied on bare clean steel. The section specifies to a field test that must be performed to determine adhesion whenever the field substrate differs from that contemplated by the listing.

Section 714.8.4 specifies a minimum temperature for the application of SFRM.

Section 714.8.5 establishes requirements for the finished condition of SFRM.

These proposals are based upon existing industry guidelines that are presently being followed by many installers.

Bibliography:

Association of the Wall and Ceiling Industries International. Technical Manual 12-A: Standard Practice for the Testing and Inspection of Field Applied Sprayed Fire-resistive Materials; an Annotated Guide. Falls Church, Virginia: Association of the Wall and Ceiling Industries International. 1997, Third Edition.

National Institute of Standards and Technology. Final Report of the National Construction Safety Team on the Collapses of the World Trade Center Towers. United States Government Printing Office: Washington, D.C. September 2005.

Cost Impact: This proposal will not increase cost since these procedures are already being followed in responsible installations. This code text is needed to ensure that they are always followed.

Public Hearing Results

Committee Action:

Approved as Modified

Modify proposal as follows:

714.8 ~~Spray-Applied~~ Sprayed Fire Resistive Materials (SFRM). ~~Spray-applied~~ Sprayed fire resistive materials shall comply with the 714.8.1 through 714.8.4.

714.8.1 Fire Resistance Rating. The application of SFRM shall be consistent with its fire resistance rating listing including, but not limited to, minimum thickness and dry density of the applied SFRM, method of application, substrate surface conditions, the use of bonding adhesives, sealants and reinforcing or other materials.

714.8.2 Manufacturer's Installation Instruction. The application of SFRM shall be in accordance with the manufacturer's installation instruction. The instructions shall include, but are not limited to, substrate temperatures and surface conditions, and SFRM handling, storage, mixing, conveyance, method of application, curing and ventilation.

714.8.3 Substrate condition. The SFRM shall be applied to a substrate in compliance with 714.8.3.1 through 714.8.3.2.

714.8.3.1 Surface Conditions. Substrates to receive SFRM shall be free of dirt, oil, grease, release agents, loose scale or paint, primers, paints and encapsulants other than those fire-tested and classified by a recognized testing agency, and any other condition that ~~may prevent~~ adequate adhesion. Primed, painted or encapsulated steel shall be allowed provided that testing has demonstrated that required adhesion is maintained.

714.8.3.2 Primers, Paints and Encapsulants. Where the SFRM is to be applied over primers, paints, or encapsulants other than those specified in the listing, the material shall be field tested in accordance with ASTM E 736. Where testing of the SFRM with primers, paints or encapsulants demonstrates that required adhesion is maintained, SFRM shall be permitted to be applied to primed, painted or encapsulated wide flange steel shapes in accordance with the following conditions:

1. The beam flange width does not exceed 12 in. (300 mm); or
2. The column flange width does not exceed 16 in. (400 mm); or
3. The beam or column web depth does not exceed 16 in. (400 mm).
4. The average and minimum bond strength values shall be determined based on a minimum of five bond tests conducted in accordance with ASTM E736. Bond tests conducted in accordance with ASTM E 736 indicate a minimum average bond strength of 80 percent and a minimum individual bond strength of 50 percent, when compared to the bond strength of the SFRM as applied to clean uncoated 1/8-in. (3-mm) thick steel plate.

714.8.4 Temperature. A minimum ambient and substrate temperature of 40°F (4.44°C) shall be maintained during and for a minimum of 24 hours after the application of the SFRM, unless the manufacturer’s installation instructions allow otherwise.

714.8.5 Finished condition. The finished condition of SFRM applied to structural members or assemblies shall not, upon complete drying or curing, exhibit cracks, voids, spalls, delamination or any exposure of the substrate. Surface irregularities of ~~spray-applied~~ SFRM shall be deemed acceptable.

Committee Reason: This proposal provides enforceable language to assure compliance with the code requirements. This helps to address the NIST report issue that testing is to un-primed steel but the actual field installation is done to steel with primers and therefore the adhesion is often greatly different. This proposal puts important provisions in the code and not just in the standard where the inspector often does not see them. The testimony did clarify that the size limitations of Section 714.8.3.2 items 1, 2, and 3 do not limit the size of members which may use SFRM but instead only limit the size of members which use this section and apply them to materials which are “other than those specified in the listing.” The modifications help coordinate with changes made by FS156-06/07 regarding the term “sprayed” versus “spray-applied” and also included other changes which were believed to clarify the provisions and eliminate vague language.

Assembly Action:

None

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Philip Brazil, P.E., Reid Middleton, Inc., representing himself, requests Approval as Modified by this public comment.

Further modify proposal as follows:

714.8 Sprayed Fire ~~Resistive~~ Resistant Materials (SFRM). Sprayed fire ~~resistive resistant~~ materials (SFRM) shall comply with ~~the~~ Sections 714.8.1 through 714.8.4.

714.8.1 Fire Resistance Rating. The application of SFRM shall be consistent with ~~its~~ the fire resistance rating and the listing including, but not limited to, minimum thickness and dry density of the applied SFRM, method of application, substrate surface conditions; and the use of bonding adhesives, sealants, ~~and~~ reinforcing or other materials.

714.8.2 Manufacturer’s Installation Instruction. The application of SFRM shall be in accordance with the manufacturer’s installation instructions. The instructions shall include, but are not limited to, substrate temperatures and surface conditions, and SFRM handling, storage, mixing, conveyance, method of application, curing and ventilation.

714.8.3 Substrate condition. The SFRM shall be applied to a substrate in compliance with Sections 714.8.3.1 through 714.8.3.2.

714.8.3.1 Surface Conditions. Substrates to receive SFRM shall be free of dirt, oil, grease, release agents, loose scale ~~or paint and any other condition that prevents adhesion.~~ The substrates shall also be free of primers, paints and encapsulants other than those fire-tested and ~~classified listed~~ listed by a nationally recognized testing agency ~~and any other condition that prevents adhesion.~~ Primed, painted or encapsulated steel shall be allowed provided ~~that~~ testing has demonstrated that required adhesion is maintained.

714.8.3.2 Primers, Paints and Encapsulants. Where the SFRM is to be applied over primers, paints, or encapsulants other than those specified in the listing, the material shall be field tested in accordance with ASTM E 736. Where testing of the SFRM with primers, paints or encapsulants demonstrates that required adhesion is maintained, SFRM shall be permitted to be applied to primed, painted or encapsulated wide flange steel shapes in accordance with the following conditions:

1. The beam flange width does not exceed 12 in. (300 mm); or
2. The column flange width does not exceed 16 in. (400 mm); or
3. The beam or column web depth does not exceed 16 in. (400 mm).
4. The average and minimum bond strength values shall be determined based on a minimum of five bond tests conducted in accordance with ASTM E736. Bond tests conducted in accordance with ASTM E 736 shall indicate a minimum average bond strength of 80 percent and a minimum individual bond strength of 50 percent, when compared to the bond strength of the SFRM as applied to clean uncoated 1/8-in. (3-mm) thick steel plate.

714.8.4 Temperature. A minimum ambient and substrate temperature of 40°F (4.44°C) shall be maintained during and for a minimum of 24 hours after the application of the SFRM, unless the manufacturer’s installation instructions allow otherwise.

714.8.5 Finished condition. The finished condition of SFRM applied to structural members or assemblies shall not, upon complete drying or curing, exhibit cracks, voids, spalls, delamination or any exposure of the substrate. Surface irregularities of SFRM shall be deemed acceptable.

Commenter's Reason: The purpose for the public comment is to make the proposed language more technically sound. In Section 714.8, "sprayed fire resistive materials" is changed to "sprayed fire resistant materials" for consistency with use of the latter term elsewhere in the IBC. In Section 714.8.1, "its fire resistance rating" is changed to "the fire resistance rating" because sprayed fire resistant materials are typically not listed for fire resistance ratings but are components of fire-resistance-rated designs that include the structural member or element receiving the materials. In Section 714.8.3.1, "classified" is changed to "listed" for consistency with "listing" in Section 714.8.3.2. The first sentence of Section 714.8.3.1 is changed to two sentences to make it clear that listings by nationally recognized testing laboratories are applicable to primers, paints and encapsulants; but not to dirt, oil, grease, release agents and loose scale.

Final Hearing Results

FS100-06/07

AMPC1

Code Change No: FS101-06/07

Original Proposal

Section: 715.2

Proponent: William E. Koffel, P.E., Koffel Associates, Inc., representing Fire Rated Glazing Industry

Revise as follows:

715.2 Fire-resistance-rated glazing. ~~Labeled fire-resistance-rated glazing tested as part of a fire-resistance-rated wall assembly in accordance with ASTM E 119 and labeled in accordance with Section 706.2.1 shall be permitted in fire doors and fire window assemblies in accordance with their listings and shall not otherwise be required to comply with this section.~~

Reason: Currently the Code exempts fire resistance rated glazing from the requirements of Section 715 because such glazing should not be considered an opening since it has been tested and meets the performance requirements for a fire resistance rated wall assembly. However, the current Code provisions do not clearly indicate that such glazing should be permitted to be used wherever fire protection rated glazing is permitted. The purpose of this proposal is to make clear how fire resistance rated glazing used in fire doors and fire window assemblies should be labeled. Confusion could exist as to whether it should be labeled with a "W" in accordance with 706.2.1, or a "D" in accordance with 715.4.6.3.1, or an "OH" in accordance with 715.5.8.1. The proposed revision makes it clear that fire resistance rated glazing is to be labeled "W" wherever it is used, including fire doors and fire window assemblies.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: This helps to clarify existing code labeling issues. This makes the current marking provisions clearer. This does accept the higher rated fire-resistance-rated glazing versus the fire-protection-rated glazing in both doors and windows. This proposal will work regardless of the labeling provisions which may be adopted later (FS103-06/07).

Analysis: The reference to Section 706.2.1 may be revised depending on the final result of FS36-06/07. If FS36-06/07 is approved, the reference will be changed to Section 703.5.

Assembly Action:

None

Final Hearing Results

FS101-06/07

AS

Code Change No: **FS102-06/07**

Original Proposal

Sections: 715.3, 715.4.3.2, 715.5, 715.5.1, 715.5.2, 715.5.8.1, Chapter 35 (New)

Proponent: Bob Eugene/ Underwriters Laboratories Inc.

1. Revise as follows:

715.3 Alternative methods for determining fire protection ratings. The application of any of the alternative methods listed in this section shall be based on the fire exposure and acceptance criteria specified in NFPA 252, ~~or NFPA 257~~ or UL 9. The required fire resistance of an opening protective shall be permitted to be established by any of the following methods or procedures:

1. Designs documented in approved sources.
2. Calculations performed in an approved manner.
3. Engineering analysis based on a comparison of opening protective designs having fire-protection ratings as determined by the test procedures set forth in NFPA 252, ~~or NFPA 257~~ or UL 9.
4. Alternative protection methods as allowed by Section 104.11.

715.4.3.2 Glazing in door assemblies. In a 20-minute fire door assembly, the glazing material in the door itself shall have a minimum fire-protection rating of 20 minutes and shall be exempt from the hose stream test. Glazing material in any other part of the door assembly, including transom lites and sidelites, shall be tested in accordance with NFPA 257 or UL 9, including the hose stream test, in accordance with Section 715.5.

715.5 Fire-protection-rated glazing. Glazing in fire window assemblies shall be fire-protection rated in accordance with this section and Table 715.5. Glazing in fire door assemblies shall comply with Section 715.4.6. Fire-protection-rated glazing shall be tested in accordance with and shall meet the acceptance criteria of NFPA 257 or UL 9. Fire-protection-rated glazing shall also comply with NFPA 80. Openings in nonfire-resistance-rated exterior wall assemblies that require protection in accordance with Section 704.3, 704.8, 704.9 or 704.10 shall have a fire-protection rating of not less than 3/4 hour.

Exceptions:

1. Wired glass in accordance with Section 715.5.3.
2. Fire-protection-rated glazing in 0.5-hour fire-resistance-rated partitions is permitted to have an 0.33-hour fire-protection rating.

715.5.1 Testing under positive pressure. NFPA 257 or UL 9 shall evaluate fire-protection-rated glazing under positive pressure. Within the first 10 minutes of a test, the pressure in the furnace shall be adjusted so at least two-thirds of the test specimen is above the neutral pressure plane, and the neutral pressure plane shall be maintained at that height for the balance of the test.

715.5.2 Nonsymmetrical glazing systems. Nonsymmetrical fire-protection-rated glazing systems in fire partitions, fire barriers or in exterior walls with a fire separation distance of 5 feet (1524 mm) or less pursuant to Section 704 shall be tested with both faces exposed to the furnace, and the assigned fire protection rating shall be the shortest duration obtained from the two tests conducted in compliance with NFPA 257 or UL 9.

715.5.8.1 Identification. For fire-protection-rated glazing, the label shall bear the following two-part identification: "OH – XXX." "OH" indicates that the glazing meets both the fire-resistance and the hose-stream requirements of NFPA 257 or UL 9 and is permitted to be used in openings. "XXX" represents the fire-protection rating period, in minutes, that was tested.

2. Add standard to Chapter 35 as follows:

UL

9-2000 Fire Tests of Window Assemblies, with Revisions through April 2005

Reason: The purpose of this code change is to include reference to UL 9 as an alternate to NFPA 257 which is currently referenced in these code sections. These two Standards describe the same test method. The specifications for the test apparatus and test procedure are identical between the two standards. As such, identical test results would be obtained from tests conducted using each of these methods.

UL 9 is an ANSI approved standard. The inclusion of this alternate test method would provide the authority having jurisdiction with the flexibility to accept listed and labeled products evaluated in accordance with NFPA 257 or UL 9.

Cost Impact: The code change proposal will not increase cost of construction.

Public Hearing Results

Note: The following analysis was not in the Code Change Proposal book but was published in the AErrata to the 2006/2007 Proposed Changes to the International Codes and Analysis of Proposed Referenced Standards® provided at the code development hearings:

Analysis: Review of proposed new standard indicated that, in the opinion of staff, the standard did comply with ICC standards criteria

Committee Action:

Approved as Submitted

Committee Reason: This action is consistent with the committee's action on similar proposals. This provides added flexibility by including a UL standard which is commonly used. The UL test standard also contains a positive pressure test which the committee felt is appropriate for the test standard.

Assembly Action:

None

Final Hearing Results

FS102-06/07

AS

Code Change No: FS105-06/07

Original Proposal

Sections: 715.4.1, 715.4.2, 715.4.4, 715.4.4.1

Proponent: Philip Brazil, P.E., Reid Middleton, Inc., representing himself

Revise as follows:

715.4.1 Side-hinged or pivoted swinging doors. Fire door assemblies with side-hinged and pivoted swinging doors shall be tested in accordance with NFPA 252 or UL 10C. After 5 minutes into the NFPA 252 test, the neutral pressure level in the furnace shall be established at 40 inches (1016 mm) or less above the sill.

715.4.2 Other types of doors. Fire door assemblies with other types of doors, including swinging elevator doors and fire shutter assemblies, shall be tested in accordance with NFPA 252 or UL 10B. The pressure in the furnace shall be maintained as nearly equal to the atmospheric pressure as possible. Once established, the pressure shall be maintained during the entire test period.

715.4.4 Doors in exit enclosures and exit passageways. Fire door assemblies in exit enclosures and exit passageways shall have a maximum transmitted temperature end point of not more than 450°F (250°C) above ambient at the end of 30 minutes of standard fire test exposure.

Exception: The maximum transmitted temperature rise is not limited in buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2.

715.4.4.1 Glazing in doors. Fire-protection-rated glazing in excess of 100 square inches (0.065 m²) shall be permitted in fire door assemblies when tested in accordance with NFPA 252 as components of the door assemblies and not as glass lights, and shall have a maximum transmitted temperature rise of 450°F (250°C) in accordance with Section 715.4.4.

Exception: The maximum transmitted temperature end point is not required in buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2.

CODE CHANGES RESOURCE COLLECTION – INTERNATIONAL BUILDING CODE

Reason: The revisions to Section 715.4.1 and 715.4.2 are intended to make their terminology consistent with the charging statement in Section 715.4, which refers to fire door and fire shutter assemblies. The revision to Section 715.4.4.1 is intended to permit the installation of fire-protection-rated glazing greater than 100 square inches in area when determined by tests conducted in accordance with UL 10B, UL 10C or NFPA 252, as applicable. The current language would only permit the installation when established by NFPA 252 tests. The choice of test standard is governed by the applicable requirements in Section 715.4.1 or 715.4.2.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: This helps clarify the intent of Section 715.4 by using similar terminology in Sections 715.4.1 and 715.4.2. The change to Section 715.4.4.1 will provide additional options to accept glazing which has been tested under several test standards instead of simply the one which is currently listed. The title to Section 715.4.2 may need to be modified since it does include fire shutters within this section. If FS105 is approved at the final action hearings, this change in title would be made editorially by the staff.

Assembly Action:

None

Final Hearing Results

FS105-06/07

AS

Code Change No: FS106-06/07

Original Proposal

Section: 715.4.3.1

Proponent: Bob Eugene, Underwriters Laboratories Inc.

Revise as follows:

715.4.3.1 Smoke and draft control. Fire door assemblies shall also meet the requirements for a smoke and draft control door assembly tested in accordance with UL 1784. The air leakage rate of the door assembly shall not exceed 3.0 cubic feet per minute per square foot ($0.01524 \text{ m}^3/\text{s} \cdot \text{m}^2$) of door opening at 0.10 inch (24.9 Pa) of water for both the ambient temperature and elevated temperature tests. Louvers shall be prohibited. Installation of smoke doors shall be in accordance with NFPA 105.

Reason: To add criteria for smoke and draft control doors consistent with doors in smoke partitions. With the reformatting of these provisions in the last code cycle, the leakage ratings were removed. As the code is currently drafted, the leakage criteria for smoke barriers are not clear. This change provides consistency with NFPA 105.

Cost Impact: The code change proposal will not increase cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The 0.10 inch water column pressure level is adequate for conducting this test. While the test standard does include higher pressure levels, this level is adequate to demonstrate compliance and it does coordinate with the door testing. This does help clarify and bring back this issue which was taken out in the previous code because it was confusing. This language eliminates the confusion.

Assembly Action:

None

Final Hearing Results

FS106-06/07

AS

Code Change No: FS108-06/07

Original Proposal

Sections: 715.4.4, 715.4.4.1

Proponent: William F. O’Keeffe, SAFTI FIRST

Revise as follows:

715.4.4 Doors in exit enclosures and exit passageways. Fire door assemblies in exit enclosures and exit passageways shall have a maximum transmitted temperature end point of not more than 450°F (250°C) above ambient at the end of 30 minutes of standard fire test exposure.

Exception: The maximum transmitted temperature rise is not ~~limited~~ required in buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2.

715.4.4.1 Glazing in doors. Fire-protection-rated glazing in excess of 100 square inches (0.065 m²) shall be permitted in fire door assemblies when tested in accordance with NFPA 252 as components of the door assemblies and not as glass lights, and shall have a maximum transmitted temperature rise of 450°F (250°C) in accordance with Section 715.4.4.

Exception: The maximum transmitted temperature ~~end point~~ rise is not required in buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2.

Reason: Clarify the code for consistency between the exceptions in 715.4.4 and 715.4.4.1

The current code wording is inconsistent in the use of the terms “end point” and “rise”, and the words “limited” and “required”

The term “rise” was added to the exception in 715.4.4 during the last code cycle. To be consistent with the last code cycle, the term “rise” should also replace “end point” in the exception in 715.4.4.1. Likewise, the terms “limited” and “required” should both be the same for consistency. The term “required” is more definitive and clear than the term “limited”. With these changes, both exceptions would be consistent.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: As stated in the proponent-s reason statement, this will provide consistency between multiple code sections.

Assembly Action:

None

Final Hearing Results

FS108-06/07

AS

Code Change No: **FS110-06/07**

Original Proposal

Section: 715.4.5.1

Proponent: Thomas R. Janicak, Ceco Door Products, An ASSA ABLOY Door Group Company, representing Steel Door Institute

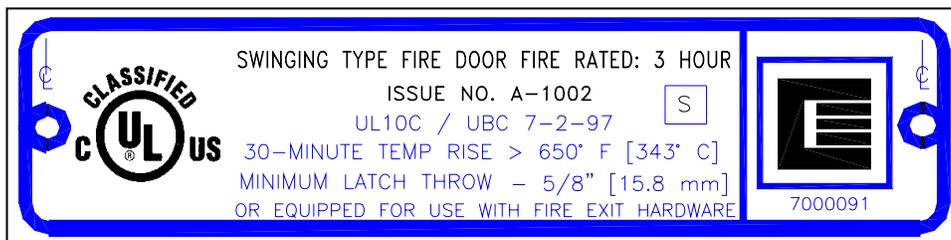
Revise as follows:

715.4.5.1 Fire door labeling requirements. Fire doors shall be labeled showing the name of the manufacturer or other identification readily traceable back to the manufacturer, the name or logo of the third-party inspection agency, the fire protection rating and, where required for fire doors in exit enclosures and exit passageways by Section 715.4.4, the maximum transmitted temperature end point. Smoke and draft control doors complying with UL 1784 shall be labeled as such and shall also comply with Section 715.4.5.3. Labels shall be approved and permanently affixed. The label shall be applied at the factory or location where fabrication and assembly are performed.

Reason: As written, Section 715.3.5 does not accurately define what is the standard labeling practice employed by fire door manufactures. To bring the code in line with the labeling methods currently authorized by Underwriters Laboratories and Intertek Testing services (Warnock Hersey).

1. In lieu of the company name, the use of a corporate logo has been a standard practice employed by manufacturers. A listing of these logos can be found at the rear of the Underwriters Laboratories Fire Resistance Directory.
2. Both UL and ITS provide what is termed a standard or stock label. These labels are generic in nature and do not include the name of the manufacturer producing the fire door. Smaller companies who do not have their own combination type labels printed and inventoried typically use them. What is required by the certification agencies when these labels are used is as follows:
 - a. Underwriters Laboratories requires that the fire door manufacturer engrave or stamp into the label either its Follow-Up service Procedure Number or Company name. In most cases, the file number will be entered. A building official would find these file numbers cross-referenced to the manufacturer on the UL website or by calling UL directly for the information.
 - b. Intertek Testing Services (Warnock Hersey) labels are traceable back to the fire door manufacturer by means of a serial number.

Below is a typical UL label currently being used by Ceco Door Products. You will note that logos for both the manufacturer and inspection agencies are used in lieu of the names.



Another issue of concern is a statement in the code that says: "Smoke and draft control doors complying with UL 1784 shall be labeled as such." You will note on the label on the label that the letter "S" appears in a box. This is a shorthand method of indicating compliance to that requirement. This needs to be reflected in the code.

Cost Impact: The code change proposal will not increase the cost of construction. Small fire door manufacturers and labeling distribution will see a cost reduction.

Public Hearing Results

Committee Action:

Approved as Modified

Modify the proposal as follows:

715.4.5.1 Fire door labeling requirements. Fire doors shall be labeled showing the name of the manufacturer or other identification readily traceable back to the manufacturer, the name or logo trademark of the third-party inspection agency, the fire protection rating and, where required for fire doors in exit enclosures and exit passageways by Section 715.4.4, the maximum transmitted temperature end point. Smoke and draft control doors complying with UL 1784 shall be labeled as such and shall also comply with Section 715.4.5.3. Labels shall be approved and permanently affixed. The label shall be applied at the factory or location where fabrication and assembly are performed.

Committee Reason: As stated in the proponent-s reason statement, this does coordinate with the current labeling practices. UL does accept either the inclusion of the company-s name or trademark. These trademarks are recorded and traceable should there be questions years from now when these labels are encountered by an inspector in the field.

Assembly Action:

None

Final Hearing Results

FS110-06/07

AM

Code Change No: **FS112-06/07**

Original Proposal

Section 715.4.6.1

Proponent: William F. O'Keeffe, SAFTI FIRST

Revise as follows:

715.4.6.1 Size limitations. Wired glass used in fire doors shall comply with Table 715.5.3. Other fire-protection-rated glazing shall comply with the size limitations of NFPA 80.

Exceptions:

1. Fire-protection-rated glazing ~~in fire doors~~ located in fire walls shall be prohibited except ~~that where serving~~ as where serving in a fire door in a horizontal exit, a self-closing swinging door shall be permitted to have a vision panel of not more than 100 square inches (0.065 m²) without a dimension exceeding 10 inches (254 mm).
2. Fire-protection-rated glazing shall not be installed in fire doors having a 1½-hour fire protection rating intended for installation in fire barriers, unless the glazing is not more than 100 square inches (0.065 m²) in area.

Reason: Clarify the code. This code change will clearly state that fire protective glazing is prohibited in fire walls with the exception of the use in vision panels limited to 100 square inches in doors.

This proposal is editorial and suggests wording to clarify the code.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: This proposal does provide a better flow of the language and is a good clarification. The committee agrees that this is simply an editorial change and does not affect the application of the requirements.

Assembly Action:

None

Final Hearing Results

FS112-06/07

AS

Code Change No: FS113-06/07

Original Proposal

Sections: 715.4.6.1, 715.5, 715.5.3, Table 715.5.3, 715.5.4

Proponent: William F. O’Keeffe, SAFTI FIRST

1. Revise as follows:

715.4.6.1 Size limitations. ~~Wired glass~~ Fire-protective-rated glazing used in fire doors shall ~~comply with Table 715.5.3.~~ Other fire-protection-rated glazing shall comply with the size limitations of NFPA 80.

Exceptions:

1. Fire-protection-rated glazing in fire doors located in fire walls shall be prohibited except that where serving as a horizontal exit, a self-closing swinging door shall be permitted to have a vision panel of not more than 100 square inches (0.065 m²) without a dimension exceeding 10 inches (254 mm).
2. Fire-protection-rated glazing shall not be installed in fire doors having a 1 1/2-hour fire protection rating intended for installation in fire barriers, unless the glazing is not more than 100 square inches (0.065 m²) in area.

715.5 Fire-protection-rated glazing. Glazing in fire window assemblies shall be fire-protection rated in accordance with this section and Table 715.5. Glazing in fire door assemblies shall comply with Section 715.4.6. Fire-protection-rated glazing shall be tested in accordance with and shall meet the acceptance criteria of NFPA 257. Fire-protection-rated glazing shall also comply with NFPA 80. Openings in nonfire-resistance-rated exterior wall assemblies that require protection in accordance with Section 704.3, 704.8, 704.9 or 704.10 shall have a fire-protection rating of not less than ¾ hour.

Exceptions:

- ~~1. Wired glass in accordance with Section 715.5.3.~~
2. Fire-protection-rated glazing in 0.5-hour fire-resistance-rated partitions is permitted to have an 0.33-hour fire protection rating.

2. Delete without substitution as follows:

715.5.3 Wired glass. Steel window frame assemblies of 0.125-inch (3.2 mm) minimum solid section or of not less than nominal 0.048-inch thick (1.2 mm) formed sheet steel members fabricated by pressing, mitring, riveting, interlocking or welding and having provision for glazing with 1/4-inch (6.4 mm) wired glass where securely installed in the building construction and glazed with 1/4-inch (6.4 mm) labeled wired glass shall be deemed to meet the requirements for a 3/4-hour fire window assembly. ~~Wired glass panels shall conform to the size limitations set forth in Table 715.5.3.~~

**TABLE 715.5.3
LIMITING SIZES OF WIRED GLASS PANELS**

OPENING FIRE PROTECTION RATING	MAXIMUM AREA (square inches)	MAXIMUM HEIGHT (inches)	MAXIMUM WIDTH (inches)
3 hours	0	0	0
1 1/2-hour doors in exterior walls	0	0	0
1 and 1 1/2 hours	100	33	40
3/4 hour	1,296	54	54
20 minutes	Not Limited	Not Limited	Not Limited
Fire window Assemblies	1,296	54	54

For SI: 1 inch = 25.4 mm, 1 square inch = 645.2 mm².

715.5.4 Nonwired glass. ~~Glazing other than wired glass in fire window assemblies shall be fire-protection-rated glazing installed in accordance with and complying with the size limitations set forth in NFPA 80.~~

Reason: Delete current requirements. Wired glass should be designated as fire-protection-rated glazing to be consistent with how other types of glazing products are described.

Wired glass does not meet the safety glazing requirements in 715.4.6.4 and would normally not be eligible for use in all fire rated door assemblies and fire window assemblies in areas subject to human impact. The use of wired glass and the qualifications for use was permitted and specified in the code for fire rated applications because it was exempt from the safety glazing requirements of Section 2406 by the Federal Government and it needed to be specifically referenced in the code as an exemption. When wired glass loses this exemption for complying with Chapter 24, Section 2406, the need to have specific requirements covering this specific type of glazing is no longer needed. Describing a specific type of fire-protection-rated glazing without including all other types of fire-protection-rated glazing in similar detail creates a business advantage for the wired glass product by being specifically mentioned in the code. All glazing products are described as fire-protection-rated glazing and shall comply with NFPA 80 per 715.4.6.1 and 715.5. Wired glass should be included as fire-protection-rated glazing to be consistent and fair. The paragraphs and tables referencing wired glass should be deleted at this time to eliminate the marketing and business advantage created by reference in the code.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Modified

Modify proposal as follows:

715.4.6.1 Size limitations. ~~Fire-protective~~ fire-protection-rated glazing used in fire doors shall comply with the size limitations of NFPA 80.

Exceptions:

1. Fire-protection-rated glazing in fire doors located in fire walls shall be prohibited except that where serving as a horizontal exit, a self-closing swinging door shall be permitted to have a vision panel of not more than 100 square inches (0.065 m²) without a dimension exceeding 10 inches (254 mm).
2. Fire-protection-rated glazing shall not be installed in fire doors having a 1 1/2-hour fire protection rating intended for installation in fire barriers, unless the glazing is not more than 100 square inches (0.065 m²) in area.

715.5 Fire-protection-rated glazing. Glazing in fire window assemblies shall be fire-protection rated in accordance with this section and Table 715.5. Glazing in fire door assemblies shall comply with Section 715.4.6. Fire-protection-rated glazing shall be tested in accordance with and shall meet the acceptance criteria of NFPA 257. Fire-protection-rated glazing shall also comply with NFPA 80. Openings in nonfire-resistance-rated exterior wall assemblies that require protection in accordance with Section 704.3, 704.8, 704.9 or 704.10 shall have a fire-protection rating of not less than 3/4 hour.

Exceptions:

1. Wired glass in accordance with Section 715.5.3.
2. Fire-protection-rated glazing in 0.5-hour fire-resistance-rated partitions is permitted to have an 0.33-hour fire protection rating.

715.5.3 Wired glass. Steel window frame assemblies of 0.125-inch (3.2 mm) minimum solid section or of not less than nominal 0.048-inch-thick (1.2 mm) formed sheet steel members fabricated by pressing, mitering, riveting, interlocking or welding and having provision for glazing with 1/4-inch (6.4 mm) wired glass where securely installed in the building construction and glazed with 1/4-inch (6.4 mm) labeled wired glass shall be deemed to meet the requirements for a 3/4-hour fire window assembly. Wired glass panels shall conform to the size limitations set forth in Table 715.5.3.

**TABLE 715.5.3
LIMITING SIZES OF WIRED GLASS PANELS**

OPENING FIRE PROTECTION RATING	MAXIMUM AREA (square inches)	MAXIMUM HEIGHT (inches)	MAXIMUM WIDTH (inches)
3 hours	0	0	0
1 1/2-hour doors in exterior walls	0	0	0
1 and 1 1/2 hours	100	33	10
3/4 hour	1,296	54	54
20 minutes	Not Limited	Not Limited	Not Limited
Fire window Assemblies	1,296	54	54

For SI: 1 inch = 25.4 mm, 1 square inch = 645.2 mm².

715.5.4 Nonwired glass. Glazing other than wired glass in fire window assemblies shall be fire-protection-rated glazing installed in accordance with and complying with the size limitations set forth in NFPA 80.

Committee Reason: Wired glass is no longer permitted as a safety glazing in hazardous locations. Therefore Section 715.4.6.1 should not include wired glass since it may not be used in the doors which are considered as a hazardous location. Additionally, the code should not be product specific but should address the required performance. The committee modified the proposal to keep Section 715.5 exception 1 and also keep all of the text which was proposed to be deleted in item 2 of this proposal. The modification recognizes that the code has historically accepted wired-glass in a steel frame as equivalent to a 3/4-hour assembly. The deletion of this section and table would require a listed frame

which would increase the cost of construction without justification supporting such a change. The listing of wired-glass assemblies use the steel frames specified in this section during their testing. These prescriptive steel frame products have worked well historically and the option of using this should remain in the code. The change to “fire-protection” instead of “fire-protective” in Section 715.4.6.1 is an editorial change and not a modification by the committee. This aspect of the change was discussed during the hearings and ruled to be editorial.

Assembly Action:

None

Final Hearing Results

FS113-06/07

AM

Code Change No: FS116-06/07

Original Proposal

Section: 715.4.6.3.1

Proponent: William E. Koffel, P.E., Koffel Associates, Inc., representing Fire Rated Glazing Industry

Revise as follows:

715.4.6.3.1 Identification. For fire-protection-rated glazing, the label shall bear the following four-part identification: “D – H or NH – T or NT – XXX.” “D” indicates that the glazing shall be used in fire door assemblies and that the glazing meets the fire ~~resistance~~ protection requirements of the test standard NFPA 252. “H” shall indicate that the glazing meets the hose stream requirements of the test standard. “NH” shall indicate that the glazing does not meet the hose stream requirements of the test. “T” shall indicate that the glazing meets the temperature requirements of Section 715.4.4.1. “NT” shall indicate that the glazing does not meet the temperature requirements of Section 715.4.4.1. The placeholder “XXX” shall specify the fire-protection-rating period, in minutes.

Reason: The proposal improves the current code text in two ways. First, the current Code text refers to “the test standard” without specifying what test standard. As a comparison, the other identification sections (706.2.1 and 715.5.8.1) both specifically identify the test standard. Secondly, the current text incorrectly refers to the performance of such glazing as having a fire resistance performance when in fact it is a fire protection rating.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Modified

Modify proposal as follows:

715.4.6.3.1 Identification. For fire-protection-rated glazing, the label shall bear the following four-part identification: AD B H or NH B T or NT B XXX.® AD® indicates that the glazing shall be used in fire door assemblies and that the glazing meets the fire protection requirements of NFPA 252. AH® shall indicate that the glazing meets the hose stream requirements of the test standard NFPA 252. ANH® shall indicate that the glazing does not meet the hose stream requirements of the test. AT® shall indicate that the glazing meets the temperature requirements of Section 715.4.4.1. ANT® shall indicate that the glazing does not meet the temperature requirements of Section 715.4.4.1. The placeholder AXXX® shall specify the fire-protection-rating period, in minutes.

Committee Reason: The direct reference to the NFPA 252 standard provides a specific reference which is easy to follow and clear. The revision to fire Aprotection® is correct and is justified. There is a difference between fire-resistance and fire-protection and the terms should be used correctly.

Assembly Action:

None

Final Hearing Results

FS116-06/07

AM

Code Change No: FS118-06/07

Original Proposal

Sections: 715.4.6.4, 715.5.3 (New)

Proponent: William E. Koffel, P.E., Koffel Associates, Inc., representing Fire Rated Glazing Industry

1. Revise as follows:

715.4.6.4 Safety glazing. Fire-protection-rated glazing installed in fire doors ~~or fire window assemblies~~ in areas subject to human impact in hazardous locations shall comply with Chapter 24.

2. Add new text as follows:

715.5.3 Safety glazing. Fire-protection-rated glazing installed in fire window assemblies in areas subject to human impact in hazardous locations shall comply with Chapter 24.

(Renumber subsequent sections)

Reason: Section 715.4.6 applies to glazing in fire door assemblies and therefore the requirement for safety glazing in fire window assemblies in incorrectly included in Section 715.4.6.4. The proposal retains the requirement but adds a new section in the fire window section (715.5) to reference the appropriate safety glazing requirements.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: This proposal moves the requirement to a more appropriate section. This requirement for fire windows is difficult to find where it currently exists because the section it is currently in is applicable to doors.

Assembly Action:

None

Final Hearing Results

FS118-06/07

AS

Code Change No: FS124-06/07

Original Proposal

Table 715.5

Proponent: William E. Koffel, P.E., Koffel Associates, Inc., representing Fire Rated Glazing Industry

Revise table as follows:

**TABLE 715.5
FIRE WINDOW ASSEMBLY FIRE PROTECTION RATINGS**

TYPE OF ASSEMBLY	REQUIRED ASSEMBLY RATING (hours)	MINIMUM FIRE WINDOW ASSEMBLY RATING (hours)
Interior walls: Fire walls Fire barriers Smoke barriers and Fire partitions — <u>Fire partitions</u>	All > 1 1 1 <u>1/2</u>	NPa NPa $\frac{3}{4}$ $\frac{3}{4}$ <u>$\frac{1}{3}$</u>
Exterior walls	> 1 1	$1\frac{1}{2}$ $\frac{3}{4}$
Party wall	All	NP

NP = Not Permitted.

a. Not permitted except as specified in Section 715.2.

Reason: Although Exception No. 2 to Section 715.5 states the requirement for fire protection rated glazing in fire partitions having a fire resistance rating of ½ hour, Table 715.5 is silent for such fire partitions. The proposal merely makes the Table consistent with the requirements in the exception.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: This change will coordinate with the requirements of the code which permit 1/2-hour fire partitions and will provide the rating required for the windows. This will help clarify an issue which is currently not addressed within the code but which does arise due to the available rating of the fire partition.

Assembly Action:

None

Final Hearing Results

FS124-06/07

AS

Code Change No: FS129-06/07

Original Proposal

Section: 715.5.8.1

Proponent: William E. Koffel, P.E., Koffel Associates, Inc., representing Fire Rated Glazing Industry

Revise as follows:

715.5.8.1 Identification. For fire-protection-rated glazing, the label shall bear the following two-part identification: "OH – XXX." "OH" indicates that the glazing meets both the fire-resistance protection and the hose-stream requirements of NFPA 257 and is permitted to be used in openings. "XXX" represents the fire-protection rating period, in minutes, that was tested.

Reason: The current text incorrectly refers to the performance of such glazing as having a fire resistance performance when in fact it is a fire protection rating.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:**Approved as Submitted**

Committee Reason: This corrects the terminology so that it uses the correct phrase and coordinates with the first portion of the paragraph that states it is for fire-protection rated glazing. These items do have a fire-protection rating and not a fire-resistance rating. This also coordinates with the action taken on FS116 to correct the terminology.

Assembly Action:**None**

Final Hearing Results

FS129-06/07

AS

Code Change No: FS130-06/07

Original Proposal

Sections: 716.3.2.1 (IMC 607.3.2.1)

Proponent: Vickie Lovell, Delray, FL, representing Air Movement and Control Association

Revise as follows:

716.3.2.1 (IMC 607.3.2.1) Smoke damper actuation methods. The smoke damper shall close upon actuation of a listed smoke detector or detectors installed in accordance with Section 907.10 and one of the following methods, as applicable:

1. Where a damper is installed within a duct, a smoke detector shall be installed in the duct within 5 feet (1524 mm) of the damper with no air outlets or inlets between the detector and the damper. The detector shall be listed for the air velocity, temperature and humidity anticipated at the point where it is installed. Other than in mechanical smoke control systems, dampers shall be closed upon fan shutdown where local smoke detectors require a minimum velocity to operate.

2. Where a damper is installed above smoke barrier doors in a smoke barrier, a spot-type detector listed for releasing service shall be installed on either side of the smoke barrier door opening.
3. Where a damper is installed within an ~~unducted~~ air transfer opening in a wall, a spot-type detector listed for releasing service shall be installed within 5 feet (1524 mm) horizontally of the damper.
4. Where a damper is installed in a corridor wall or ceiling, the damper shall be permitted to be controlled by a smoke detection system installed in the corridor.
5. Where a total-coverage smoke detector system is provided within areas served by a heating, ventilation and air-conditioning (HVAC) system, dampers shall be permitted to be controlled by the smoke detection system.

Reason: This is the only section in the 2006 IBC where the term “unducted opening” is used. It is presumed that this applies to a hole in the wall, and the more appropriate term is air transfer opening.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: It is better to use the term Air transfer opening since it is the typically used term in the code instead of the term Aunducted opening.

Analysis: A similar revision will also be made in Section 607.5.4.1 of the International Mechanical Code because it is using the same wording. This section was discussed during the committee discussion and because the section is under the control of this committee and is identical, it will be modified accordingly.

Assembly Action:

None

Final Hearing Results

FS130-06/07

AS

Code Change No: FS135-06/07

Original Proposal

Sections: 716.5.3 (IMC 607.5.5)

Proponent: Michael Perrino, Code Consultants, Inc

Revise as follows:

716.5.3 (IMC 607.5.5) Shaft enclosures. Shaft enclosures that are permitted to be penetrated by ducts and air transfer openings shall be protected with approved fire and smoke dampers installed in accordance with their listing.

Exceptions:

1. Fire dampers are not required at penetrations of shafts where:
 - 1.1. Steel exhaust subducts are extended at least 22 inches (559 mm) vertically in exhaust shafts, provided there is a continuous airflow upward to the outside; or
 - 1.2. Penetrations are tested in accordance with ASTM E119 as part of the rated assembly; or
 - 1.3. Ducts are used as part of an approved smoke control system designed and installed in accordance with Section 909 and where the fire damper will interfere with the operation of the smoke control system; or
 - 1.4. The penetrations are in parking garage exhaust or supply shafts that are separated from other building shafts by not less than 2-hour fire-resistance-rated construction.

2. In Group B and R occupancies, equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1, smoke dampers are not required at penetrations of shafts where:
 - 2.1. ~~Kitchen, clothes dryer, b~~ Bathroom and toilet room exhaust openings are installed with steel exhaust subducts, having a wall thickness of at least 0.019 inch (0.48 mm); and
 - 2.2. That extend at least 22 inches (559 mm) vertically; and
 - 2.3. An exhaust fan is installed at the upper terminus of the shaft that is, powered continuously in accordance with the provisions of Section 909.11, so as to maintain a continuous upward airflow to the outside.
3. Smoke dampers are not required at penetration of exhaust or supply shafts in parking garages that are separated from other building shafts by not less than 2-hour fire-resistance-rated construction.
4. Smoke dampers are not required at penetrations of shafts where ducts are used as part of an approved mechanical smoke control system designed in accordance with Section 909 and where the smoke damper will interfere with the operation of the smoke control system.
5. Fire dampers and combination fire/smoke dampers are not required in kitchen and clothes dryer exhaust system when installed in accordance with the *International Mechanical Code*.

Reason: (In regards to the IBC): To coordinate with IMC Sections 504.2 (last sentence) and with my proposed revision to the last sentence of IMC Section 506.3.10.

The IMC addresses protection for specific equipment and such protection should not be regulated by occupancy classification.

Sections 506.3.10 as proposed for change and 504.2 of the International Mechanical Code adequately address the materials, protection and installation of grease ducts and clothes dryer exhaust ducts based on the hazards associated with such systems. There is no reason to require additional occupancy specific protection to systems which function the same in any occupancy. The new exception adds the necessary information so that the reader is directed to the proper code requirements.

(In regards to the IMC): To coordinate with Section 506.3.10 last sentence (per the proposed code change) and Section 504.2 last sentence.

The last sentence of current section 506.3.10, Grease duct enclosure, provides duct enclosure requirements which states "The duct enclosure shall serve a single grease exhaust duct system and shall not contain any other ducts, piping, wiring, or systems."

The proposed code change to Section 607.5.5, Exception 2 is meant to coordinate with our companion change to Section 506.3.10, which will state "The duct enclosure shall serve a single grease exhaust duct system and shall not contain any other ducts, piping, wiring, fire dampers, combination fire/smoke dampers and any similar devices that will obstruct the exhaust flow."

Also the last sentence of current Section 504.2, Exhaust penetrations, states "Fire dampers, combination fire/smoke dampers and any similar devices that will obstruct the exhaust flow, shall be prohibited in clothes dryer exhaust ducts."

The provisions in Sections 506.3.10 and 504.2 are provided for the specific equipment and should not be regulated by occupancy classification.

Sections 506.3.10 as proposed for change and 504.2 of the International Mechanical Code adequately address the materials, protection and installation of grease ducts and clothes dryer exhaust ducts based on the hazards associated with such systems. There is no reason to require additional occupancy specific protection to systems which function the same in any occupancy.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Modified

Replace original proposal with the following:

716.5.3 (IMC 607.5.5) Shaft enclosures. Shaft enclosures that are permitted to be penetrated by ducts and air transfer openings shall be protected with approved fire and smoke dampers installed in accordance with their listing.

Exceptions:

1. Fire dampers are not required at penetrations of shafts where:
 - 1.1. Steel exhaust subducts are extended at least 22 inches (559 mm) vertically in exhaust shafts, provided there is a continuous airflow upward to the outside; or
 - 1.2. Penetrations are tested in accordance with ASTM E119 as part of the rated assembly; or
 - 1.3. Ducts are used as part of an approved smoke control system designed and installed in accordance with Section 909 and where the fire damper will interfere with the operation of the smoke control system; or
 - 1.4. The penetrations are in parking garage exhaust or supply shafts that are separated from other building shafts by not less than 2-hour fire-resistance-rated construction.
2. In Group B and R occupancies, equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1, smoke dampers are not required at penetrations of shafts where:
 - 2.1. Kitchen, clothes dryer, bathroom and toilet room exhaust openings are installed with steel exhaust subducts, having a wall thickness of at least 0.019 inch (0.48 mm); and
 - 2.2. That extend at least 22 inches (559 mm) vertically; and
 - 2.3. An exhaust fan is installed at the upper terminus of the shaft that is, powered continuously in accordance with the provisions of Section 909.11, so as to maintain a continuous upward airflow to the outside.
3. Smoke dampers are not required at penetration of exhaust or supply shafts in parking garages that are separated from other building shafts by not less than 2-hour fire-resistance-rated construction.
4. Smoke dampers are not required at penetrations of shafts where ducts are used as part of an approved mechanical smoke control system designed in accordance with Section 909 and where the smoke damper will interfere with the operation of the smoke control system.

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5. Fire dampers and combination fire/smoke dampers are not required in kitchen and clothes dryer exhaust system when installed in accordance with the *International Mechanical Code*.

Committee Reason: The committee modified the proposal to be consistent with the action taken previously on FS134-06/07. Therefore the proposal is modified so that no changes will be made to item 2.1 and only the new item 5 will move forward. The addition of exception 5 will be applicable to all occupancies and is not limited to the B and R occupancies as exception 2 is. This exception will basically serve as a cross-reference to the IMC and could be used to address items such as an industrial clothes dryer in a hospital. The IMC will prohibit the installation of dampers within these types of exhaust ducts.

Assembly Action:

None

Final Hearing Results

FS135-06/07

AM

Code Change No: **FS139-06/07**

Original Proposal

Sections: 716.5.6 (New) [IMC 607.5.6 (New)]

Proponent: Gregory R. Keith, Professional heuristic Development, representing The Boeing Company

Add new text as follows:

716.5.6 (IMC 607.5.6) Exterior walls. Ducts and air transfer openings in fire-resistance rated exterior walls in accordance with Section 704.14 shall be protected with listed fire dampers installed in accordance with their listing.

Reason: Although Section 704.14 contains very explicit requirements for protection of duct and air transfer openings in fire-resistance rated exterior walls required to have protected openings, the cross referenced Section 716 contains no duct and air transfer opening protection requirements specifically applicable to exterior walls. Section 716.5 provides general charging language while the following subsections state specific requirements for the various fire-resistance rated assemblies. This proposal provides necessary charging language in Section 716 that responds to the requirement in Section 704.14. A basic fire damper requirement consistent with the protection of exterior wall openings has been provided. It is recommended that this fundamental charging language be approved in this code development cycle. This will allow interested parties the opportunity to modify the technical requirement as they feel necessary. Approval of this proposal will provide necessary charging language that currently does not exist in the *International Building Code*.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: This helps to create a section to place these requirements in so that they are addressed and can be regulated. There is currently no section that picks up the protection requirements for ducts and air transfer openings through an exterior wall even though it is implied. Code users starting in Section 704.14 are referenced to Section 716.5 to determine where dampers are required. By placing this into the general "where required" section it provides clarity and gets to the damper listing provisions. In addition, it also provides consistency with fire walls, fire barriers and fire partitions. The intent is not to override Table 704.8 and permit openings in the 0 to 3 foot range even if they are protected with a damper.

Assembly Action:

None

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Lawrence G. Perry, representing BOMA International, requests Approval as Modified by this public comment.

Modify proposal as follows:

716.5.6 (IMC 607.5.6) Exterior Walls. Ducts and air transfer openings in fire-resistance rated exterior walls required to have protected openings in accordance with Section 704.14 shall be protected with listed fire dampers in accordance with their listing.

Commenter's Reason: Without the addition of 'required to have protected openings' it is not clear whether this 'pointer' is requiring dampers on all ducts and air-transfer openings in rated exterior walls, or only those specifically required to have protected openings. Although it might be argued that this is covered by the reference to 704.14, it isn't clear, and it doesn't make much sense to make someone go digging through the book to find 5 extra words.

An additional question, not addressed by this comment, is whether the existing text at 704.14 and this new text could be read to imply that a fire damper is required on the exhaust duct for an emergency generator, which would be problematic.

Final Hearing Results

FS139-06/07

AMPC1

Code Change No: FS140-06/07

Original Proposal

Sections: 716.5.6 (New), 716.5; IMC 607.5.6 (New), IMC 607.5

Proponent: Gregory R. Keith, Professional heuristic Development, representing The Boeing Company

1. Add new text as follows:

716.5.6 (IMC 607.5.6) Smoke partitions. A listed smoke damper designed to resist the passage of smoke shall be provided at each point that an air transfer opening penetrates a smoke partition. Smoke dampers and smoke damper actuation methods shall comply with Section 716.3.2.1.

Exception: Smoke dampers are not required where the openings in ducts are limited to a single smoke compartment and the ducts are constructed of steel.

2. Revise as follows:

716.5 (IMC 607.5) Where required. Fire dampers, smoke dampers, combination fire/smoke dampers and ceiling radiation dampers shall be provided at the locations prescribed in Sections 716.5.1 through ~~716.5.5~~ 716.5.6. Where an assembly is required to have both fire dampers and smoke dampers, combination fire/smoke dampers or a fire damper and smoke damper shall be required.

Reason: Presently, Section 716.5 has no smoke damper charging language provisions specific to smoke partitions although Section 710.7 requires smoke dampers at air transfer openings. The language proposed for Section 716.5.6 is consistent with the technical requirements of Section 710.7. It is also consistent with the detailed installation requirements for smoke dampers in smoke barriers in accordance with Section 716.5.5. It is only reasonable that an exception to more stringent smoke barrier requirements should also apply to smoke partitions. Approval of this proposal will assist in the proper determination of smoke damper requirements in smoke partitions.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:**Disapproved**

Committee Reason: While the intent is to provide a section for the reference from Section 710.7 to send the users to, this proposal and some of the potential modifications that were discussed during the testimony created confusion. The concern with this proposal is that while the base paragraph addresses air transfer openings, the exception deals with ducts. If the word duct is added into the base paragraph, it would then conflict with Section 710.7 which does not require a damper in a ducted system.

Assembly Action:**None**

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Gregory R. Keith, Professional heuristic Development, representing The Boeing Company, requests Approval as Modified by this public comment.

Modify proposal as follows:

716.5.6 Smoke partitions. A listed smoke damper designed to resist the passage of smoke shall be provided at each point that an air transfer opening penetrates a smoke partition. Smoke dampers and smoke damper actuation methods shall comply with Section 716.3.2.1.

~~Exception: Smoke dampers are not required where the openings in ducts are limited to a single smoke compartment and the ducts are constructed of steel. Where the installation of a smoke damper will interfere with the operation of a required smoke control system in accordance with Section 909, approved alternate protection shall be utilized.~~

716.5 Where required. Fire dampers, smoke dampers, combination fire/smoke dampers and ceiling radiation dampers shall be provided at the locations prescribed in Sections 716.5.1 through 716.5.6. Where an assembly is required to have both fire dampers and smoke dampers, combination fire/smoke dampers shall be required.

Commenter's Reason: Presently, Section 716.5 has no smoke damper charging language provisions specific to smoke partitions although Section 710.7 requires smoke dampers at air transfer openings. The language proposed for Section 716.5.6 is consistent with the detailed installation requirements for smoke dampers in smoke barriers in accordance with Section 716.5.5. It was pointed out during discussion of the item in Orlando, and as noted in the published reason for disapproval, that a proposed exception addressing smoke dampers in ducts was inappropriate in that Section 710.7 only requires smoke dampers at air transfer openings. That exception has been deleted from the proposal. Approval of this proposal will assist in the proper determination of smoke damper requirements in smoke partitions.

Final Hearing Results

FS140-06/07

AMPC1

Code Change No: **FS143-06/07**

Original Proposal

Sections: 716.6.2.1 (IMC 607.6.2.1), Chapter 35

Proponent: Bob Eugene, Underwriters Laboratories Inc.

1. Revise as follows:

716.6.2.1 (IMC 607.6.2.1) Ceiling radiation dampers. Ceiling radiation dampers shall be tested either in accordance with UL 555C or as part of a fire-resistance rated floor-ceiling or roof/ceiling assembly in accordance with ASTM E 119 or UL 263. ~~and~~ Ceiling radiation damper shall be installed in accordance with the details listed in the fire-resistance-rated assembly and the manufacturer's installation instructions and the listing. Ceiling radiation dampers are not required where either of the following applies:

1. Tests in accordance with ASTM E119 or UL 263 have shown that ceiling radiation dampers are not necessary in order to maintain the fire-resistance rating of the assembly.
2. Where exhaust duct penetrations are protected in accordance with Section 712.4.1.2, are located within the cavity of a wall and do not pass through another dwelling unit or tenant space.

2. Add standard to Chapter 35 as follows:

UL
263-03 Standard for Fire Test of Building Construction and Materials

Reason: The purpose of this proposed code change is to provide an additional option for the evaluation of ceiling radiation dampers.

Section 703 of the IBC requires the fire performance of horizontal fire-resistance-rated assemblies to be evaluated in accordance with ASTM E 119 or UL 263 (ASTM E 119 and UL 263 describe the same test method). However, current code language does not specifically permit the evaluation of a ceiling radiation damper as part of the horizontal fire-resistance-rated assembly. This proposal is intended to provide that option.

Section 716.6.2.1 of the IBC currently specifies ceiling radiation dampers are to be evaluated in accordance with UL 555C. UL 555C describes a comparative fire test procedure whereby the fire performance of a candidate ceiling radiation damper is compared to the performance of the hinged door type damper specified in many fire-resistance-rated assemblies published in the UL Fire Resistance Directory. UL 555C requires the ceiling radiation damper to perform equal or better than the hinged door type damper. The resulting listing of the ceiling radiation damper specifies the limitations under which the ceiling radiation damper may be used in a fire-resistance-rated assembly in lieu of the hinged door type damper.

Sub-Section 1 under Section 716.6.2.1 already states ceiling radiation dampers are not required at all when tests conducted to ASTM E 119 have shown that ceiling radiation dampers are not necessary to maintain the fire-resistance rating of the assembly. This proposal is simply a variation of this same logic. If an assembly incorporating a ceiling radiation damper provides the required fire-resistance rating, then that ceiling radiation damper should be permitted in the specific fire-resistance-rated assembly.

When a ceiling radiation damper is evaluated as part of a fire-resistance-rated floor-ceiling or roof-ceiling assembly, the description of the tested fire-resistance-rated assembly will include a description of the ceiling radiation damper and its installation.

ASTM E119 is the prescribed test for fire resistive assemblies. When duct outlets are included in the tested assembly, the duct outlet protective system in accordance with the tested assembly will be just as effective as one that uses a Listed ceiling radiation damper. UL 263 is an ANSI approved standard. Results of the review of the proposed standard(s) will be posted on the ICC website by August 20, 2006.

Bibliography: IBC Section 703

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Note: The following analysis was not in the Code Change Proposal book but was published in the AErrata to the 2006/2007 Proposed Changes to the International Codes and Analysis of Proposed Referenced Standards® provided at the code development hearings:

Analysis: Review of proposed new standard indicated that, in the opinion of staff, the standard did comply with ICC standards criteria.

Committee Action:

Approved as Submitted

Committee Reason: The discussion of FS142 and FS143 were taken together. The committee action on this item is taken based on the broader support for code change FS143-06/07. Because FS143 includes the UL standard as a reference, it provides an additional design option. Adding additional standards as design options coordinates with actions taken earlier at this hearing by the committee.

Assembly Action:

None

Final Hearing Results

FS143-06/07

AS

Code Change No: **FS145-06/07**

Original Proposal

Sections: 717.2.1; IRC R602.8.1

Proponent: Brian Scot Tollisen, P.E., New York Department of State Division of Code Enforcement and Administration

THIS PROPOSAL IS ON THE AGENDA OF THE IBC FIRE SAFETY AND THE IRC BUILDING/ENERGY CODE DEVELOPMENT COMMITTEES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IBC FIRE SAFETY

Revise as follows:

717.2.1 Fireblocking materials. Fireblocking or fill shall not be of any flammable material which can be shaped, fitted and permanently secured in position. Fireblocking shall consist of 2-inch (51 mm) nominal lumber or two thicknesses of 1-inch (25 mm) nominal lumber with broken lap joints or one thickness of 0.719-inch (18.3 mm) wood structural panel with joints backed by 0.719-inch (18.3 mm) wood structural panel or one thickness of 0.75-inch (19

mm) particleboard with joints backed by 0.75-inch (19 mm) particleboard. Gypsum board, cement fiber board, batts or blankets of mineral wool, glass fiber or other approved materials installed in such a manner as to be securely retained in place shall be permitted as an acceptable fireblock. Battis or blankets of mineral wool or glass fiber or other approved nonrigid materials shall be permitted for compliance with the 10-foot (3048 mm) horizontal fireblocking in walls constructed using parallel rows of studs or staggered studs. Loose-fill insulation material, insulating foam sealants and caulk materials shall not be used as a fireblock unless specifically tested in the form and manner intended for use to demonstrate its ability to remain in place and to retard the spread of fire and hot gases. The integrity of fireblocks shall be maintained.

PART II – IRC BUILDING/ENERGY

Revise as follows:

R602.8.1 Materials. Fireblocking or fill shall not be of any flammable material which can be shaped, fitted and permanently secured in position. Except as provided in Section R602.8, Item 4, fireblocking shall consist of 2-inch (51 mm) nominal lumber, or two thicknesses of 1-inch (25.4 mm) nominal lumber with broken lap joints, or one thickness of 23/32-inch (19.8 mm) wood structural panels with joints backed by 23/32-inch (19.8 mm) wood structural panels or one thickness of 3/4-inch (19.1 mm) particleboard with joints backed by 3/4-inch (19.1 mm) particleboard, 1/2-inch (12.7 mm) gypsum board, or 1/4-inch (6.4 mm) cement-based millboard. Battis or blankets of mineral wool or glass fiber or other approved materials installed in such a manner as to be securely retained in place shall be permitted as an acceptable fire block. Battis or blankets of mineral or glass fiber or other approved nonrigid materials shall be permitted for compliance with the 10 foot horizontal fireblocking in walls constructed using parallel rows of studs or staggered studs.

Loose-fill insulation material, insulating foam sealants and caulk materials shall not be used as a fire block unless specifically tested in the form and manner intended for use to demonstrate its ability to remain in place and to retard the spread of fire and hot gases.

Reason: (Part I) To ensure that flammable materials will not be allowed for use as fireblocking in combustible construction.

Currently, IBC Section 717.2.1, as written, appears to allow the use of flammable insulating foam sealants as a fireblocking material. Evaluation service legacy reports recognize flammable insulating foam sealant products as an alternative to the fireblocking materials prescribed in the IBC. The ability to use flammable materials as a fireblocking material does not appear to be consistent with the intent of the fireblocking requirements of the IBC as the materials specified in IBC Section 717.2.1 are not flammable.

IBC Section 717.2.1 requires the integrity of all fireblocks to be maintained. Breaching a fireblock assembly comprised of 2 inch nominal lumber with a conduit and sealing the remaining penetration opening with a flammable material is not consistent with the intent of the requirement to maintain the integrity of the fireblock.

A portion of IBC Section 717.2.1 states “Loose-fill insulation material shall not be used as a fire block unless specifically tested in the form and manner intended for use to demonstrate its ability to remain in place and to retard the spread of fire and hot gases.” It is unclear if the phrase “loose-fill insulation” applies to insulating foam sealants however it does not seem plausible that foam sealants could be considered an alternative to loose-fill insulation unless the material were proven to retard the spread of fire and hot gases.

(Part II) Currently, IRC Section 602.8 as written appears to allow the use of flammable insulating foam sealants as a fireblocking material. Evaluation service legacy reports recognize flammable insulating foam sealant products as an alternative to the fireblocking materials prescribed in the IRC. The ability to use flammable materials as a fireblocking material does not appear to be consistent with the intent of the fireblocking requirements of the IRC as the materials specified in IRC Section R602.8.1 are not flammable.

IRC Section R602.8.1.2 requires the integrity of all fireblocks to be maintained. Breaching a fireblock assembly comprised of 2 inch nominal lumber with a conduit and sealing the remaining penetration opening with a flammable material is not consistent with the intent of the requirement to maintain the integrity of the fireblock..

The last sentence in IRC Section R602.8.1 states “Loose-fill insulation material shall not be used as a fire block unless specifically tested in the form and manner intended for use to demonstrate its ability to remain in place and to retard the spread of fire and hot gases.” It is unclear if the phrase “loose-fill insulation” applies to insulating foam sealants however it does not seem plausible that foam sealants could be considered an alternative to loose-fill insulation unless the material were proven to retard the spread of fire and hot gases.

The language proposed above is consistent with the previous Uniform Code of New York State. For example:

1. Uniform Fire Prevention and Building Code, NYCRR 9B, Section 717.4 (b)(1) “Firestopping or fill shall be of nonflammable material which can be shaped, fitted and permanently secured in position.
2. Uniform Fire Prevention and Building Code, NYCRR 9B, Section 717.4(b)(4) “Flammable materials shall not be permitted as insulation or fill in concealed or attic spaces.”

Cost: The code change proposal will not increase the cost of construction.

Analysis: Since the term “flammable material” is defined in Section 307.2, it is assumed that definition would be applicable to this proposed requirement.

Public Hearing Results

**PART I C IBC FIRE SAFETY
Committee Action:**

Approved as Modified

Modify the proposal as follows:

717.2.1 Fireblocking materials. ~~Fireblocking or fill shall not be of any flammable material which can be shaped, fitted and permanently secured in position.~~ Fireblocking shall consist of 2-inch (51 mm) nominal lumber or two thicknesses of 1-inch (25 mm) nominal lumber with broken lap joints or one thickness of 0.719-inch (18.3 mm) wood structural panel with joints backed by 0.719-inch (18.3 mm) wood structural panel or one thickness of 0.75-inch (19 mm) particleboard with joints backed by 0.75-inch (19 mm) particleboard. Gypsum board, cement fiber board, batts or blankets of mineral wool, ~~glass mineral~~ fiber or other approved materials installed in such a manner as to be securely retained in place shall be permitted as an acceptable fireblock. Batts or blankets of mineral wool ~~or glass, mineral~~ fiber or other approved nonrigid materials shall be permitted for compliance with the 10-foot (3048 mm) horizontal fireblocking in walls constructed using parallel rows of studs or staggered studs. Loose-fill insulation material, insulating foam sealants and caulk materials shall not be used as a fireblock unless specifically tested in the form and manner intended for use to demonstrate its ability to remain in place and to retard the spread of fire and hot gases. The integrity of fireblocks shall be maintained.

Committee Reason: This proposal attempts to help to clarify what fireblocking is and it is attempting to stop the use of flammable materials which may reduce the effectiveness of the fireblocking. While the intent of the proposal is good, the language of the first sentence of the proposal does create a difficulty with certain products which may be used or around which the fireblocking is placed. The modifications help to address the concerns discussed during the testimony by eliminating the first sentence but accepting the added text regarding foam sealants which were the primary concern of this proposal. Additional changes were made to include Amineral fiber® instead of Aglass fiber® which was an issue of discussion during previous code change cycles and resulted in changes in the definitions found in the 2006 IBC. Some brands of caulk have been tested and have been shown to be as effective as the prescribed material or fireblocking.

Assembly Action:

None

PART II C IRC

Committee Action:

Disapproved

Committee Reason: The proposed first sentence, for Section R602.8.1, is inappropriate for use in the IRC.

Assembly Action:

None

Final Hearing Results

FS145-06/07, Part I	AM
FS145-06/07, Part II	D

Code Change No: FS146-06/07

Original Proposal

Sections: 717.2.1, 717.2.1.1, 717.2.1.2 (New), 717.2.1.3, 717.2.1.4

Proponent: Lawrence Brown, CBO, National Association of Home Builders (NAHB)

THIS PROPOSAL IS ON THE AGENDA OF THE IBC FIRE SAFETY AND THE IRC BUILDING/SAFETY CODE DEVELOPMENT COMMITTEES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IBC FIRE SAFETY

Revise as follows:

717.2.1 Fireblocking materials. Fireblocking shall consist of the following materials:

1. 2-inch (51 mm) nominal lumber, ~~or~~
2. Two thicknesses of 1-inch (25 mm) nominal lumber with broken lap joints, ~~or~~
3. One thickness of 0.719-inch (18.3 mm) wood structural panels with joints backed by 0.719-inch (18.3 mm) wood structural panels ~~or~~
4. One thickness of 0.75-inch (19.1 mm) particleboard with joints backed by 0.75-inch (19 mm) particleboard,
5. ½-inch (12.7 mm) Gypsum board, ~~or~~
6. ¼-inch (6.4 mm) Cement-based millboard
7. Batts or blankets of mineral wool or glass fiber or other approved materials installed in such a manner as to be securely retained in place ~~shall be permitted as an acceptable fire block~~

717.2.1.1 Batts or blankets of mineral or glass fiber. Batts or blankets of mineral or glass fiber or other approved nonrigid materials shall be permitted for compliance with the 10-foot (3048 mm) horizontal fireblocking in walls constructed using parallel rows of studs or staggered studs.

717.2.1.2 Unfaced fiberglass. Unfaced fiberglass batt insulation used as fireblocking shall fill the entire cross section of the wall cavity to a minimum height of 16 inches (406 mm) measured vertically. When piping, conduit or similar obstructions are encountered, the insulation shall be packed tightly around the obstruction.

717.2.1.3 Loose-fill insulation material. Loose-fill insulation material shall not be used as a fireblock unless specifically tested in the form and manner intended for use to demonstrate its ability to remain in place and to retard the spread of fire and hot gases.

717.2.1.4 Fireblocking integrity. The integrity of fireblocks shall be maintained.

PART II – IRC BUILDING/ENERGY

Revise as follows:

R602.8.1 Fireblocking materials. Except as provided in Section R602.8, Item 4, fireblocking shall consist of the following materials:

1. 2-inch (51 mm) nominal lumber, ~~or~~
2. Two thicknesses of 1-inch (25.4 mm) nominal lumber with broken lap joints, ~~or~~
3. One thickness of 23/32-inch (19.8 mm) wood structural panels with joints backed by 23/32-inch (19.8 mm) wood structural panels ~~or~~
4. One thickness of 3/4-inch (19.1 mm) particleboard with joints backed by 3/4-inch (19.1 mm) particleboard, ~~or~~
5. 1/2-inch (12.7 mm) gypsum board, ~~or~~
6. 1/4-inch (6.4 mm) cement-based millboard
7. Batts or blankets of mineral wool or glass fiber or other approved materials installed in such a manner as to be securely retained in place ~~shall be permitted as an acceptable fire block~~

R602.8.1.1 Batts or blankets of mineral or glass fiber. Batts or blankets of mineral or glass fiber or other approved nonrigid materials shall be permitted for compliance with the 10 foot horizontal fireblocking in walls constructed using parallel rows of studs or staggered studs.

R602.8.1.2 4 Unfaced fiberglass. Unfaced fiberglass batt insulation used as fireblocking shall fill the entire cross section of the wall cavity to a minimum height of 16 inches (406 mm) measured vertically. When piping, conduit or similar obstructions are encountered, the insulation shall be packed tightly around the obstruction.

R602.8.1.3 Loose-fill insulation material. Loose-fill insulation material shall not be used as a fire block unless specifically tested in the form and manner intended for use to demonstrate its ability to remain in place and to retard the spread of fire and hot gases.

R602.8.1.4 2 Fireblocking integrity. The integrity of all fireblocks shall be maintained.

Reason: (IBC) This is primarily an editorial change. This proposal takes the 7 (seven) fireblocking materials, and the 3 (three) additional sub-provisions located in the current, very lengthy paragraph and separates them into a more user-friendly format. All of the new text (underlined) is the text of the IRC for this same provision, including the 1/2-inch dimension for gypsum board, and the 1/4-inch dimension for Cement fiber board, that are an appropriate minimum thickness for these materials used as fireblocking. The new modifying provision for “unfaced fiberglass” (as an allowed fireblocking material in “(g)”) is also from the IRC and provides the direction needed to install this material to be an effective fireblock. The text shown as stricken in “(g)” above is not needed – because, if the material is allowed as a fireblocking material it is already “acceptable”. All other provisions remain unchanged.

Reason: (IRC) This is primarily an editorial change. This proposal takes the 7 (seven) fireblocking materials, and the 4 (four) sub-provisions located in the current, very lengthy paragraph and separates them into a more user-friendly format. The text shown as stricken in “(g)” above is not needed – because, if the material is allowed as a fireblocking material it is already “acceptable”. All other provisions remain unchanged.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

**PART I C IBC FIRE SAFETY
Committee Action:**

Approved as Submitted

Committee Reason: The editorial style makes it easier to read and see the options that are available for use as a fireblock. The loss of the word *Aor*® after each of the items helps make it clear that any of them are acceptable for use. Dividing the long paragraph into smaller pieces makes the provisions easier to understand and find.

Assembly Action:

None

PART II C IRC

Committee Action:

Approved as Submitted

Committee Reason: This change reformats the requirements into a list. This clarifies the code and makes it more user friendly.

Assembly Action:

None

Final Hearing Results

FS146-06/07, Part I	AS
FS146-06/07, Part II	AS

Code Change No: FS148-06/07

Original Proposal

Section: 719.4

Proponent: Rick Thornberry, P.E., The Code Consortium, Inc., representing Cellulose Insulation Manufacturers Association (CIMA)

Revise as follows:

719.4 Loose-fill insulation. Loose-fill insulation materials that cannot be mounted in the ASTM E 84 apparatus without a screen or artificial supports shall comply with the flame spread and smoke-developed limits of Sections 719.2 and 719.3 when tested in accordance with CAN/ULC S102.2.

Exception: Cellulose loose-fill insulation shall not be required to comply with ~~the flame spread index requirement~~ of CAN/ULC S102.2, provided such insulation complies with the requirements of Section 719.6.

Reason: This code change proposal deletes the requirement that cellulose loose-fill insulation be tested in accordance with CAN/ULC S102.2 for smoke-developed. It should be noted that testing cellulose loose-fill insulation per CAN/ULC S102.2 for flame spread is already preempted by federal regulations promulgated by the Consumer Product Safety Commission (CPSC). However, those regulations do not specifically preempt it from being tested for smoke development. That is why the code currently requires cellulose loose-fill insulation to be tested per ASTM E84 for smoke developed. See the exceptions to Section 719.2 and 719.3.

CAN/ULC S102.2 was originally developed in Canada for testing attic insulation but it never caught on, primarily because of ASTM E970, the critical radiant flux test for attic floor insulation. ASTM E970 is required by both the IRC and IBC and it is specified throughout the world simply because it is a better test for attic insulation. Another major drawback to the CAN/ULC S102.2 test is that it requires major modifications to the ASTM E84 test apparatus. In fact, there are only a couple of Canadian laboratories that can do this test because they made the modifications but there are no US laboratories that can. Furthermore, a Health Canada Laboratories representative who conducts this test publicly stated it is "unreliable and inconsistent". And, the standard hasn't had a consensus revision in more than 18 years.

Several member companies of CIMA have conducted significant numbers of both the ASTM E84 and the CAN/ULC S102.2 tests on cellulose insulation at considerable expense and noted that they get virtually the same "smoke-developed" numbers from both tests. The cost to comply with the current requirement will likely run in the tens of thousands of dollars for the cellulose insulation industry. Thus, we believe there is no technical basis or benefit for testing cellulose loose-fill insulation to CAN/ULC for the sole purpose of obtaining a smoke developed number.

Finally, due to a lack of interest in Canada, CAN/ULC S102.2 has been earmarked by Health Canada for removal from the Canadian government's Product Safety Act.

For all of the above reasons, we respectfully urge the committee to approve this code change proposal which deletes the requirement for testing cellulose loose-fill insulation in accordance with CAN/ULC S102.2 to determine a smoke-developed number.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The ASTM E 84 is not appropriate for the testing of the loose fill insulation. There are testing agencies within the states that do conduct testing to the Canadian standard. The committee discussion focused on the issue of an inconsistency that the proposal would create between Sections 719.3 and 719.4. The proposal would effectively eliminate the smoke-development testing requirement for cellulose loose-fill insulation.

Assembly Action:

None

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Rick Thornberry, P.E., The Code Consortium, Inc., representing Cellulose Insulation Manufacturers Association (CIMA), requests Approval as Modified by this public comment.

Replace proposal as follows:

719.4 Loose-fill insulation. Loose-fill insulation materials that cannot be mounted in the ASTM E84 apparatus without a screen or artificial supports shall comply with the flame spread and smoke-developed limits of Sections 719.2 and 719.3 when tested in accordance with CAN/ULC S102.2.

Exception: Cellulose loose-fill insulation shall not be required to ~~comply with the flame spread index requirements of~~ be tested in accordance with CAN/ULC S102.2, provided such insulation complies with the requirements of Section 719.2 or 719.3, as applicable, and Section 719.6.

Commenter's Reason: The Cellulose Insulation Manufacturers Association (CIMA) has filed this Public Comment to request the ICC voting membership to approve this code change proposal based on the substitute proposal contained in this Public Comment to revise the Exception to Section 719.4 regarding the fire and smoke testing of cellulose loose-fill insulation. We believe, the proposed revisions will better clarify the intent of the original code change proposal to exempt cellulose loose-fill insulation from being tested to two separate fire tests for determination of the smoke developed index (rating). We would also like to respond to some of the statements made in the Committee Reason for recommending disapproval of our original code change proposal.

The Committee states that the ASTM E84 test is not an appropriate test for loose-fill insulation. In general, we agree, certainly from the perspective of determining a flame spread index. However, the way the present code is structured for testing of cellulose loose-fill insulation, the ASTM E84 test is only used to determine the smoke developed index. That index is allowed to be as high as 450, whereas the flame spread index could not be greater than 25. Since there is more than an order of magnitude difference in the required limits, the accuracy of the ASTM E84 test method is not nearly as critical for determining the smoke developed index of a material as it is for determining the flame spread index. Furthermore, cellulose loose-fill insulation tested to ASTM E84 generally results in smoke developed indexes of less than 50. So even if there was a significant error in the test results, there would be no jeopardy of approaching the 450 limit specified in the code.

The Committee has also indicated that testing agencies in the United States do test to the CAN/ULC S102.2. However, it should be clarified that there are testing agencies in the United States that are qualified to test to this standard but they must modify their typical ASTM E84 test apparatus to accomplish that. Currently, there are no such testing labs in the United States that have modified their equipment for this testing. Therefore, any manufacturer wishing to test to the Canadian standard must go to Canada. We do not believe that such a hardship which involves significant additional costs and time is justified for determining a smoke developed rating which by ASTM E84 testing has been shown to be very low. In fact, several cellulose insulation manufacturers who do sell their insulation in Canada or who manufacture their materials in Canada have tested to the CAN/ULC S102.2 test and have shown that the smoke developed ratings are even lower than those determined by the ASTM E84 test method for the same materials. Therefore, the ASTM E84 test method should be adequate for determining the smoke developed index of cellulose loose-fill insulation.

The Committee is also concerned that there is an inconsistency between Sections 719.3 and 719.4. We would also point out that Section 719.2 has a similar exception to that in Section 719.3 that allows the cellulose loose-fill insulation tested in accordance with ASTM E84 to not have to be tested for a flame spread index but only for a smoke developed index. This is not an inconsistency in that the original code requirements incorporated into the International Building Code (IBC) were structured in such a manner as to recognize the unique characteristics of cellulose loose-fill insulation and the Federal preemption on many of the requirements for limiting its combustibility. We have clarified this issue to eliminate what may appear to be an inconsistency by clearly stating in the Exception to Section 719.3 that the cellulose loose-fill insulation is required to comply with Section 719.2 or 719.3, as appropriate, as well as with Section 719.6 which prescribes the Federal preemptive regulations for fire testing of cellulose loose-fill insulation. Under these conditions there is no need to require the cellulose loose-fill insulation to be tested to CAN/ULC S102.2 to determine a smoke developed limit. However, the current code does require cellulose loose-fill insulation to be tested in accordance with ASTM E84 to determine a smoke developed index.

The Committee Reason also indicates that the originally proposed revision to the Exception to Section 719.4 would virtually eliminate smoke developed testing for cellulose loose-fill insulation. We believe this is based on an incorrect interpretation of the code requirements which we have corrected with the above mentioned revisions proposed in this Public Comment. It has always been the intent, as well as the requirement, of the IBC to specify smoke developed index testing in accordance with ASTM E84 for cellulose loose-fill insulation. Furthermore, because of the combustibility test requirements specified by the Federal government through the CPSC that preempt the application of any other fire test requirements, the cellulose loose-fill insulation cannot be mandated to be tested to the Canadian standard for determining a flame spread limitation. Therefore, if the CAN/ULC S102.2 standard cannot be mandated for determining a flame spread limitation for cellulose loose-fill insulation, why should it be invoked for testing to determine a smoke developed limitation when testing that insulation in accordance with ASTM E84 will provide suitable test results for determining a smoke developed index to satisfy compliance with the 450 limitation presently prescribed in the code for all insulation materials?

In conclusion, we believe that the proposed revisions contained in this Public Comment should satisfy the Committee's concerns about the application of the appropriate test methods to cellulose loose-fill insulation. Therefore, we sincerely request that the Committee recommendation for disapproval be overturned and this Public Comment be approved with the modifications shown to the Exception to Section 719.4.

Final Hearing Results

FS148-06/07

AMPC1

Code Change No: FS149-06/07

Original Proposal

Table 720.1(2)

Proponent: Sam Francis, American Forest & Paper Association

Revise table as follows:

TABLE 720.1(2)
RATED FIRE-RESISTANCE PERIODS FOR VARIOUS WALLS AND PARTITIONS ^{a,o,p}

MATERIAL	ITEM NUMBER	CONSTRUCTION	MINIMUM FINISHED THICKNESS FACE-TO-FACE ^b (Inches)			
			4 hour	3 hour	2 hour	1 hour
15. Exterior or interior walls	15-1.12q	2"x6"wood studs at 16"with double top plates, single bottom plate; interior and exterior sides covered with 5/8 "Type X gypsum wallboard, 4'wide, applied horizontally or vertically with vertical joints over studs, and fastened with 21/4 " Type S drywall screws, spaced 12"on center. Cavity to be filled with 5-1/2mineral wool insulation.	—	—	—	6¾
	45-1.16q	2" x 4" wood studs at 16" with double top plates, single bottom plate; interior sides covered with 5/8 " Type X gypsum wallboard, 4' wide, applied horizontally unblocked, and fastened with 21/4 " Type S drywall screws, spaced 12" on center, wallboard joints covered with paper tape and joint compound, fastener heads covered with joint compound. Exterior covered with 3/8 " wood structural panels applied vertically, horizontal joints blocked and fastened with 6d common nails (bright) — 12" on center in the field, 6" on center panel edges. Cavity to be filled with 2 1/2 " mineral wool insulation. Rating established for exposure from interior side only.	—	—	—	4½
	45-1.17 15-1.16g	2"x6"wood studs at 24"centers with double top plates, single bottom plate; interior and exterior side covered with two layers of 5/8 " Type X gypsum wallboard, 4'wide, applied horizontally with vertical joints over studs. Base layer fastened with 21/4 " Type S drywall screws, spaced 24"on center, and face layer fastened with Type S drywall screws, spaced 8"on center, wallboard joints covered with paper tape and joint compound, fastened heads covered with joint compound. Cavity to be filled with 5 1/2 "mineral wool insulation.	=	=	7¾	=
16. Exterior walls rated for fire resistance from the inside only in accordance with Section 704-5.	16-1.1q	2" x 4" wood studs at 16" centers with double top plates, single bottom plate; interior side covered with 5/8 " Type X gypsum wallboard, 4' wide, applied horizontally unblocked, and fastened with 2-1/4 " Type S drywall screws, spaced 12" on center, wallboard joints covered with paper tape and joint compound, fastener heads covered with joint compound. Exterior covered with 3/8 " wood structural panels (oriented strand board), applied vertically, horizontal joints blocked and fastened with 6d common nails (bright) — 12" on center in the field, and 6" on center panel edges. Cavity to be filled with 3-1/2 " mineral wool insulation. Rating established for exposure from interior side only.	—	—	—	4½

CODE CHANGES RESOURCE COLLECTION – INTERNATIONAL BUILDING CODE

MATERIAL	ITEM NUMBER	CONSTRUCTION	MINIMUM FINISHED THICKNESS FACE-TO-FACE ^b (Inches)			
			4 hour	3 hour	2 hour	1 hour
	16-1.2q	2"x 6" (51mm x 152 mm) wood studs at 16 " centers with double top plates, single bottom plate; interior side covered with 5/8 " Type X gypsum wallboard, 4' wide, applied horizontally or vertically with vertical joints over studs and fastened with 21/4 " Type S drywall screws, spaced 12" on center, wallboard joints covered with paper tape and joint compound, fastener heads covered with joint compound, exterior side covered with 7/16 " wood structural panels (oriented strand board) fastened with 6d common nails (bright) spaced 12" on center in the field and 6" on center along the panel edges. Cavity to be filled with 5 1/2 " mineral wool insulation. Rating established from the gypsum-covered side only.	—	—	—	6 ⁹ / ₁₆
	16-1.3	2"x6"wood studs at 16"centers with double top plates, single bottom plates; interior side covered with 5/8 " Type X gypsum wallboard, 4' 4' 4' wide, applied vertically with all joints over framing or blocking and fastened with 21/4 "Type S drywall screws spaced 7"on center. Joints to be covered with tape and joint compound. Exterior covered with 3/8 "wood structural panels (oriented strand board), applied vertically with edges over framing or blocking and fastened with 6d common nails (bright) at 12"on center in the field and 6"on center on panel edges. R-19 fiberglass insulation installed in stud cavity. <u>Rating established from the gypsum-covered side only.</u>	—	—	—	6½

(Portions of table not shown do not change.)

Reason: Item 1: (15-1.12q) This item was among several to be 'corrected' by the new definition of mineral wool. Instead, the printed code lacked the insulation requirement in its entirety. This will correct an editorial/printing error in the 2006 edition.

Item 2: (~~15-1.16q~~ & 16-1.1q) This item was 15-1.16 in the 2003 edition. In an AF&PA code change, a separate group, 16-x.xx was created for assemblies which are asymmetric (16 is for tested for exposure from the inside only which is a condition permitted by the IBC). In addition, a change last year was approved to delete the parenthetical notation of OSB. The purpose of this change is to correct the editorial/printing errors. Item 15-1.16 was moved in a previous code cycle to 16-1.1. It should have been deleted here. This will correct an editorial/printing error in the 2006 edition.

Item 3: (~~15-1.17~~ 15-1.16g) Incorrectly deleted in 2006 edition. No proposal ever took this action. It is intended to keep a two hour assembly in the code table. This will correct an editorial/printing error in the 2006 edition by restoring an item incorrectly deleted during the editing/printing of the 2006 edition.

Item 4: (16-1.2q) This item was moved in the same approved code change as the item above. In addition, a change last year was approved to delete the parenthetical notation of OSB. The purpose of this change is to correct the editorial/printing errors. This will correct an editorial/printing error in the 2006 edition.

Item 5: (16-1.3) This change will correct the editorial/printing errors in the 2006 edition. It also adds the last sentence, present in each of the other assemblies in 16-x.xx, which will require that the rating is asymmetric and is only established for the gypsum side of the assembly.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: As stated in the proponents reason statement, the revisions address items that are currently missing in the code but which were a part of the testing or needed for clarification. Specifically, the revision in item 15-1.12 was a part of the original test and should be included to assure the assembly is properly constructed. The change to item 16-1.3 clarifies that this is a non-symmetrical assembly and it only has a fire-resistance rating from the one side. This also coordinates with the other items in section 16 of the table.

Analysis: The majority of the items shown in the monograph have been previously addressed and accepted as errata to the 2006 edition of the code. The following are considered as errata and will not be acted on by the committee: (1) deletion of existing item 15-1.16; (2) addition of the new item 15-1.16; (3) revisions in item 16-1.1; (4) revisions in item 16.1.2; and (5) the first two revisions shown in item 16-1.3 (the revision to 4 feet and deletion of ~~oriented strand board~~). Therefore, the only changes which are being acted on by the committee are (1) the addition of text into item 15-1.12, and (2) the addition in the last line of item 16.1.3.

Assembly Action:

None

Final Hearing Results

FS149-06/07

AS

Code Change No: **FS150-06/07**

Original Proposal

Table 720.1(2)

Proponent: James Shriver, Thermafiber Inc.

Revise table as follows:

TABLE 720.1(2)
RATED FIRE-RESISTANCE PERIODS FOR VARIOUS WALLS AND PARTITIONS ^{a,o,p}

MATERIAL	ITEM NUMBER	CONSTRUCTION
15. Exterior or interior walls	15-1.13q	2" x 6" wood studs at 16" with double top plates, single bottom plate; interior and exterior sides covered with 5/8" Type X gypsum wallboard, 4' wide, applied vertically with all joints over framing or blocking and fastened with 2 1/4" Type S drywall screws, spaced 12" on center. R-19 fiberglass mineral fiber insulation installed in stud cavity.

(Portions of table not shown do not change)

Reason: Changing the language to mineral fiber will allow either fiberglass or mineral wool insulation in the stud cavity.

Mineral wool insulation is a well known and proven fire resistance material that has been tested, and approved numerous times for all types of fire resistive assemblies. In this type of a wall assembly, the Underwriters Laboratory Fire Resistance Directory lists mineral wool and fiberglass insulations as alternate materials in numerous design listings. Reference UL designs U305, U309, U311, U317, U327, U334, U338, U356 and U359. Specifically, U305 covers this design and lists the insulation as glass fiber or mineral wool with a rating of 1 hr. The same rating as listed in table 720.1(2) item number 15-1.13.

The UL Fire resistance directory also lists all of these designs as 2" x 4" wood studs versus this design with 2" x 6" wood studs. The UL Fire Resistive rating – ANSI/UL 263 (BXUV) design information section VI wall and partition assemblies states the size of the studs are minimum unless otherwise stated. . Therefore the referenced UL designs apply to 2" x 6" construction as well.

By changing the language to mineral fiber as defined in ASTM C168, Standard Terminology Relating to Thermal Insulation, both mineral wool and fiberglass insulation will be allowed in this wall assembly that has been tested and proven to be effective with either materials. Providing this construction with an alternate product also allows the end user more flexibility in their overall building needs.

Mineral wool has been tested in numerous assemblies as noted in the UL listed designs for wood studs – U305, U309, U311, U317 etc. There are also numerous examples in the metal studs listed designs U400 – 499. Specifically U305 is the same design as this construction (15-1.13). UL design listing U305 (attached), line item 5 Batt and Blankets, list glass fiber or mineral wool insulation in the assembly with the same hourly rating. Therefore using mineral wool as an alternant to fiberglass in this assembly will not effect the constructions hourly rating.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: A copy of UL design number BXUV.U305 was submitted but has not been printed here.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: This revision provides consistency with the definition and also with the UL fire-resistance directory. The term A mineral fiber® will pick up both the glass and wool insulation products. Making this revision will allow for the inclusion of additional types of insulating materials other than fiberglass.

Assembly Action:

None

Final Hearing Results

FS150-06/07

AS

Code Change No: FS151-06/07

Original Proposal

Table 720.1(2)

Proponent: Rick Thornberry, P.E., The Code Consortium, Inc., representing Western States Clay Products Association (WSCPA)

Revise table as follows:

**TABLE 720.1(2)
RATED FIRE-RESISTANCE PERIODS FOR VARIOUS WALLS AND PARTITIONS^{a,o,p}**

MATERIAL	ITEM NUMBER	CONSTRUCTION	MINIMUM FINISHED THICKNESS FACE-TO-FACE ^b (inches)			
			4 hour	3 hour	2 hour	1 hour
15. Exterior or interior walls	15-2.1	<u>3 5/8" No. 16 gage steel studs at 24" on center or 2" x 4" wood studs at 24" on center. Metal lath attached to the exterior side of studs with minimum 1" long No. 6 drywall screws at 6" on center and covered with minimum 3/4" thick portland cement plaster. Thin veneer brick units of clay or shale complying with ASTM C1088, Grade TBS or better, installed in running bond in accordance with Section 1405.9. Combined total thickness of the portland cement plaster, mortar, and thin veneer brick units shall be not less than 1 3/4". Interior side covered with one layer of 5/8" thick Type X gypsum wallboard attached to studs with 1" long No. 6 drywall screws at 12" on center.</u>				6
	15-2.2	<u>3 5/8" No. 16 gage steel studs at 24" on center or 2" x 4" wood studs at 24" on center. Metal lath attached to the exterior side of studs with minimum 1" long No. 6 drywall screws at 6" on center and covered with minimum 3/4" thick portland cement plaster. Thin veneer brick units of clay or shale complying with ASTM C1088, Grade TBS or better, installed in running bond in accordance with Section 1405.9. Combined total thickness of the portland cement plaster, mortar, and thin veneer brick units shall be not less than 2". Interior side covered with two layers of 5/8" thick Type X gypsum wallboard. Bottom layer attached to studs with 1" long No. 6 drywall screws at 24" on center. Top layer attached to studs with 1 5/8" long No. 6 drywall screws at 12" on center.</u>			6 7/8	
	15-2.3	<u>3 5/8" No. 16 gage steel studs at 16" on center or 2" x 4" wood studs at 16" on center. Where metal lath is used attach to the exterior side of studs with minimum 1" long No. 6 drywall screws at 6" on center. Brick units of clay or shale installed in accordance with Section 1405.5. Interior side covered with one layer of 5/8" thick Type X gypsum wallboard attached to studs with 1" long No. 6 drywall screws at 12" on center.</u>				6 3/4
	15-2.4	<u>3 5/8" No. 16 gage steel studs at 16" on center or 2" x 4" wood studs at 16" on center. Where metal lath is used attach to the exterior side of studs with minimum 1" long No. 6 drywall screws at 6" on center. Brick units of clay or shale installed in accordance with Section 1405.5. Interior side covered with two layers of 5/8" thick Type X gypsum wallboard. Bottom layer attached to studs with 1" long No. 6 drywall screws at 24" on center. Top layer attached to studs with 1 5/8" long No. 6 drywall screws at 12" on center.</u>			7 7/8	

(Portions of table not shown do not change)

Reason: The purpose of this code change is to incorporate generic exterior/interior wall constructions into Table 720.1(2) for 1-hour and 2-hour walls constructed utilizing thin veneer brick units or brick units in conjunction with 5/8 inch thick Type X gypsum wallboard. These wall assemblies are currently contained in the ICBO Evaluation Service, Inc. Evaluation Report ER-5058. The basis for their evaluation and listing in the evaluation report as complying 1-hour and 2-hour fire-resistance rated exterior/interior wall assemblies is fire test data developed in 1993 by Walter Dickey, Consulting Engineer, who conducted a series of fire tests at Warnock Hersey at their fire testing lab in Pittsburg, CA.

We have reviewed the ICBO Evaluation Service, Inc. Evaluation Report, as well as the fire test data, to verify that it will demonstrate compliance with the 2006 International Building Code (IBC). The result is the text contained in the proposed revisions to Table 720.1(2) for the various wall assemblies of 1-hour and 2-hour fire-resistance ratings utilizing either thin veneer brick units or standard brick units attached as adhered veneer or anchored veneer. Copies of the Evaluation Service Report and the fire test reports are available upon request.

Cost Impact: This proposal will not increase the cost of construction.

Analysis: To view or download copies of ICBO Evaluation Service, Inc. Evaluation Report ER-5058 go to <http://www.icc-es.org> and then select the "Evaluation Reports" link in the left margin.

Public Hearing Results

Committee Action:

Approved as Modified

Modify proposal as follows:

**TABLE 720.1(2)
RATED FIRE-RESISTANCE PERIODS FOR VARIOUS WALLS AND PARTITIONS^{a,o,p}**

MATERIAL	ITEM NUMBER	CONSTRUCTION	MINIMUM FINISHED THICKNESS FACE-TO-FACE ^b (inches)			
			4 hour	3 hour	2 hour	1 hour
15. Exterior or interior walls	15-2.1	3 5/8" No. 16 gage steel studs at 24" on center or 2" x 4" wood studs at 24" on center. Metal lath attached to the exterior side of studs with minimum 1" long No. 6 drywall screws at 6" on center and covered with minimum 3/4" thick portland cement plaster. Thin veneer brick units of clay or shale complying with ASTM C1088, Grade TBS or better, installed in running bond in accordance with Section 1405.9. Combined total thickness of the portland cement plaster, mortar, and thin veneer brick units shall be not less than 1 3/4". Interior side covered with one layer of 5/8" thick Type X gypsum wallboard attached to studs with 1" long No. 6 drywall screws at 12" on center.				6
	15-2.2	3 5/8" No. 16 gage steel studs at 24" on center or 2" x 4" wood studs at 24" on center. Metal lath attached to the exterior side of studs with minimum 1" long No. 6 drywall screws at 6" on center and covered with minimum 3/4" thick portland cement plaster. Thin veneer brick units of clay or shale complying with ASTM C1088, Grade TBS or better, installed in running bond in accordance with Section 1405.9. Combined total thickness of the portland cement plaster, mortar, and thin veneer brick units shall be not less than 2". Interior side covered with two layers of 5/8" thick Type X gypsum wallboard. Bottom layer attached to studs with 1" long No. 6 drywall screws at 24" on center. Top layer attached to studs with 1 5/8" long No. 6 drywall screws at 12" on center.			6 7/8	
	15-2.3	3 5/8" No. 16 gage steel studs at 16" on center or 2" x 4" wood studs at 16" on center. Where metal lath is used attach to the exterior side of studs with minimum 1" long No. 6 drywall screws at 6" on center. Brick units of clay or shale <u>not less than 2 5/8" thick complying with ASTM C 216</u> installed in accordance with Section 1405.5 <u>with a minimum 1" air space</u> . Interior side covered with one layer of 5/8" thick Type X gypsum wallboard attached to studs with 1" long No. 6 drywall screws at 12" on center.				6 3/4 <u>7 7/8</u>
	15-2.4	3 5/8" No. 16 gage steel studs at 16" on center or 2" x 4" wood studs at 16" on center. Where metal lath is used attach to the exterior side of studs with minimum 1" long No. 6 drywall screws at 6" on center. Brick units of clay or shale <u>not less than 2 5/8" thick complying with ASTM C 216</u> installed in accordance with Section 1405.5 <u>with a minimum 1" air space</u> . Interior side covered with two layers of 5/8" thick Type X gypsum wallboard. Bottom layer attached to studs with 1" long No. 6 drywall screws at 24" on center. Top layer attached to studs with 1 5/8" long No. 6 drywall screws at 12" on center.			7 7/8 <u>8 1/2</u>	

(Portions of table not shown remain unchanged)

CODE CHANGES RESOURCE COLLECTION – INTERNATIONAL BUILDING CODE

Committee Reason: The proposal adds additional prescriptive assemblies which use a clay brick veneer. The modifications provide more information within the code rather than relying upon the reference standard to find this requirement. The standard is currently referenced and used in the IBC. The second change that the modification makes is to add the 1-inch air gap. The code currently has this requirement in other sections due to the code’s reference to ACI 530.1. The modification simply adds the air gap requirement and dimension into the assembly so that it is clearly seen and not inadvertently constructed in violation of the standard.

Assembly Action:

None

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Maureen Traxler, City of Seattle Department of Planning and Development, requests Approval as Modified by this public comment.

Modify proposal as follows:

**TABLE 720.1(2)
RATED FIRE-RESISTANCE PERIODS FOR VARIOUS WALLS AND PARTITIONS^{a,o,p}**

MATERIAL	ITEM NUMBER	CONSTRUCTION	MINIMUM FINISHED THICKNESS FACE-TO-FACE ^b (inches)			
			4 hour	3 hour	2 hour	1 hour
15. Exterior or interior walls	15-2.1 ^d	3 5/8" No. 16 gage steel studs at 24" on center or 2" x 4" wood studs at 24" on center. Metal lath attached to the exterior side of studs with minimum 1" long No. 6 drywall screws at 6" on center and covered with minimum 3/4" thick portland cement plaster. Thin veneer brick units of clay or shale complying with ASTM C1088, Grade TBS or better, installed in running bond in accordance with Section 1405.9. Combined total thickness of the portland cement plaster, mortar, and thin veneer brick units shall be not less than 1 3/4". Interior side covered with one layer of 5/8" thick Type X gypsum wallboard attached to studs with 1" long No. 6 drywall screws at 12" on center.				6
	15-2.2 ^d	3 5/8" No. 16 gage steel studs at 24" on center or 2" x 4" wood studs at 24" on center. Metal lath attached to the exterior side of studs with minimum 1" long No. 6 drywall screws at 6" on center and covered with minimum 3/4" thick portland cement plaster. Thin veneer brick units of clay or shale complying with ASTM C1088, Grade TBS or better, installed in running bond in accordance with Section 1405.9. Combined total thickness of the portland cement plaster, mortar, and thin veneer brick units shall be not less than 2". Interior side covered with two layers of 5/8" thick Type X gypsum wallboard. Bottom layer attached to studs with 1" long No. 6 drywall screws at 24" on center. Top layer attached to studs with 1 5/8" long No. 6 drywall screws at 12" on center.			6 7/8	
	15-2.3 ^d	3 5/8" No. 16 gage steel studs at 16" on center or 2" x 4" wood studs at 16" on center. Where metal lath is used attach to the exterior side of studs with minimum 1" long No. 6 drywall screws at 6" on center. Brick units of clay or shale not less than 2 5/8" thick complying with ASTM C 216 installed in accordance with Section 1405.5 with a minimum 1" air space. Interior side covered with one layer of 5/8" thick Type X gypsum wallboard attached to studs with 1" long No. 6 drywall screws at 12" on center.				7 7/8
	15-2.4 ^d	3 5/8" No. 16 gage steel studs at 16" on center or 2" x 4" wood studs at 16" on center. Where metal lath is used attach to the exterior side of studs with minimum 1" long No. 6 drywall screws at 6" on center. Brick units of clay or shale not less than 2 5/8" thick complying with ASTM C 216 installed in accordance with Section 1405.5 with a minimum 1" air space. Interior side covered with two layers of 5/8" thick Type X gypsum wallboard. Bottom layer attached to studs with 1" long No. 6 drywall screws at 24" on center. Top layer attached to studs with 1 5/8" long No. 6 drywall screws at 12" on center.			8 1/2	

(Portions of proposed changes to table not shown do not change)

For SI: 1 inch = 25.4 mm, 1 square inch = 645.2 mm², 1 cubic foot = 0.0283 m³.

- a. Staples with equivalent holding power and penetration shall be permitted to be used as alternate fasteners to nails for attachment to wood framing.
- b. Thickness shown for brick and clay tile is nominal thicknesses unless plastered, in which case thicknesses are net. Thickness shown for concrete masonry and clay masonry is equivalent thickness defined in Section 721.3.1 for concrete masonry and Section 721.4.1.1 for clay masonry. Where all cells are solid grouted or filled with silicone-treated perlite loose-fill insulation; vermiculite loose-fill insulation; or expanded clay, shale or slate lightweight aggregate, the equivalent thickness shall be the thickness of the block or brick using specified dimensions as defined in Chapter 21. Equivalent thickness may also include the thickness of applied plaster and lath or gypsum wallboard, where specified.

- c. For units in which the net cross-sectional area of cored brick in any plane parallel to the surface containing the cores is at least 75 percent of the gross cross-sectional area measured in the same plane.
- d. Shall be used for nonbearing purposes only.
- e. For all of the construction with gypsum wallboard described in this table, gypsum base for veneer plaster of the same size, thickness and core type shall be permitted to be substituted for gypsum wallboard, provided attachment is identical to that specified for the wallboard, and the joints on the face layer are reinforced and the entire surface is covered with a minimum of 1/16-inch gypsum veneer plaster.
- f. The fire-resistance time period for concrete masonry units meeting the equivalent thicknesses required for a 2-hour fire-resistance rating in Item 3, and having a thickness of not less than 7 5/8 inches is 4 hours when cores which are not grouted are filled with silicone-treated perlite loose-fill insulation; vermiculite loose-fill insulation; or expanded clay, shale or slate lightweight aggregate, sand or slag having a maximum particle size of 3/8 inch.
- g. The fire-resistance rating of concrete masonry units composed of a combination of aggregate types or where plaster is applied directly to the concrete masonry shall be determined in accordance with ACI 216.1/TMS 0216. Lightweight aggregates shall have a maximum combined density of 65 pounds per cubic foot.
- h. See also Note b. The equivalent thickness shall be permitted to include the thickness of cement plaster or 1.5 times the thickness of gypsum plaster applied in accordance with the requirements of Chapter 25.
- i. Concrete walls shall be reinforced with horizontal and vertical temperature reinforcement as required by Chapter 19.
- j. Studs are welded truss wire studs with 0.18 inch (No. 7 B.W. gage) flange wire and 0.18 inch (No. 7 B.W. gage) truss wires.
- k. Nailable metal studs consist of two channel studs spot welded back to back with a crimped web forming a nailing groove.
- l. Wood structural panels shall be permitted to be installed between the fire protection and the wood studs on either the interior or exterior side of the wood frame assemblies in this table, provided the length of the fasteners used to attach the fire protection is increased by an amount at least equal to the thickness of the wood structural panel.
- m. The design stress of studs shall be reduced to 78 percent of allowable F_c with the maximum not greater than 78 percent of the calculated stress with studs having a slenderness ratio l_e/d of 33.
- n. For properties of cooler or wallboard nails, see ASTM C 514, ASTM C 547 or ASTM F 1667.
- o. Generic fire-resistance ratings (those not designated as PROPRIETARY* in the listing) in the GA 600 shall be accepted as if herein listed.
- p. NCMA TEK 5-8A shall be permitted for the design of fire walls.
- q. The design stress of studs shall be equal to a maximum of 100 percent of the allowable F_c calculated in accordance with Section 2306.

Commenter's Reason: A condition of the test used to justify the assemblies added to the table in FS151-06/07 is that the assembly was used for non-bearing walls only.

Editor's note: The only change that is being proposed by this public comment is the insertion of the reference to footnote "d" at each of the four new item numbers.

Final Hearing Results

FS151-06/07

AMPC1

Code Change No: **FS152-06/07**

Original Proposal

Table 720.1(2)

Proponent: Shriver, Thermafiber Inc.

Revise table as follows:

TABLE 720.1(2)
RATED FIRE-RESISTANCE PERIODS FOR VARIOUS WALLS AND PARTITIONS ^{a,o,p}

MATERIAL	ITEM NUMBER	CONSTRUCTION
16. Exterior walls rated for fire resistance from the inside only in accordance with Section 704.5.	16-1.3	2" x 6" wood studs at 16" centers with double top plates, single bottom plates; interior side covered with 5/8" Type X gypsum wallboard, 4" wide, applied vertically with all joints over framing or blocking and fastened with 21/4" Type S drywall screws spaced 7" on center. Joints to be covered with tape and joint compound. Exterior covered with 3/8" wood structural panels (oriented strand board), applied vertically with edges over framing or blocking and fastened with 6d common nails (bright) at 12" on center in the field and 6" on center on panel edges. R-19 fiberglass mineral fiber insulation installed in stud cavity.

(Portions of table not shown do not change)

Reason: Changing the language to mineral fiber will allow either fiberglass or mineral wool insulation in the stud cavity.

Mineral wool insulation is a well known and proven fire resistance material that has been tested, and approved numerous times for all types of fire resistive assemblies. In this type of a wall assembly, the Underwriters Laboratory Fire Resistance Directory lists mineral wool and fiberglass insulations as alternate materials in numerous design listings. Reference UL designs U305, U309, U311, U317, U327, U334, U338, U356 and U359. Specifically, U356 covers this design and lists the insulation as glass fiber or mineral wool with a rating of 1 hr. The same rating as listed in table 720.1(2) item number 16-1.3.

The UL Fire resistance directory also lists all of these designs as 2" x 4" wood studs versus this design with 2" x 6" wood studs. The UL Fire Resistive rating – ANSI/UL 263 (BXUV) design information section VI wall and partition assemblies states the size of the studs are minimum unless otherwise stated. Therefore the referenced UL designs apply to 2" x 6" construction as well.

By changing the language to mineral fiber as defined in ASTM C168, Standard Terminology Relating to Thermal Insulation, both mineral wool and fiberglass insulation will be allowed in this wall assembly that has been tested and proven to be effective with either materials. Providing this construction with an alternate product also allows the end user more flexibility in their overall building needs.

Mineral wool has been tested in numerous assemblies as noted in the UL listed designs for wood studs – U305, U309, U311, U317 etc. There are also numerous examples in the metal studs listed designs U400 – 499. Specifically U356 is the same design as this construction (16-1.3). UL design listing U356 (attached), line item 4 Batt and Blankets, list glass fiber or mineral wool insulation in the assembly with the same hourly rating. Therefore using mineral wool as an alternant to fiberglass in this assembly will not effect the constructions hourly rating.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: A copy of UL design BXUV.U356 was submitted but has not been printed here.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: This revision provides consistency with the definition and also with the UL fire-resistance directory. The term A mineral fiber® will pick up both the glass and wool insulation products. Making this revision will allow for the inclusion of additional types of insulating materials other than fiberglass. This is also consistent with the action taken on FS150-06/07 previously.

Assembly Action:

None

Final Hearing Results

FS152-06/07

AS

Code Change No: FS153-06/07

Original Proposal

Sections: 721.1, 721.6, 721.6.1, 721.6.1.1

Proponent: Sam Francis, American Forest & Paper Association

Revise as follows:

721.1 General. The provisions of this section contain procedures by which the fire resistance of specific materials or combinations of materials is established by calculations. These procedures apply only to the information contained in this section and shall not be otherwise used. The calculated fire resistance of concrete, concrete masonry, and clay masonry assemblies shall be permitted in accordance with ACI 216.1/TMS 0216. The calculated fire resistance of steel assemblies shall be permitted in accordance with Chapter 5 of ASCE 29. The calculated fire resistance of exposed wood members and wood decking shall be permitted in accordance with Chapter 16 of ANSI/AF&PA National Design Specification for Wood Construction (NDS) ©.

721.6 Wood assemblies. The provisions of this section contain procedures by which the fire-resistance ratings of wood assemblies are established by calculations.

721.6.1 General. This section contains procedures for calculating the fire-resistance ratings of walls, floor/ceiling and roof/ceiling assemblies based in part on the standard method of testing referenced in Section 703.2.

721.6.1.1 Maximum fire-resistance rating. ~~Fire resistance ratings calculated using the procedures in this section shall be used only for 1-hour rated assemblies.~~ Fire resistance ratings calculated for assemblies using the methods in Section 721.6 shall be limited to a maximum of 1 hour.

Reason: This section is being revised to include reference to the most recent consensus standards for wood structural design for fire resistance. The document referenced in this proposal, the AF&PA NDS, is currently referenced in the IBC. The proposed revision is intended to make it clear that Chapter 16 of the NDS is a separate methodology developed under ANSI procedures in a consensus process. It is a mechanics-based procedure with fire science underpinnings. The procedures previously published by AF&PA and transcribed in Section 721.6 are derived from work by Lei and by NRC. This procedure is developed using work by White, Sumathipala and others.

This methodology affords the designer a way to develop a fire resistance of up to 2 hours at full design load. The calculation procedure accounts for the effects of increasing cross-section to provide increased fire resistance ensuring that sufficient unaffected section remains to resist the loads. This method uses engineering mechanics rather than the empirical calculations found in the current IBC text (Section 721.6). Because the method is soundly based in research, has a mechanics basis, and was developed using a national consensus process, the reference is placed in the general paragraph with the other material standards. Furthermore, the fire resistance calculation procedures in the reference are not limited to 1 hour.

The revision to Section 721.6.1.1 is an editorial change. The sentence was reordered to clearly indicate that 1 hr. fire resistance rating limits of this section only apply to provisions of Section 721.6.

The supporting information for the addition of these design provisions in the NDS, an ANSI consensus standard, are contained in AF&PA *Technical Report 10: Calculating the Fire Resistance of Exposed Wood Members* available as a free download at www.awc.org/pdf/tr10.pdf.

Bibliography:

NDS
TR10

Cost Impact: This proposal offers a new calculation methodology to address numerous design issues previously unavailable using the provisions of Section 721.6. More options traditionally have reduced costs by allowing the most appropriate and effective strategy to be applied to a problem.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The provisions of Section 721.6 are intended to be limited to 1-hour assemblies. The revision to Section 721.6.1.1 are editorial improvements by referring to the specific code section. The change to Section 721.1 adds an additional reference to an existing standard which will permit assemblies to use this method and be able to achieve a fire-resistance rating of greater than 1-hour. The inclusion of this reference provides additional design options and flexibility in calculating fire-resistance ratings.

Assembly Action:

None

Final Hearing Results

FS153-06/07

AS

Code Change No: FS154-06/07

Original Proposal

Section: 721.4.1.1.1

Proponent: Charles Clark, Brick Industry Association (BIA), representing Masonry Alliance for Codes and Standards (MACS)

Revise as follows:

721.4.1.1.1 Hollow clay units. The equivalent thickness, T_e , shall be the value obtained for hollow clay units as determined in accordance with Equation 7-8. The net volume, V_n , of the units shall be determined using the gross volume and percentage of void area determined in accordance with ASTM C 67.

Reason: To clarify that the equivalent thickness of hollow clay units must be calculated according to Equation 7-8 using the gross volume and percentage of void area determined according to ASTM C 67.

The existing provision 721.4.1.1.1 directs the user to determine the equivalent thickness in accordance with ASTM C 67. However, this standard contains no method to calculate equivalent thickness, which should be determined using Equation 7-8 for equivalent thickness. Rather, the gross volume and percentage of void area from ASTM C 67 should be used to determine the net volume of the hollow clay units. This code change clarifies these issues.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: This proposal will assist the code users by telling them what equation to use and how to calculate the factors which are needed for it.

Assembly Action:

None

Final Hearing Results

FS154-06/07

AS

Code Change No: **FS156-06/07**

Original Proposal

Sections: 721.5.1.3, Figure 721.5.1(5), 721.5.1.3.2, 721.5.2.2, 721.5.2.3, 1702.1

Proponent: Philip Brazil, P.E, Reid Middleton, Inc., representing himself

THIS PROPOSAL IS ON THE AGENDA OF THE IBC FIRE SAFETY AND THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES. PART I – IBC FIRE SAFETY

Revise as follows:

721.5.1.3 ~~Spray-applied~~ Sprayed fire-resistant materials. The fire resistance of wide-flange structural steel columns protected with ~~spray-applied~~ sprayed fire-resistant materials, as illustrated in Figure 721.5.1(5), shall be permitted to be determined from the following expression:

$$R = [C_1 (W/D) + C_2] h \quad \text{(Equation 7-13)}$$

Where:

R = Fire resistance (minutes).

h = Thickness of ~~spray-applied~~ sprayed fire-resistant material (inches).

D = Heated perimeter of the structural steel column (inches).

C_1 and C_2 = Material-dependent constants.

W = Weight of structural steel columns (pounds per linear foot).

The fire resistance of structural steel columns protected with intumescent or mastic fire-resistant coatings shall be determined on the basis of fire-resistance tests in accordance with Section 703.2.

**FIGURE 721.5.1(5)
WIDE FLANGE STRUCTURAL STEEL COLUMNS WITH
~~SPRAY-APPLIED~~ SPRAYED FIRE-RESISTANT MATERIALS**

[No additional changes to Figure 721.5.1(5)]

721.5.1.3.2 ~~Spray-applied~~ Identification. ~~Spray-applied~~ Sprayed fire-resistant materials shall be identified by density and thickness required for a given fire-resistance rating.

721.5.2.2 ~~Spray-applied~~ Sprayed fire-resistant materials. The provisions in this section apply to structural steel beams and girders protected with ~~spray-applied~~ sprayed fire-resistant materials. Larger or smaller beam and girder shapes shall be permitted to be substituted for beams specified in approved unrestrained or restrained fire-resistance-rated assemblies, provided that the thickness of the fire-resistant material is adjusted in accordance with the following expression:

$$h_2 = h_1 [(W_1/D_1) + 0.60] / [(W_2/D_2) + 0.60] \quad \text{(Equation 7-17)}$$

where:

- h = Thickness of ~~spray-applied~~ sprayed fire-resistant material in inches.
 W = Weight of the structural steel beam or girder in pounds per linear foot.
 D = Heated perimeter of the structural steel beam in inches.

Subscript 1 refers to the beam and fire-resistant material thickness in the approved assembly.

Subscript 2 refers to the substitute beam or girder and the required thickness of fire-resistant material.

The fire resistance of structural steel beams and girders protected with intumescent or mastic fire-resistant coatings shall be determined on the basis of fire-resistance tests in accordance with Section 703.2.

721.5.2.3 Structural steel trusses. The fire resistance of structural steel trusses protected with fire-resistant materials ~~spray-applied~~ sprayed to each of the individual truss elements shall be permitted to be determined in accordance with this section. The thickness of the fire-resistant material shall be determined in accordance with Section 721.5.1.3. The weight-to-heated-perimeter ratio (W/D) of truss elements that can be simultaneously exposed to fire on all sides shall be determined on the same basis as columns, as specified in Section 721.5.1.1. The weight-to-heated-perimeter ratio (W/D) of truss elements that directly support floor or roof construction shall be determined on the same basis as beams and girders, as specified in Section 721.5.2.1.

The fire resistance of structural steel trusses protected with intumescent or mastic fire-resistant coatings shall be determined on the basis of fire-resistance tests in accordance with Section 703.2.

PART II – IBC STRUCTURAL

Revise definition as follows:

1702.1 General. The following words and terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

SPRAYED FIRE-RESISTANT MATERIALS. Cementitious or fibrous materials that are ~~spray-applied~~ sprayed to provide fire-resistant protection of the substrates.

Reason: The purpose for the proposal is editorial: to use the term “sprayed fire-resistant material” consistently throughout the IBC. Currently, “spray-applied fire-resistant material” is also used in places. All instances of the latter term in the IBC are included in this proposal. Use of the term “sprayed fire-resistant material” is currently found in IBC Sections 603.1 (21), 1702.1 (“sprayed fire-resistant material”), and 1704.10 through 1704.10.5.2.

The proposal will also align the IBC with the ASTM standards applicable to sprayed fire-resistant materials. ASTM E 605 and E 736 are referenced standards of the IBC. ASTM E 759, E 760 and E 761 also apply to sprayed fire-resistant materials. All of these standards consistently refer to the materials as “sprayed” materials.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

PART I C IBC FIRE SAFETY

Committee Action:

Approved as Submitted

Committee Reason: This proposal is truly an editorial change that provides clarification by being used consistently throughout the code and by matching up with the term used in the ASTM standards which the code references for these materials. This proposal switches to the term Asprayed® versus Aspray-applied® wherever that term was used in the code. This will make the IBC terminology consistent so that only one term is used. This does coordinate with the intent of a previous code change from the last cycle.

Assembly Action:

None

PART II C IBC STRUCTURAL

Committee Action:

Approved as Submitted

Committee Reason: This proposal makes the code provisions for sprayed fire-resistant materials easier to apply by providing consistent terminology throughout the IBC.

Assembly Action:

None

Final Hearing Results

FS156-06/07, Part I	AS
FS156-06/07, Part II	AS

Code Change No: **FS157-06/07**

Original Proposal

Sections: 803.1, 803.2, 803.5

Proponent: Marcelo M. Hirschler, GBH International, representing American Fire Safety Council

Revise as follows:

803.1 General. Interior wall and ceiling finishes shall be classified in accordance with ASTM E 84. Such interior finish materials shall be grouped in the following classes in accordance with their flame spread and smoke-developed indexes.

- Class A: Flame spread index 0-25; smoke-developed index 0-450.
- Class B: Flame spread index 26-75; smoke-developed index 0-450.
- Class C: Flame spread index 76-200; smoke-developed index 0-450.

Exception: Materials, ~~other than textiles~~, tested in accordance with Section 803.2.

803.2. Interior wall or ceiling finishes ~~other than textiles~~. Interior wall or ceiling finishes, ~~other than textiles~~, shall be permitted to be tested in accordance with NFPA 286. Finishes tested in accordance with NFPA 286 shall comply with Section 803.2.1.

803.5 Interior finish requirements based on group. Interior wall and ceiling finish shall have a flame spread index not greater than that specified in Table 803.5 for the group and location designated. Interior wall and ceiling finish materials, ~~other than textiles~~, tested in accordance with NFPA 286 and meeting the acceptance criteria of Section 803.2.1, shall be permitted to be used where a Class A classification in accordance with ASTM E 84 is required.

Reason: Section 803.6.3, as modified in the last cycle, permits textile wall and ceiling coverings to be tested in accordance with NFPA 286. Therefore the clause referring to "other than textiles" in the exception to 803.1, in the text and title of 803.2 and in 803.5, now creates an unnecessary conflict. Eliminating the clause "other than textiles" eliminates the conflict. This proposal does not provide new requirements since testing of textile wall and ceiling coverings by NFPA 286 is allowed but not required.

This proposal also replaces the nouns "flame spread" and "smoke developed" by "flame spread index" and "smoke developed index", since that is the correct terminology used in ASTM E 84.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: This proposal is primarily going to help coordinate these sections with changes which were made in the last cycle and that appear in the 2006 edition of the code. Textile materials are permitted to be tested in accordance with the NFPA 286 room corner test and therefore should not be excluded in these sections. The inclusion of the term index® makes the provisions consistent with the terminology and reporting from ASTM E 84.

Assembly Action:

None

Final Hearing Results

FS157-06/07

AS

Code Change No: **FS158-06/07**

Original Proposal

Section: 803.2

Proponent: Marcelo M. Hirschler, GBH International, representing American Fire Safety Council

Revise as follows:

803.2. Interior wall or ceiling finishes ~~other than textiles~~. Interior wall or ceiling finishes, ~~other than textiles~~, shall be permitted to be tested in accordance with NFPA 286. Finishes tested in accordance with NFPA286 shall comply with Section 803.2.1.

Reason: Section 803.6.3, as modified in the last cycle, permits textile wall coverings to be tested in accordance with NFPA 286. Therefore this clause in the text and title of 803.2 now creates an unnecessary conflict.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: This is consistent with the action taken on FS157-06/07 which made the same proposal. Under the 2006 edition of the code, textiles are permitted to be tested using the NFPA 286 room corner test. Therefore, the language which prohibited this needs to be removed for consistency with Section 803.6 and 803.6.3.

Assembly Action:

None

Final Hearing Results

FS158-06/07

AS

Code Change No: **FS160-06/07**

Original Proposal

Sections: 801.1, 801.2 (New), 801.3 (New), 801.1.1, 801.1.2, 801.1.3, 801.2, 801.2.1, 801.2.2, 803.1, 803.1.1, 803.2, 803.2.1, 803.1.3 (New), 803.1.3.1 (New), 803.1.4 (New), 803.2 (New), 803.3 (New), 803.4 (New), 803.5 (New), 803.6 (New), 803.7 (New), 803.8 (New)

Proponent: Marcelo M. Hirschler, GBH International, representing American Fire Safety Council

Revise as follows:

801.1 Scope. Provisions of this chapter shall govern the use of materials used as interior finishes, trim and decorative materials.

801.2 Interior wall and ceiling finish. The provisions of 803 shall limit the allowable fire performance and smoke development of interior wall and ceiling finish materials based on occupancy classification.

801.3 Interior floor finish. The provisions of 804 shall limit the allowable fire performance of interior floor finish materials based on occupancy classification

~~801.1.1 Interior finishes.~~ These provisions shall limit the allowable flame spread and smoke development based on location and occupancy classification.

Exceptions:

1. ~~Materials having a thickness less than 0.036 inch (0.9 mm) applied directly to the surface of walls or ceilings.~~
2. ~~Exposed portions of structural members complying with the requirements for buildings of Type IV construction in Section 602.4 shall not be subject to interior finish requirements.~~

[F] 801.1.2 801.4 Decorative materials and trim. Decorative materials and trim shall be restricted by combustibility and flame resistance in accordance with Section 806.

~~801.1.3 801.5 Applicability.~~ For buildings in flood hazard areas as established in Section 1612.3, interior finishes, trim and decorative materials below the design flood elevation shall be flood-damage-resistant materials.

801.2 801.6 Application. Combustible materials shall be permitted to be used as finish for walls, ceilings, floors and other interior surfaces of buildings.

~~801.2.1 801.7 Windows.~~ Show windows in the first story of buildings shall be permitted to be of wood or of unprotected metal framing.

~~801.2.2 801.8 Foam plastics.~~ Foam plastics shall not be used as interior finish or trim except as provided in Section 803.4. Foam plastics shall not be used as interior trim except as provided in Section 806.3 or Section 2604.2 2603.9 or 2604. This section shall apply both to exposed foam plastics and to foam plastics used in conjunction with a textile or vinyl facing or cover.

SECTION 802: (No change to current text)

**SECTION 803
WALL AND CEILING FINISHES**

803.1 General. Interior wall and ceiling finish materials shall be classified for fire performance and smoke development in accordance with 803.1.1 or 803.1.2, except as shown in 803.2 through 803.8. Materials tested in accordance with 803.1.2 shall not be required to be tested in accordance with 803.1.1.

803.1.1 Interior wall and ceiling finish materials. Interior wall and ceiling finish materials finishes shall be classified in accordance with ASTM E 84. Such interior finish materials shall be grouped in the following classes in accordance with their flame spread and smoke-developed indexes.

- Class A: Flame spread index 0-25; smoke-developed index 0-450.
- Class B: Flame spread index 26-75; smoke-developed index 0-450.
- Class C: Flame spread index 76-200; smoke-developed index 0-450.

Exception: ~~Materials, other than textiles,~~ tested in accordance with Section 803.1.2 803-2.

803.2 803.1.2 . Room corner test for interior ~~Interior wall or ceiling finish materials finishes other than textiles.~~ Interior wall or ceiling finish materials finishes, ~~other than textiles,~~ shall be permitted to be tested in accordance with NFPA 286. Interior wall or ceiling finish materials ~~Finishes~~ tested in accordance with NFPA 286 shall comply with Section ~~803.2.4~~ 803.1.2.1.

~~803.2.1 803.1.2.1 Acceptance criteria for NFPA 286.~~ During the 40 kW exposure, the interior finish shall comply with Item 1. During the 160 kW exposure, the interior finish shall comply with Item 2. During the entire test, the interior finish shall comply with Items 3 and 4.

1. During the 40kW exposure, flames shall not spread to the ceiling.
2. During the 160 kW exposure, the interior finish shall comply with the following:
 - 2.1. Flame shall not spread to the outer extremity of the sample on any wall or ceiling.
 - 2.2. Flashover, as defined in NFPA 286, shall not occur.
3. The peak rate of heat release throughout the NFPA 286 test shall not exceed 800 kW.
4. The total smoke released throughout the NFPA 286 test shall not exceed 1,000 m².

803.1.3 Room corner test for textile wall coverings and expanded vinyl wall coverings. Textile wall coverings and expanded vinyl wall coverings shall meet the criteria of Section 803.1.3.1 when tested in the manner intended for use in accordance with the Method B protocol of NFPA 265 using the product mounting system, including adhesive.

803.1.3.1 Acceptance criteria for NFPA 265. During the 40 kW exposure the interior finish shall comply with item 1. During the 150 kW exposure, the interior finish shall comply with item 2. During the entire test, the interior finish shall comply with item 3.

1. During the 40 kW exposure, flames shall not spread to the ceiling.
2. During the 150 kW exposure, the interior finish shall comply with the following:
 - 2.1. Flame shall not spread to the outer extremities of the samples on the 8-foot by 12-foot (203 mm by 305 mm) walls.
 - 2.2. Flashover, as described in NFPA 265, shall not occur.
3. The total smoke released throughout the NFPA 265 test shall not exceed 1,000 m².

803.1.4 Acceptance criteria for textile and expanded vinyl wall or ceiling coverings tested to ASTM E 84. Textile wall and ceiling coverings and expanded wall and ceiling coverings shall have a Class A flame spread index in accordance with ASTM E 84 and be protected by automatic sprinklers installed in accordance with Section 903.3.1.1 or 903.3.1.2.

803.2 Thickness exemption Materials having a thickness less than 0.036 inch (0.9 mm) applied directly to the surface of walls or ceilings shall not be required to be tested.

803.3 Heavy time exemption. Exposed portions of structural members complying with the requirements for buildings of Type IV construction in Section 602.4 shall not be subject to interior finish requirements.

803.4 Foam plastics. Foam plastics shall not be used as interior finish except as provided in Section 2603.9. This section shall apply both to exposed foam plastics and to foam plastics used in conjunction with a textile or vinyl facing or cover. Foam plastics shall be permitted to be tested in accordance with Section 803.1.2, in the manner intended for use, and meet the criteria of 803.1.2.1.

803.5 Textile wall Coverings. Where used as interior wall finish materials, textile wall coverings, including materials having woven or nonwoven, napped, tufted, looped or similar surface and carpet and similar textile materials, shall be tested in the manner intended for use, using the product mounting system, including adhesive, and shall comply with the requirements of section 803.1.2, 803.1.3 or 803.1.4.

803.6 Textile ceiling coverings. Where used as interior ceiling finish materials, textile ceiling coverings, including materials having woven or nonwoven, napped, tufted, looped or similar surface and carpet and similar textile materials, shall be tested in the manner intended for use, using the product mounting system, including adhesive, and shall comply with the requirements of section 803.1.2 or 803.1.4.

803.7 Expanded vinyl wall coverings. Where used as interior wall finish materials, expanded vinyl wall coverings shall be tested in the manner intended for use, using the product mounting system, including adhesive, and shall comply with the requirements of section 803.1.2, 803.1.3 or 803.1.4.

803.8 Expanded vinyl ceiling coverings. Where used as interior ceiling finish materials, expanded vinyl ceiling coverings shall be tested in the manner intended for use, using the product mounting system, including adhesive, and shall comply with the requirements of section 803.1.2, or 803.1.4.

(Delete and relocate to 803.10; See below)

803.3 Stability. Interior finish materials regulated by this chapter shall be applied or otherwise fastened in such a manner that such materials will not readily become detached where subjected to room temperatures of 200°F (93°C) for not less than 30 minutes.

(Delete and relocate to 803.11; See below)

803.4 Application. Where these materials are applied on walls, ceilings or structural elements required to have a fire-resistance rating or to be of noncombustible construction, they shall comply with the provisions of this section.

(Delete and relocate to 803.11.1; See below)

803.4.1 Direct attachment and furred construction. Where walls and ceilings are required by any provision in this code to be of fire-resistance-rated or noncombustible construction, the interior finish material shall be applied directly against such construction or to furring strips not exceeding 1.75 inches (44 mm) applied directly against such surfaces. The intervening spaces between such furring strips shall be filled with inorganic or Class A material or shall be fireblocked at a maximum of 8 feet (2438 mm) in any direction in accordance with Section 717.

(Delete and relocate to 803.11.2; See below)

~~**803.4.2 Set-out construction.** Where walls and ceilings are required to be of fire-resistance-rated or noncombustible construction and walls are set out or ceilings are dropped distances greater than specified in Section 803.4.1, Class A finish materials shall be used except where interior finish materials are protected on both sides by an automatic sprinkler system or attached to noncombustible backing or furring strips installed as specified in Section 803.4.1. The hangers and assembly members of such dropped ceilings that are below the main ceiling line shall be of noncombustible materials, except that in Type III and V construction, fire-retardant-treated wood shall be permitted. The construction of each set-out wall shall be of fire-resistance-rated construction as required elsewhere in this code.~~

(Delete and relocate to 803.11.3; See below)

~~**803.4.3 Heavy timber construction.** Wall and ceiling finishes of all classes as permitted in this chapter that are installed directly against the wood decking or planking of Type IV construction or to wood furring strips applied directly to the wood decking or planking shall be fireblocked as specified in Section 803.4.1.~~

(Delete and relocate to 803.11.4; See below)

~~**803.4.4 Materials.** An interior wall or ceiling finish that is not more than 0.25 inch (6.4 mm) thick shall be applied directly against a noncombustible backing.~~

Exceptions:

1. Class A materials.
2. Materials where the qualifying tests were made with the material suspended or furred out from the noncombustible backing.

~~**803.5**~~ **803.9 Interior finish requirements based on group.** Interior wall and ceiling finish shall have a flame spread index not greater than that specified in Table 803.9 for the group and location designated. Interior wall and ceiling finish materials, ~~other than textiles,~~ tested in accordance with NFPA 286 and meeting the acceptance criteria of Section ~~803.1.2.1~~ 803.2.1, shall be permitted to be used where a Class A classification in accordance with ASTM E 84 is required.

(Renumber Table 803.5 as Table 803.9 without any other changes)

~~**803.6 Textiles.** Where used as interior wall or ceiling finish materials, textiles, including materials having woven or nonwoven, napped, tufted, looped or similar surface and carpet and similar textile materials, shall comply with the requirements of section 803.6.1, 803.6.2 or 803.6.3.~~

~~**803.6.1 Surface Burning Characteristic Test.** Textile wall and ceiling coverings shall have a Class A flame spread index in accordance with ASTM E 84 and be protected by automatic sprinklers installed in accordance with Section 903.3.1.1 or 903.3.1.2.~~

~~**803.6.2 Room corner test, textiles.** Textile wall coverings shall meet the criteria of Section 803.6.2.1 when tested in the manner intended for use in accordance with the Method B protocol of NFPA 265 using the product mounting system, including adhesive.~~

~~**803.6.2.1 Method B test protocol.** During the 40 kW exposure the interior finish shall comply with item 1. During the 150 kW exposure, the interior finish shall comply with item 2. During the entire test, the interior finish shall comply with item 3.~~

1. During the 40 kW exposure, flames shall not spread to the ceiling.
2. During the 150 kW exposure, the interior finish shall comply with the following:
 - 2.1. Flame shall not spread to the outer extremities of the samples on the 8-foot by 12-foot (203 mm by 305 mm) walls.
 - 2.2. Flashover, as described in NFPA 265, shall not occur.
3. The total smoke released throughout the NFPA 265 test shall not exceed 1,000 m².

~~**803.6.3 Room corner test, ceiling and wall finish.** Textile wall and ceiling coverings shall meet the criteria of 803.2.1 when tested in the manner intended for use in accordance with NFPA 286 using the product mounting system, including adhesive.~~

~~**803.7 Expanded vinyl wall coverings.** Expanded vinyl wall coverings shall comply with the requirements for textile wall and ceiling materials and their use shall comply with Section 803.5.~~

~~**Exception:** Expanded vinyl wall or ceiling coverings complying with Section 803.2 shall not be required to comply with Section 803.1 or 803.5.~~

803-3 803.10 Stability. Interior finish materials regulated by this chapter shall be applied or otherwise fastened in such a manner that such materials will not readily become detached where subjected to room temperatures of 200°F (93°C) for not less than 30 minutes.

803-4 803.11 Application of interior finish materials to fire-resistance rated structural elements. Where these interior finish materials are applied on walls, ceilings or structural elements required to have a fire-resistance rating or to be of noncombustible construction, they shall comply with the provisions of this section.

803-4.1 803.11.1 Direct attachment and furred construction. Where walls and ceilings are required by any provision in this code to be of fire-resistance-rated or noncombustible construction, the interior finish material shall be applied directly against such construction or to furring strips not exceeding 1.75 inches (44 mm) applied directly against such surfaces. The intervening spaces between such furring strips shall comply with one of the following:

1. be filled with material that is inorganic or non combustible, 2. be filled with material that meets the requirements of a Class A material in accordance with Section 803.1.1 or 803.1.2 or
2. shall be fireblocked at a maximum of 8 feet (2438 mm) in any direction in accordance with Section 717.

803-4.2 803.11.2 Set-out construction. Where walls and ceilings are required to be of fire-resistance-rated or noncombustible construction and walls are set out or ceilings are dropped distances greater than specified in Section 803.11.1 803-4.1, Class A finish materials, in accordance with Section 803.1.1 or 803.1.2, shall be used except where interior finish materials are protected on both sides by an automatic sprinkler system or attached to noncombustible backing or furring strips installed as specified in Section 803.11.1 803-4.1. The hangers and assembly members of such dropped ceilings that are below the main ceiling line shall be of noncombustible materials, except that in Type III and V construction, fire-retardant-treated wood shall be permitted. The construction of each set-out wall shall be of fire-resistance-rated construction as required elsewhere in this code.

803-4.3 803.11.3 Heavy timber construction. Wall and ceiling finishes of all classes as permitted in this chapter that are installed directly against the wood decking or planking of Type IV construction or to wood furring strips applied directly to the wood decking or planking shall be fireblocked as specified in Section 803-4.4 803.11.1.

803-4.4 803.11.4 Materials. An interior wall or ceiling finish that is not more than 0.25 inch (6.4 mm) thick shall be applied directly against a noncombustible backing.

Exceptions:

1. Class A materials, in accordance with Section 803.1.1 or 803.1.2.
2. Materials where the qualifying tests were made with the material suspended or furred out from the noncombustible backing.

SECTION 804 (No change to current text)

SECTION 805: (No change to current text)

SECTION 806: (No change to current text)

803-8 807 Insulation. Thermal and acoustical insulation shall comply with Section 719.

803-9 808 Acoustical ceiling systems. The quality, design, fabrication and erection of metal suspension systems for acoustical tile and lay-in panel ceilings in buildings or structures shall conform with generally accepted engineering practice, the provisions of this chapter and other applicable requirements of this code.

803-9.1 808.1 Materials and installation. Acoustical materials complying with the interior finish requirements of Section 803 shall be installed in accordance with the manufacturer's recommendations and applicable provisions for applying interior finish.

803-9.1.1 808.1.1 Suspended acoustical ceilings. Suspended acoustical ceiling systems shall be installed in accordance with the provisions of ASTM C 635 and ASTM C 636.

803-9.1.2 808.1.2 Fire-resistance-rated construction. Acoustical ceiling systems that are part of fire-resistance-rated construction shall be installed in the same manner used in the assembly tested and shall comply with the provisions of Chapter 7.

CODE CHANGES RESOURCE COLLECTION – INTERNATIONAL BUILDING CODE

Reason: This proposal makes no changes to any requirements but reorganizes the sections so as to create a more logical sequence and to avoid confusion. The rewrite shows all three tests used for interior wall and ceiling finish materials, and their criteria (ASTM E 84, NFPA 286 and NFPA 265). These are in 803.1.1, 803.1.2 and 803.1.3, while 803.1.4 shows the requirements for sprinklers when textile or vinyl coverings are tested via ASTM E 84. Sections 803.2 through 803.8 set out the requirements for all interior finish materials that are tested differently from the norm. The section on stability has been moved to appear after all of the fire test requirements, followed by the sections on application of interior finish to fire resistance-rated structural elements. The sections on insulation and acoustical ceiling systems have been moved to the end of the chapter. The proposal makes it clear that everywhere that a Class A material is required, a material that has passed NFPA 286 (per 803.1.2.1) is also permitted.

The proposal also eliminates a contradiction in the code, because there are several areas where the code at present says “other than textiles” when referring to NFPA 286. These sections are: the exception in 803.1, section 803.2 and section 803.5. However, sections 803.6 and 803.6.3 already permit textiles to be tested with NFPA 286. Therefore, the proposal just cleans up a problem without changing requirements. The following chart will help track the reformatting done by this code change proposal.

2006 IBC	Code Change for 2009 IBC
Section 801 General	
801.1 Scope	Same
801.1.1 Interior finishes	Delete
	801.2 Interior wall and ceiling finish
	801.3 Interior floor finish
801.1.2 Decorative materials and trim	801.4 Decorative materials and trim
801.1.3 Applicability	801.5 Applicability
801.2 Application	801.6 Application
801.2.1 Windows	801.7 Windows
801.2.2 Foam plastics	801.8 Foam plastics
Section 802 No Change	
Section 803 Wall and Ceiling Finishes	
803.1 General	803.1 General
	803.1.1 Interior wall and ceiling finish materials
803.2 Interior wall or ceiling finishes other than textiles	803.1.2 Room corner test for interior wall or ceiling finish materials
803.2.1 Acceptance criteria	803.1.2.1 Acceptance criteria for NFPA 286
	803.1.3 Room corner test for textile wall coverings and expanded vinyl wall coverings
	803.1.3.1 Acceptance criteria for NFPA 265
	803.1.4 Acceptance criteria for textile and expanded vinyl wall or ceiling coverings tested to ASTM E 84
	803.2 Thickness exemption
	803.3 Heavy timber exemption
	803.4 Foam plastics
	803.5 Textile Wall Coverings
	803.6 Textile Ceiling Coverings
	803.7 Expanded Vinyl Wall Coverings
	803.8 Expanded Vinyl Ceiling Coverings
803.3 Stability	803.10 Stability
803.4 Application	803.11 Application of interior finish materials to fire-resistance rated structural elements
803.4.1 Direct attachment and furred construction	803.11.1 Direct attachment and furred construction
803.4.2 Set-out construction	803.11.2 Set-out construction
803.4.3 Heavy timber construction	803.11.3 Heavy timber construction
803.4.4 Materials	803.11.4 Materials
803.5 Interior finish requirements based on group	803.9 Interior finish requirements based on group
803.6 Textiles	
803.6.1 Surface burning characteristic test	
803.6.2 Room corner test, textiles	
803.6.2.1 Method B test protocol	
803.6.3 Room corner test, ceiling and wall finish	
803.7 Expanded vinyl wall coverings	
Section 804 No Change	
Section 805 No Change	
Section 806 No Change	
803.8 Insulation	807 Insulation
803.9 Acoustical ceiling systems	808 Acoustical ceiling systems
803.9.1 Materials and installation	808.1 Materials and installation
803.9.1.1 Suspended acoustical ceilings	808.1.1 Suspended acoustical ceilings
803.9.1.2 Fire-resistance-rated construction	808.1.2 Fire-resistance-rated construction

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Modified

Modify the proposal as follows:

803.4 Foam plastics. Foam plastics shall not be used as interior finish except as provided in Section 2603.9. This section shall apply both to exposed foam plastics and to foam plastics used in conjunction with a textile or vinyl facing or cover. ~~Foam plastics shall be permitted to be tested in accordance with Section 803.1.2, in the manner intended for use, and meet the criteria of 803.1.2.1.~~

(Portions of proposal not shown remain unchanged)

Committee Reason: This is essentially an editorial change that helps to put the requirements of Chapter 8 into a more logical order. This type of rewrite has been discussed for several years in both the IBC Fire Safety committee hearings and also in front of the IFC committee. This should make the code more usable. The modification made by the committee was simply done to delete what was viewed as repetitive language. The first sentence of the new Section 803.4 indicates that foam plastics are to be regulated by the provisions in Chapter 26. That sentence is appropriate and is all that is needed. The remainder of the proposal is approved as submitted.

Assembly Action:

None

Final Hearing Results

FS160-06/07

AM

Code Change No: **FS163-06/07**

Original Proposal

Section: 901.6.2

Proponent: Robert J Davidson, Davidson Code Concepts, Tinton Falls, NJ, representing himself

Revise as follows:

901.6.2 Fire alarm systems. Fire alarm systems required by the provisions of Section 907.2 of this code and Sections 907.2 and 907.3 of the *International Fire Code* shall be monitored by an approved supervising station in accordance with Section 907.14.

Exceptions:

1. Single- and multiple-station smoke alarms required by Section 907.2.10.
2. Smoke detectors in Group I-3 occupancies.
3. Supervisory service is not required for automatic sprinkler systems in one- and two-family dwellings.

Reason: Whether the required fire alarm system is being installed in new construction pursuant to Section 907.2 of the IBC and Section 907.2 of the IFC, or is being installed in an existing building or structure pursuant to Section 907.3 of the IFC, the need for alarm system supervision is the same.

This proposal adds Section 907.3 of the IFC to the existing language of Section 901.6.2 of the IBC to ensure these required fire alarm systems have the same level of supervisory service.

Cost Impact: The code change proposal will increase the cost of construction.

Analysis: IFC Section 907.3 addresses where fire alarm and detection systems are required to be installed in existing buildings on a retroactive basis.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The proposal provides needed correlation between the IBC and IFC with respect to alarm system supervision in both new and retroactively required systems.

Assembly Action:

None

Final Hearing Results

FS163-06/07

AS

Code Change No: FS165-06/07

Original Proposal

Sections: 906.1 (New), Table 906.1 (New), 906.2 (New), 906.3 (New), 906.3(1) (New), 906.3(2) (New), 906.4 (New), 906.5 (New), 906.6 (New), 906.7 (New), 906.8 (New), 906.9 (New), 906.10 (New)

Proponent: Jerry R. Tepe, JRT-AIA Architect, Hopkinton, NH

Delete and substitute as follows:

[F] 906.1 General. Portable fire extinguishers shall be provided in occupancies and locations as required by the *International Fire Code*.

**SECTION 906
PORTABLE FIRE EXTINGUISHERS**

[F] 906.1 Where required. Portable fire extinguishers shall be installed in the following locations.

1. In new and existing Group A, B, E, F, H, I, M, R-1, R-2, R-4 and S occupancies.

Exception: In new and existing Group A, B and E occupancies equipped throughout with quick response sprinklers, portable fire extinguishers shall be required only in locations specified in Items 2 through 6.

2. Within 30 feet (9144 mm) of commercial cooking equipment.
3. In areas where flammable or combustible liquids are stored, used or dispensed.
4. On each floor of structures under construction, except Group R-3 occupancies, in accordance with Section 1415.1 of the *International Fire Code*.
5. Where required by the *International Fire Code* sections indicated in Table 906.1.
6. Special-hazard areas, including but not limited to laboratories, computer rooms and generator rooms, where required by the fire code official.

**[F] TABLE 906.1
ADDITIONAL REQUIRED PORTABLE FIRE EXTINGUISHERS**

<u>IFC SECTION</u>	<u>SUBJECT</u>
<u>303.5</u>	<u>Asphalt kettles</u>
<u>307.5</u>	<u>Open burning</u>
<u>308.4</u>	<u>Open flames–torches</u>
<u>309.4</u>	<u>Powered industrial trucks</u>
<u>1105.2</u>	<u>Aircraft towing vehicles</u>
<u>1105.3</u>	<u>Aircraft welding apparatus</u>
<u>1105.4</u>	<u>Aircraft fuel-servicing tank vehicles</u>
<u>1105.5</u>	<u>Aircraft hydrant fuel-servicing vehicles</u>
<u>1105.6</u>	<u>Aircraft fuel-dispensing stations</u>
<u>1107.7</u>	<u>Heliports and helistops</u>
<u>1208.4</u>	<u>Dry cleaning plants</u>

<u>IFC SECTION</u>	<u>SUBJECT</u>
<u>1415.1</u>	<u>Buildings under construction or demolition</u>
<u>1417.3</u>	<u>Roofing operations</u>
<u>1504.4.1</u>	<u>Spray-finishing operations</u>
<u>1505.4.2</u>	<u>Dip-tank operations</u>
<u>1506.4.2</u>	<u>Powder-coating areas</u>
<u>1904.2</u>	<u>Lumberyards/woodworking facilities</u>
<u>1908.8</u>	<u>Recycling facilities</u>
<u>1909.5</u>	<u>Exterior lumber storage</u>
<u>2003.5</u>	<u>Organic-coating areas</u>
<u>2106.3</u>	<u>Industrial ovens</u>
<u>2205.5</u>	<u>Motor fuel-dispensing facilities</u>
<u>2210.6.4</u>	<u>Marine motor fuel-dispensing facilities</u>
<u>2211.6</u>	<u>Repair garages</u>
<u>2306.10</u>	<u>Rack storage</u>
<u>2404.12</u>	<u>Tents, canopies and membrane structures</u>
<u>2508.2</u>	<u>Tire rebuilding/storage</u>
<u>2604.2.6</u>	<u>Welding and other hot work</u>
<u>2903.6</u>	<u>Combustible fibers</u>
<u>3308.11</u>	<u>Fireworks</u>
<u>3403.2.1</u>	<u>Flammable and combustible liquids, general</u>
<u>3404.3.3.1</u>	<u>Indoor storage of flammable and combustible liquids</u>
<u>3404.3.7.5.2</u>	<u>Liquid storage rooms for flammable and combustible liquids</u>
<u>3405.4.9</u>	<u>Solvent distillation units</u>
<u>3406.2.7</u>	<u>Farms and construction sites—flammable and combustible liquids storage</u>
<u>3406.4.10.1</u>	<u>Bulk plants and terminals for flammable and combustible liquids</u>
<u>3406.5.4.5</u>	<u>Commercial, industrial, governmental or manufacturing establishments—fuel dispensing</u>
<u>3406.6.4</u>	<u>Tank vehicles for flammable and combustible liquids</u>
<u>3606.5.7</u>	<u>Flammable solids</u>
<u>3808.2</u>	<u>LP-gas</u>

[F] 906.2 General requirements. Portable fire extinguishers shall be selected, installed and maintained in accordance with this section and NFPA 10.

Exceptions:

1. The travel distance to reach an extinguisher shall not apply to the spectator seating portions of Group A-5 occupancies.

2. Thirty-day inspections shall not be required and maintenance shall be allowed to be once every three years for dry-chemical or halogenated agent portable fire extinguishers that are supervised by a listed and approved electronic monitoring device, provided that all of the following conditions are met:
 - 2.1. Electronic monitoring shall confirm that extinguishers are properly positioned, properly charged and unobstructed.
 - 2.2. Loss of power or circuit continuity to the electronic monitoring device shall initiate a trouble signal.
 - 2.3. The extinguishers shall be installed inside of a building or cabinet in a noncorrosive environment.
 - 2.4. Electronic monitoring devices and supervisory circuits shall be tested every three years when extinguisher maintenance is performed.
 - 2.5. A written log of required hydrostatic test dates for extinguishers shall be maintained by the owner to ensure that hydrostatic tests are conducted at the frequency required by NFPA 10.

[F] 906.3 Size and distribution. For occupancies that involve primarily Class A fire hazards, the minimum sizes and distribution shall comply with Table 906.3(1). Fire extinguishers for occupancies involving flammable or combustible liquids with depths of less than or equal to 0.25-inch (6.35 mm) shall be selected and placed in accordance with Table 906.3(2). Fire extinguishers for occupancies involving flammable or combustible liquids with a depth of greater than 0.25-inch (6.35 mm) or involving combustible metals shall be selected and placed in accordance with NFPA 10. Extinguishers for Class C fire hazards shall be selected and placed on the basis of the anticipated Class A or Class B hazard.

**[F] TABLE 906.3(1)
FIRE EXTINGUISHERS FOR CLASS A FIRE HAZARDS**

	<u>LIGHT (Low) HAZARD OCCUPANCY</u>	<u>ORDINARY (Moderate) HAZARD OCCUPANCY</u>	<u>EXTRA (High) HAZARD OCCUPANCY</u>
<u>Minimum Rated Single Extinguisher</u>	<u>2-A^c</u>	<u>2-A</u>	<u>4-Aa</u>
<u>Maximum Floor Area Per Unit of A</u>	<u>3,000 square feet</u>	<u>1,500 square feet</u>	<u>1,000 square feet</u>
<u>Maximum Floor Area For Extinguisher^b</u>	<u>11,250 square feet</u>	<u>11,250 square feet</u>	<u>11,250 square feet</u>
<u>Maximum Travel Distance to Extinguisher</u>	<u>75 feet</u>	<u>75 feet</u>	<u>75 feet</u>

For SI: 1 foot = 304.8 mm, 1 square foot = 0.0929m², 1 gallon = 3.785 L.

- a. Two 2.5-gallon water-type extinguishers shall be deemed the equivalent of one 4-A rated extinguisher.
- b. Annex E.3.3 of NFPA 10 provides more details concerning application of the maximum floor area criteria.
- c. Two water-type extinguishers each with a 1-A rating shall be deemed the equivalent of one 2-A rated extinguisher for Light (Low) Hazard Occupancies.

**[F] TABLE 906.3(2)
FLAMMABLE OR COMBUSTIBLE LIQUIDS WITH DEPTHS
OF LESS THAN OR EQUAL TO 0.25-INCH**

<u>TYPE OF HAZARD</u>	<u>BASIC MINIMUM EXTINGUISHER RATING</u>	<u>MAXIMUM TRAVEL DISTANCE TO EXTINGUISHERS (feet)</u>
<u>Light (Low)</u>	<u>5-B</u>	<u>30</u>
	<u>10-B</u>	<u>50</u>
<u>Ordinary (Moderate)</u>	<u>10-B</u>	<u>30</u>
	<u>20-B</u>	<u>50</u>
<u>Extra (High)</u>	<u>40-B</u>	<u>30</u>
	<u>80-B</u>	<u>50</u>

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm.

NOTE. For requirements on water-soluble flammable liquids and alternative sizing criteria, see Section 4.3 of NFPA 10.

[F] 906.4 Cooking grease fires. Fire extinguishers provided for the protection of cooking grease fires shall be of an approved type compatible with the automatic fire-extinguishing system agent and in accordance with Section 904.11.5 of the *International Fire Code*.

[F] 906.5 Conspicuous location. Portable fire extinguishers shall be located in conspicuous locations where they will be readily accessible and immediately available for use. These locations shall be along normal paths of travel, unless the fire code official determines that the hazard posed indicates the need for placement away from normal paths of travel.

[F] 906.6 Unobstructed and unobscured. Portable fire extinguishers shall not be obstructed or obscured from view. In rooms or areas in which visual obstruction cannot be completely avoided, means shall be provided to indicate the locations of extinguishers.

[F] 906.7 Hangers and brackets. Hand-held portable fire extinguishers, not housed in cabinets, shall be installed on the hangers or brackets supplied. Hangers or brackets shall be securely anchored to the mounting surface in accordance with the manufacturer's installation instructions.

[F] 906.8 Cabinets. Cabinets used to house portable fire extinguishers shall not be locked.

Exceptions:

1. Where portable fire extinguishers subject to malicious use or damage are provided with a means of ready access.
2. In Group I-3 occupancies and in mental health areas in Group I-2 occupancies, access to portable fire extinguishers shall be permitted to be locked or to be located in staff locations provided the staff has keys.

[F] 906.9 Height above floor. Portable fire extinguishers having a gross weight not exceeding 40 pounds (18 kg) shall be installed so that its top is not more than 5 feet (1524 mm) above the floor. Hand-held portable fire extinguishers having a gross weight exceeding 40 pounds (18 kg) shall be installed so that its top is not more than 3.5 feet (1067 mm) above the floor. The clearance between the floor and the bottom of installed hand-held extinguishers shall not be less than 4 inches (102 mm).

[F] 906.10 Wheeled units. Wheeled fire extinguishers shall be conspicuously located in a designated location.

Reason: To ensure a method of requiring portable fire extinguishers. The *International Building Code* already includes verbatim the text from the *International Fire Code* for sprinkler systems, standpipes, fire alarm systems, etc. Portable fire extinguishers seem to be the only exception. Some jurisdictions do not adopt the *International Fire Code* and cannot get to other codes by reference. Without this change there is no method to require portable fire extinguishers in those jurisdictions without amending the *International Building Code* locally. If it has been deemed necessary to include the other systems, portable fire extinguishers should also be included. There is no intent to make any technical changes with this proposal and code development would remain with the Fire Code Committee.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: The maintenance of the technical content of Section 906 rests with the IFC Code Development Committee. The need for and suitability of duplicating the entire text of the IFC Section 906 into the IBC is a matter to be determined by the IBC-Fire Safety Code Development Committee. Note that this proposal does not include any technical modifications to the content of IFC Section 906.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: Inclusion of these provisions into the IBC will allow the extinguishers to be required in jurisdictions which do not adopt the IFC. If a jurisdiction has not adopted the IFC they would miss this important requirement which is needed for protecting the building. This will also help designers determine the location and requirements for extinguishers so that cabinets and other mounting locations can be determined and installed as a part of the initial building construction. This helps when recessed cabinets are used or if the cabinets are installed within a wall with rated construction.

Assembly Action:

None

Final Hearing Results

FS165-06/07

AS

Code Change No: **FS166-06/07**

Original Proposal

Section: 913 (New)

Proponent: Robert J Davidson, Davidson Code Concepts, representing himself

1. Add new text as follows:

SECTION 913 FIRE PUMPS

913.1 General. Where provided, fire pumps shall be installed in accordance with this section and NFPA 20.

913.2 Protection against interruption of service. The fire pump, driver, and controller shall be protected in accordance with NFPA 20 against possible interruption of service through damage caused by explosion, fire, flood, earthquake, rodents, insects, windstorm, freezing, vandalism and other adverse conditions.

913.3 Temperature of pump room. Suitable means shall be provided for maintaining the temperature of a pump room or pump house, where required, above 40°F (5°C).

913.3.1 Engine manufacturer's recommendation. Temperature of the pump room, pump house or area where engines are installed shall never be less than the minimum recommended by the engine manufacturer. The engine manufacturer's recommendations for oil heaters shall be followed.

913.4 Valve supervision. Where provided, the fire pump suction, discharge and bypass valves, and the isolation valves on the backflow prevention device or assembly shall be supervised open by one of the following methods.

1. Central-station, proprietary, or remote-station signaling service.
2. Local signaling service that will cause the sounding of an audible signal at a constantly attended location.
3. Locking valves open.
4. Sealing of valves and approved weekly recorded inspection where valves are located within fenced enclosures under the control of the owner.

913.4.1 Test outlet valve supervision. Fire pump test outlet valves shall be supervised in the closed position.

913.5. Acceptance test. Acceptance testing shall be done in accordance with the requirements of NFPA 20.

2. Add standard to Chapter 35 as follows:

NFPA

20—03 Installation of Stationary Pumps for Fire Protection

Reason: This proposal provides correlation between the *International Building Code* and the *International Fire Code* by copying existing language from the IFC into the IBC.

Since the standards for the installation of the water based fire protection systems are already in the IBC, the requirements for fire pumps currently in the IFC should also be located in the IBC for ease of use when the installation of fire pumps is required.

This addition to the IBC will also solve a problem that is occurring in jurisdictions that adopt the IBC as the only construction document and adopt the IFC or another code as a maintenance document. In some cases the plan reviewers and inspectors performing the construction related duties are not referring to the requirements found in the IFC at the time of construction.

Recognizing the multitude of different ways that the IBC, the IFC, or both are adopted and enforced, these codes must work either together or separately to accomplish the desired result.

This effort was initiated by an action item from ICC's Federal Agency Codes and Standards Forum. There is a need for this in jurisdictions without the IFC, and this change will streamline the design process in jurisdictions where both codes were in effect.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: The maintenance of the technical contents of IFC Section 913 (source of this proposal) rests with the IFC Code Development Committee. The need for and suitability of duplicating the text of these sections into the IBC is a matter to be determined by the IBC-Fire Safety Code Development Committee. Note that this proposed code change does not include any technical modifications to the content of IFC Section 913 but that the testing and maintenance issues are not being brought into the IBC. This proposal does not include the following items from the IFC: the testing and maintenance issues of IFC 913.5; the testing of generator sets in IFC 913.5.2; the testing of transfer switches in IFC 913.5.3 and the pump room environmental conditions of IFC 913.5.4. Results of the review of the proposed standard(s) will be posted on the ICC website by August 20, 2006.

Public Hearing Results

Committee Action:**Approved as Submitted**

Committee Reason: This brings the water supply requirements into the code which is important. The IBC currently does not even contain a reference to the fire pump requirements of the IFC. The inclusion of a fire pump is a design issue related to a piece of equipment which does affect the layout and construction of the building. Including these provisions within the construction code reminds the designer that the pump location, protection and connections be dealt with as a part of the initial design.

Assembly Action:**None**

Final Hearing Results

FS166-06/07

AS

Code Change No: FS168-06/07

Original Proposal

Section: 915 (New)**Proponent:** Robert J Davidson, Davidson Code Concepts, Tinton Falls, NJ, representing himself**Add new text as follows:**

SECTION 915
EMERGENCY RESPONDER SAFETY FEATURES

915.1 Shaftway markings. Vertical shafts shall be identified as required by this section.

915.1.1 Exterior access to shaftways. Outside openings accessible to the fire department and which open directly on a hoistway or shaftway communicating between two or more floors in a building shall be plainly marked with the word SHAFTWAY in red letters at least 6 inches (152 mm) high on a white background. Such warning signs shall be placed so as to be readily discernible from the outside of the building.

915.1.2 Interior access to shaftways. Door or window openings to a hoistway or shaftway from the interior of the building shall be plainly marked with the word SHAFTWAY in red letters at least 6 inches (152 mm) high on a white background. Such warning signs shall be placed so as to be readily discernible.

Exception: Marking shall not be required on shaftway openings which are readily discernible as openings onto a shaftway by the construction or arrangement.

915.2 Pitfalls. The intentional design or alteration of buildings to disable, injure, maim or kill intruders is prohibited. No person shall install and use firearms, sharp or pointed objects, razor wire, explosives, flammable or combustible liquid containers, or dispensers containing highly toxic, toxic, irritant or other hazardous materials in a manner which may passively or actively disable, injure, maim or kill an emergency responder who forcibly enters a building for the purpose of controlling or extinguishing a fire, rescuing trapped occupants or rendering other emergency assistance

915.3 Equipment room identification. Fire protection equipment shall be identified in an approved manner. Rooms containing controls for air-conditioning systems, sprinkler risers and valves, or other fire detection, suppression or control elements shall be identified for the use of the fire department. Approved signs required to identify fire protection equipment and equipment location, shall be constructed of durable materials, permanently installed and readily visible.

Reason: This proposal provides correlation between the International Building Code and the International Fire Code by copying existing language from the IFC into the IBC.

The IBC's stated intent in Section 101.3 includes the safety of emergency responders when operating in buildings and structures. Recognizing the multitude of different ways that the IBC, the IFC, or both are adopted and enforced, these codes must work either together or separately to accomplish the desired result. There are a number of construction (brick & mortar) provisions related to emergency responder safety which appear in the IFC but not the IBC. This potentially results in a gap in certain scenarios, especially jurisdictions which adopt the IBC but not the IFC, or where the IFC is enforced by a fire code official outside the building permitting and inspection process.

The labeling of shaft hazards, prohibition of pitfalls and the marking of equipment doors for identification of controls are important at all times and should be addressed by the IBC at the time of construction in addition to be identified and maintained during maintenance inspections under the IFC.

Certainly it is not the intent to build a structure without critical safety features necessary for Emergency responder activities that routinely occur before a maintenance inspection is scheduled at newly constructed buildings and structures.

Recognizing the multitude of different ways that the IBC, the IFC, or both are adopted and enforced, these codes must work either together or separately to accomplish the desired result.

This effort was initiated by an action item from ICC's Federal Agency Codes and Standards Forum. There is a need for this in jurisdictions without the IFC, and this change will streamline the design process in jurisdictions where both codes were in effect.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: The maintenance of the technical contents of IFC Sections 507.2, 507.3 and 510.1 (source of this proposal) rests with the IFC Code Development Committee. The need for and suitability of duplicating the text of these sections into the IBC is a matter to be determined by the IBC-Fire Safety Code Development Committee. Note that this proposed code change does not include any technical modifications to the content of IFC Sections 507.2, 507.3 and 510.1.

Public Hearing Results

Committee Action:

Approved as Modified

Modify the proposal as follows:

**SECTION 915
EMERGENCY RESPONDER SAFETY FEATURES**

915.1 Shaftway markings. Vertical shafts shall be identified as required by this section.

915.1.1 Exterior access to shaftways. Outside openings accessible to the fire department and which open directly on a hoistway or shaftway communicating between two or more floors in a building shall be plainly marked with the word SHAFTWAY in red letters at least 6 inches (152 mm) high on a white background. Such warning signs shall be placed so as to be readily discernible from the outside of the building.

915.1.2 Interior access to shaftways. Door or window openings to a hoistway or shaftway from the interior of the building shall be plainly marked with the word SHAFTWAY in red letters at least 6 inches (152 mm) high on a white background. Such warning signs shall be placed so as to be readily discernible.

Exception: Marking shall not be required on shaftway openings which are readily discernible as openings onto a shaftway by the construction or arrangement.

~~**915.2 Pitfalls.** The intentional design or alteration of buildings to disable, injure, maim or kill intruders is prohibited. No person shall install and use firearms, sharp or pointed objects, razor wire, explosives, flammable or combustible liquid containers, or dispensers containing highly toxic, toxic, irritant or other hazardous materials in a manner which may passively or actively disable, injure, maim or kill an emergency responder who forcibly enters a building for the purpose of controlling or extinguishing a fire, rescuing trapped occupants or rendering other emergency assistance~~

915.3 Equipment room identification. Fire protection equipment shall be identified in an approved manner. Rooms containing controls for air-conditioning systems, sprinkler risers and valves, or other fire detection, suppression or control elements shall be identified for the use of the fire department. Approved signs required to identify fire protection equipment and equipment location, shall be constructed of durable materials, permanently installed and readily visible.

Committee Reason: The items such as shaftway markings do address hazards which affect the safety of the fire fighters from the first day of occupancy and therefore need to be included within the building code so that the protection is there whenever it is first needed. The committee did feel that these items are related to the building construction, relate to the scope of the document found in IBC Section 101.3 since they are related to fire fighter safety. The committee did modify the proposal by deleting Section 915.2 believing that this element does not belong in the building code but is more of an operational and maintenance issue which should remain in the IFC.

Assembly Action:

Disapproved

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because an assembly action was successful.

Final Hearing Results

FS168-06/07

AM

Code Change No: **FS170-06/07**

Original Proposal

Sections: 1402.1; IRC R202

Proponent: John Mulder, James Hardie Building Products, Inc.

THIS PROPOSAL IS ON THE AGENDA OF THE IBC FIRE SAFETY AND THE IRC CODE DEVELOPMENT COMMITTEES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

Revise as follows:

PART I – IBC FIRE SAFETY

1402.1 General. The following words and terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

FIBER-CEMENT SIDING. A manufactured, fiber-reinforcing product made with an inorganic hydraulic or calcium silicate binder formed by chemical reaction and reinforced with discrete organic or inorganic nonasbestos fibers, or both. Additives that enhance manufacturing or product performance are permitted. Fiber-cement siding products have either smooth or textured faces and are intended for exterior wall and related applications.

PART II – IRC BUILDING/ENERGY

Revise as follows:

SECTION R202 DEFINITIONS

FIBER-CEMENT SIDING. A manufactured, fiber-reinforcing product made with an inorganic hydraulic or calcium silicate binder formed by chemical reaction and reinforced with discrete organic or inorganic non-asbestos fibers, or both. Additives which enhance manufacturing or product performance are permitted. Fiber-cement siding products have either smooth or textured faces and are intended for exterior wall and related applications.

Reason: The purpose of this proposed code change is to clarify the definition of “fiber-cement” to be consistent with the current National Standard ASTM C 1154-02: “fiber-cement products, n – manufactured thin section composites of hydraulic matrices and discrete non-asbestos fibers.”

The current Code language fails to discriminate between “fiber-cement products” (see published definition above); “fiber-mat reinforced products, n – manufactured thin section composites of hydraulic cementitious matrices and non-asbestos fibers in two-dimensional scrim(s)” (published definition in C 1154-02); and “cement-bonded particle board, n – manufactured flat sheets of hydraulic cementitious matrices and fibrous wood particles” (published definition in C 1154-02). This change will clarify existing confusion in the marketplace by clearly describing the nature of the fiber.

ASTM C 1154-02, Standard Terminology for Non-Asbestos Fiber-Reinforced Cement Products.

Bibliography: ASTM International, C 1154-02, Standard Terminology for Non-Asbestos Fiber-Reinforced Cement Products.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: A copy of ASTM C 1154-02 was submitted as a supporting document for this proposal but has not been printed here. A copy of ASTM C 1154-02 is available for purchase directly from ASTM International at <http://www.astm.org>.

Public Hearing Results

PART I C IBC FIRE SAFETY

Committee Action:

Approved as Submitted

Committee Reason: This revision makes the definition consistent with the ASTM standard and helps clarify the products and what the appropriate code requirements are. This will help eliminate confusion which is occurring in the marketplace.

Assembly Action:

None

PART II C IRC

Committee Action:

Approved as Submitted

Committee Reason: This new language in the definition for Fiber-Cement Siding helps to clarify the term and provides a clear means of defining this building product. The definition is now consistent with the language in ASTM C 1154-02.

Assembly Action:

None

Final Hearing Results

FS170-06/07, Part I
FS170-06/07, Part II

AS
AS

Code Change No: FS172-06/07

Original Proposal

Section: 1404.10

Proponent: John Mulder, James Hardie Building Products, Inc.

Revise as follows:

1404.10 Fiber_cement siding. Fiber_cement siding shall conform to the requirements of ASTM C 1186, Type A, and shall be so identified on labeling listing an approved quality control agency.

Reason: The purpose of this proposed Code change is to clarify and correct errors and omissions in the current language describing the recognized products.

Revision of Section 1404.10

The current Code language fails to specify the product "classification type"; either "Type A – Sheets are intended for exterior applications, subject to the direct action of sun, rain or snow" or "Type B – Sheets are intended for exterior application, not subjected to the direct action of sun, rain, or snow" (see ASTM C1186-02, Sections 4.1 and 4.2). Exterior sidings must be suitable for use in exterior applications subject to the direct action of sun, rain or snow. "Type A" should be included in the material description

ICC-ES Acceptance Criteria (AC-90), Section 3.1 supports the proposal for "Type A" sheets (See also evaluation reports for James Hardie Building Products NER-405, Section 3.1; Mexalit Industrial ER-5139, Section 3; and Certaineed Corporation ESR-1668, Section 6.1.

Bibliography:

ASTM C1186-02, Standard Specification for Flat Non-Asbestos Fiber-Cement Sheets.
ICC-ES (AC90) Acceptance Criteria for Fiber Cement Siding used as Exterior Wall Siding.
Certaineed Corporation ES Report ESR-1668
James Hardie Building Products Legacy Report NER-405
Mexalit Industrial Legacy Report ER-5139

Analysis: Copies of all items listed in the bibliography were submitted with this proposal but have not been printed here. To view or download copies of ICC-ES (AC90) Acceptance Criteria for Fiber Cement Siding used as Exterior Wall Siding; Certaineed Corporation ES Report ESR-1668; James Hardie Building Products Legacy Report NER-405; or Mexalit Industrial Legacy Report ER-5139 go to <http://www.icc-es.org> and then select either the "Evaluation Reports" or "Criteria/Guideline" links in the left margin. A copy of ASTM C 1186 is available for purchase directly from ASTM International at <http://www.astm.org>.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The ASTM standard does have distinctions between the type of siding. It is appropriate that the code requires the correct type so that there is no question regarding the appropriateness of a product. This will make determining compliance easier for both the designer and the code official.

Assembly Action:

None

Final Hearing Results

FS172-06/07

AS

Code Change No: FS173-06/07

Original Proposal

Section: 1405.3.2

Proponent: Charles Clark, Brick Industry Association (BIA), representing Masonry Alliance for Codes and Standards (MACS)

Revise as follows:

1405.3 Flashing. Flashing shall be installed in such a manner so as to prevent moisture from entering the wall or to redirect it to the exterior. Flashing shall be installed at the perimeters of exterior door and window assemblies, penetrations and terminations of exterior wall assemblies, exterior wall intersections with roofs, chimneys, porches, decks, balconies and similar projections and at built-in gutters and similar locations where moisture could enter the wall. Flashing with projecting flanges shall be installed on both sides and the ends of copings, under sills and continuously above projecting trim.

1405.3.1 Exterior wall pockets. In exterior walls of buildings or structures, wall pockets or crevices in which moisture can accumulate shall be avoided or protected with caps or drips, or other approved means shall be provided to prevent water damage.

1405.3.2 Masonry. Flashing and weep holes in anchored veneer shall be located in the first course of masonry above finished ground level above the foundation wall or slab, and other points of support, including structural floors, shelf angles and lintels where anchored veneers are designed in accordance with Section 1405.5.

Reason: To clarify the Code. This section has been incorrectly applied to masonry walls with anchored veneer. The intent of the section is to have the flashing and weep holes in the veneer, not in the masonry backup wall. This code change, although minor and editorial, provided the necessary clarification.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:**Approved as Submitted**

Committee Reason: The provisions are not applicable to adhered veneer. Because there are differences between adhered and anchored veneer, it is important that the code distinguish its requirements when the provisions are not applicable to both of the veneer types. This will also coordinate with some other changes that are being heard by other committees this week which will help to clarify the distinction between the veneer types.

Assembly Action:**None**

Final Hearing Results

FS173-06/07

AS

Code Change No: **FS176-06/07**

Original Proposal

Section: 1405.5.2

Proponent: Martin W. Johnson, ABS Consulting, representing NCSEA Seismic Code Advisory Committee

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

Revise as follows:

1405.5.2 Seismic requirements. Anchored masonry veneer located in Seismic Design Category C, D, E or F shall conform to the requirements of Section 6.2.2.10 of ACI530/ASCE5/ TMS 402. Anchored masonry veneer located in Seismic Design Category D shall also conform to the requirements ~~for Seismic Design Category E or F of Section 6.2.2.10.3.3 of ACI530/ ASCE5/ TMS 402.~~

Reason: To clarify the intent of the code.

In the last code change cycle, a floor modification and testimony was offered to S130-04/05 regarding the need to provide wire reinforcement in Seismic Design Category (SDC) D and above, and the need to tie this reinforcement to the anchor. The modified language however went beyond this reinforcement requirement. By requiring that all masonry veneer in SDC D conform to the requirements of SDC E or F, the gravity support of masonry veneer at every floor was triggered per 6.2.2.10.3.2 ACI530/ ASCE5/ TMS 402. Extensive testimony was offered at the Code Change Hearings and at the Public comment Hearings regarding the wire reinforcement and tie requirements, however, no testimony was offered about the gravity support of masonry veneer at every floor. This code change proposal clarifies the code by implementing the intent of the floor modification to S130-04/05.

The proponent shall substantiate the proposed code change based on technical information and substantiation. Substantiation provided which is reviewed in accordance with Section 4.2 and determined as not germane to the technical issues addressed in the proposed code change shall be identified as such. The proponent shall be notified that the proposal is considered an incomplete proposal in accordance with Section 4.3, and the proposal shall be held until the deficiencies are corrected. The proponent shall have the right to appeal this action in accordance with the policy of the ICC Board. The burden of providing substantiating material lies with the proponent of the code change proposal. A minimum of two copies of all substantiating information shall be submitted.

Bibliography: The proponent shall submit a bibliography of any substantiating material submitted with the code change proposal. The bibliography shall be published with the code change and the proponent shall make the substantiating materials available for review at the appropriate ICC office and during the public hearing.

Cost Impact: The code change proposal will not increase the cost of construction. This code change will help reduce the increased cost of construction that resulted from the unintended consequence of the floor modification of S130-04/05.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: This proposal corrects the seismic requirements for anchored masonry veneer by referencing specific requirements in ACI530/ASCE5/TMS402 regarding wire reinforcement and ties.

Assembly Action:

None

Final Hearing Results

FS176-06/07

AS

Code Change No: **FS180-06/07**

Original Proposal

Section: 1405.15

Proponent: Rick Curkeet, PE, Intertek Testing Services NA, Inc.

Revise as follows:

1405.15 Fiber_cement siding. Fiber_cement siding complying with Section 1404.10 shall be permitted on exterior walls of Type I, II, III, IV and V construction for wind pressure resistance or wind speed exposures as indicated in by the manufacturer's compliance report listing and label and approved installation instructions. Where specified, the siding shall be installed over sheathing or materials listed in Section 2304.6 and shall be installed to conform to the water-resistive barrier requirements in Section 1403. Siding and accessories shall be installed in accordance with approved manufacturer's instructions. Unless otherwise specified in the approved manufacturer's instructions, nails used to fasten the siding to wood studs shall be corrosion-resistant round head smooth shank and shall be long enough to penetrate the studs at least 1 inch (25 mm). For metal framing, all-weather screws shall be used and shall penetrate the metal framing at least three full threads.

Reason: The purpose of this proposed Code change is to clarify and define agencies recognized to label and list compliant products for installation in accordance with applicable sections of this Code.

"Compliance Report" is not defined in the Code.

"Label" (IBC Section 1702.1) is defined as: "An identification applied to a product by the manufacturer that contains the name of the manufacturer, the function and performance characteristics of the product or material, and the name and identification of the approved agency and that indicates that the representative sample of the product or material has been tested and evaluated by an approved agency (see Section 1703.5 and "Inspection certificate", "Manufacturer's designation" and "Mark")."

"Listed" (IBC Section 902.1) is defined as: "Equipment, materials or services included in a list published by an organization acceptable to the building official and concerned with evaluation of products or services that maintains periodic inspection of production or listed equipment or materials or periodic evaluation services and whose listing states either that the equipment, material or service meets identified standards or has been tested and found suitable for a specific purpose."

The proposed wording could include, but is not limited to, a "compliance report".

Since there is no definition for "compliance report" in the current IBC. The existing definitions for "label" and "listed" in IBC Sections 1702.1 and 902.1 should be referenced. The existing definitions for "label" and "listed" adequately describe both the intent of and the requirements for an approved agency capable of substantiating the performance of construction as indicated in a manufacturer's approved installation instructions that are also acceptable to the building official. It should not be necessary for a building products manufacturer whose products are already under a third-party "labeling and listing" program (that includes both product type and system testing as well as product and manufacturing facility quality assurance inspections) to also maintain an additional "compliance report" from another vendor. The comprehensive labeling and listing documentation makes a "compliance report" redundant.

Bibliography:

IBC Section 1702.1, "label"

IBC Section 902.1, "listed"

Cost Impact: The code change proposal will not increase the cost of construction

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: As discussed in the proponent's reason statement, the term *A*compliance report® is not defined and is not clear as to what is required. Using the term *A*listing and label® will provide the clarification by using terms which are used and defined within the code. This also assures that because the item is listed, that it has been tested by an approved agency and deemed to comply with the appropriate standard.

Assembly Action:

None

Final Hearing Results

FS180-06/07

AS

Code Change No: FS182-06/07

Original Proposal

Section: 1406.2.2

Proponent: Gene Boecker, Code Consultants, Inc.

Revise as follows:

1406.2.2 Architectural trim. In buildings of Type I, II, III and IV construction ~~that do not exceed three stories or 40 feet (12 192 mm) in height above grade plane~~, exterior wall coverings shall be permitted to be constructed of wood where permitted by Section 1405.4 or other equivalent combustible material. Combustible exterior wall coverings, other than fire-retardant-treated wood complying with Section 2303.2 for exterior installation, shall not exceed 10 percent of an exterior wall surface area where the fire separation distance is 5 feet (1524 mm) or less. ~~Architectural trim that exceeds 40 feet (12 192 mm) in height above grade plane shall be constructed of approved noncombustible materials and shall be secured to the wall with metal or other approved noncombustible brackets.~~ Combustible architectural trim shall be limited to three stories or 40 feet (12 192 mm) above grade plane.

Exceptions:

1. Combustible architectural trim of fire-retardant treated wood shall be permitted up to four stories or 60 feet in height above grade plane.
2. Noncombustible materials shall be permitted to be of any height provided the materials are secured to the wall with metal or other approved noncombustible brackets.

Reason: This proposed change coordinates language and requirements between Section 1405.4 (FS174-06/07) and this section for consistency. A companion change to Section 1405.4 will add text that addresses the height in feet in addition to stories. Because Section 1406.2.2 uses both feet and stories, this section has a height representative of that for the added story increase. The exceptions are extracted from the code text and set out as such for clarity. Because of the limits which have existed in Section 1405.4, no technical change will result from this code change, but the change is needed to bring consistency and clarity to these requirements.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: This is a nice clean up which makes the provisions easier to understand and determine what the section is requiring and accepting. It appropriately limits the height of the trim instead of addressing it based on the height of the building that the trim is applied to.

Assembly Action:

None

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Maureen Traxler, City of Seattle Department of Planning and Development, requests Approval as Modified by the public comment.

Modify proposal as follows:

1406.2.2 Architectural trim. In buildings of Type I, II, III and IV construction, exterior wall coverings shall be permitted to be constructed of wood where permitted by Section 1405.4 or other equivalent combustible material. Combustible exterior wall coverings, other than fire-retardant-treated wood complying with Section 2303.2 for exterior installation, shall not exceed 10 percent of an exterior wall surface area where the fire separation

distance is 5 feet (1524 mm) or less. Combustible architectural trim shall be limited to three stories or 40 feet (12 192 mm) above grade plane. Noncombustible materials shall be permitted to be of any height provided the materials are secured to the wall with metal or other approved noncombustible brackets.

Exceptions:

- 4- Combustible architectural trim of fire-retardant treated wood shall be permitted up to four stories or 60 feet in height above grade plane.
- 2- ~~Noncombustible materials shall be permitted to be of any height provided the materials are secured to the wall with metal or other approved noncombustible brackets.~~

Commenter's Reason: This modification is an editorial change that relocates the proposed exception 2 into the body of the section. Since the charging paragraph doesn't mention noncombustible materials, it is inappropriate to address them in the exception—there is nothing in the charging paragraph to which the exception applies.

Final Hearing Results

FS182-06/07

AMPC1

Code Change No: FS183-06/07

Original Proposal

Section: 1407.2.4

Proponent: Rick Thornberry, P.E., The Code Consortium, Inc., representing Alcan Composites USA, Inc

Revise as follows:

1406.2.4 Fireblocking. Where the combustible exterior wall covering is furred from the wall and forms a solid surface, the distance between the back of the covering and the wall shall not exceed 1.625 inches (41 mm) ~~and~~ Where required by Section 717, the space thereby created shall be fireblocked ~~in accordance with Section 717.~~

Reason: This is a clarification of the code requirements regarding fireblocking for combustible exterior wall coverings. During the previous code development cycles this section was revised and simplified and the exceptions deleted since the exceptions were already contained in Section 717 Concealed Spaces. They were considered superfluous since Section 717 was referenced in this section that we're proposing to revise. The purpose of this code change is to clearly indicate that the concealed space need only be fireblocked in the combustible exterior wall where Section 717 actually requires it to be so, since there are several cases which are exempt from the requirement based on the exceptions to Section 717.2.6 Architectural Trim. As currently worded, this Section 1406.2.4 could be interpreted to say that regardless of the type of combustible exterior wall covering used, the fireblocking would be required without regard to the exceptions. By restructuring the last part of this section, we believe it makes it much more clear that the concealed space in the combustible exterior wall covering is only required to be fireblocked where specifically required by Section 717. Because 717.2.6 contains exceptions to the fireblocking requirement for concealed spaces of exterior wall finish, then for those conditions fireblocking would not be triggered by Section 1406.2.4. That was certainly the intent of the rewrite of the section during the last set of code development cycles between the 2003 International Building Code (IBC) and the 2006 IBC.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The proposal provides for a clarification of the code requirements. Because Section 717 does contain exceptions which may be applicable to this situation, it does seem to be better to state ~~Where required by~~ ^{as} as this proposal does.

Assembly Action:

None

Final Hearing Results

FS183-06/07

AS

Code Change No: **FS185-06/07**

Original Proposal

Section: 1502.1

Proponent: Mark S. Graham, James R. Kirby, National Roofing Contractors Association

Add new definition as follows:

1502.1 General. The following words and terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

AGGREGATE: In roofing, crushed stone, crushed slag or water-worn gravel used for surfacing a built-up roof covering or modified bitumen roof covering.

Reason: This proposed code change adds a new definition to the code.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Modified

Modify proposal as follows:

AGGREGATE: In roofing, crushed stone, crushed slag or water-worn gravel used for surfacing a built-up for roof coverings or modified bitumen roof covering.

Committee Reason: The definition will provide a concise explanation of the term aggregate. The modification removed references to specific types of roof coverings to address the concern that, as written, the definition would not apply to single ply roof coverings.

Assembly Action:

None

Final Hearing Results

FS185-06/07

AM

Code Change No: **FS186-06/07**

Original Proposal

Section: 1502 (New), Chapter 35

Proponent: David L. Roodvoets, DLR Consultants, representing Single-ply Roofing Institute, Inc. (SPRI)

1. Add new definition as follows:

BALLAST: Ballast is any item having weight that is used to hold or steady an object. In roofing, ballast comes in the form of Large Stones (ASTM D448 #4 or larger) or paver systems or light-weight interlocking paver systems and is used to provide uplift resistance for roofing systems that are not adhered or mechanically attached to the roof deck.

2. Add standard to Chapter 35 as follows:**ASTM**D448-03a Standard Classification for Sizes of Aggregate for Road and Bridge Construction

Reason: This addition to the code provides a definition that segregates ballast materials used for wind uplift resistance from other aggregates used on roofs.

There is no definition given for ballast in the standard therefore causing confusion for users of the code between the materials used to provide wind uplift on roofs and smaller aggregate that is used on adhered roofing systems to add fire and weather protection.

The term ballasted was adopted by the roofing industry in the 1970's to describe the use of large stones or pavers to provide wind resistance for roofing systems that were not adhered to the deck. These systems have had extensive use for over 25 years, and have had extensive wind tunnel testing and field evaluations, as well as an excellent track record for performance in high winds.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Note: The following analysis was not in the Code Change Proposal book but was published in the "Errata to the 2006/2007 Proposed Changes to the International Codes and Analysis of Proposed Referenced Standards" provided at the code development hearing.

Analysis: Review of proposed new standard indicated that, in the opinion of staff, the standard did comply with ICC standards criteria

Committee Action:**Approved as Modified****Modify proposal as follows:**

BALLAST: Ballast is any item having weight that is used to hold or steady an object. In roofing, ballast comes in the form of Large aggregate Stones (ASTM D448 #4 or larger) or paver systems or light-weight interlocking paver systems and is used to provide uplift resistance for roofing systems that are not adhered or mechanically attached to the roof deck.

Chapter 35:**ASTM**~~D448-03a Standard Classification for Sizes of Aggregate for Road and Bridge Construction~~

Committee Reason: The definition of ballast will help code users differentiate between aggregate used for wind uplift resistance versus other aggregate roofs. The modification changes "stone" to aggregate for consistency with the changes made in FS186-06/07.

Assembly Action:**None**

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

David L. Roodvoets, DLR Consultants, representing Single-ply Roofing Institute, Inc. (SPRI), requests Approval as Modified by this public comment.

Further modify proposal as follows:

BALLAST: Ballast is any item having weight that is used to hold or steady an object. In roofing, ballast comes in the form of large stones aggregate or paver systems or light-weight interlocking paver systems, and is used to provide uplift resistance for roofing systems that are not adhered or mechanically attached to the roof deck.

Commenter's Reason: The wording as modified by the committee could allow the use of aggregate which can be as small as ¼" in diameter. Although the very small stone is not likely to be dangerous in itself it can be blown off the roof and be a source of debris in windstorms. The proposed modification is a more precise definition and the minimum size stone can be easily observed by an inspector.

Final Hearing Results

FS186-06/07

AMPC1

Code Change No: FS187-06/07**Original Proposal**

Sections: 1503.4, 1503.4.1 (New), 1503.4.2 (New), 1503.4.3 (New), 1611.1

Proponent: Daniel J. Walker, P.E., Metal Building Manufacturers Association, Inc. (MBMA)

1. Revise as follows:

[P] 1503.4 Roof drainage. Design and installation of roof drainage systems shall comply with Section 1503 and the International Plumbing Code.

1503.4.1 Roof design. Roofs shall be designed for the maximum possible depth of water that will pond thereon as determined by the relative levels of roof deck and overflow weirs, scuppers, edges or serviceable drains in combination with the deflected structural elements. In determining the maximum possible depth of water, all primary roof drainage means shall be assumed to be blocked.

1503.4.2 Secondary drainage required. Secondary (emergency) roof drains or scuppers shall be provided where the roof perimeter construction extends above the roof in such a manner that water will be entrapped if the primary drains allow buildup for any reason.

1503.4.3 Scuppers. When scuppers are used for secondary (emergency overflow) roof drainage, the quantity, size, location and inlet elevation of the scuppers shall be sized to prevent the depth of ponding water from exceeding that for which the roof was designed as determined by Section 1503.4.1. Scuppers shall not have an opening dimension of less than 4 inches (102 mm). The flow through the primary system shall not be considered when locating and sizing scuppers.

(Renumber subsequent sections)

2. Revise as follows:

1611.1 Design rain loads. Each portion of a roof shall be designed to sustain the load of rainwater that will accumulate on it if the primary drainage system for that portion is blocked plus the uniform load caused by water that rises above the inlet of the secondary drainage system at its design flow. The design rainfall shall be based on the 100-year hourly rainfall rate indicated in Figure 1611.1 or on other rainfall rates determined from approved local weather data.

3. Insert figure as shown:

Insert all of IPC Figure 1106.1 and renumber as shown



FIGURE 1611.1 IPC-1106.1
100-YEAR, 1-HOUR RAINFALL (INCHES) EASTERN UNITED STATES

For SI: 1 inch = 25.4 mm.

Source: National Weather Service, National Oceanic and Atmospheric Administration, Washington D.C.

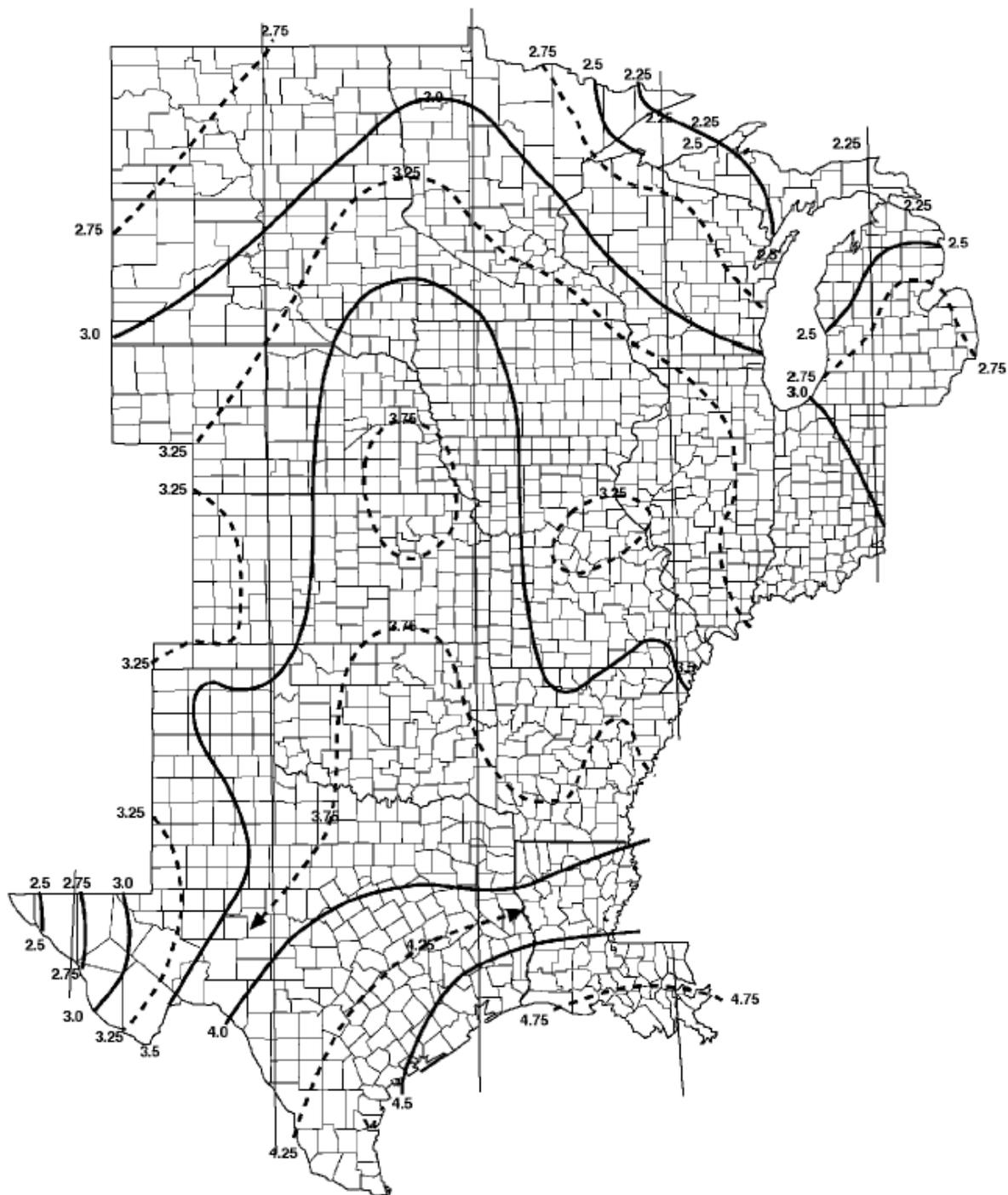


FIGURE 1611.1 IPC1106.1—continued
100-YEAR, 1-HOUR RAINFALL (INCHES) CENTRAL UNITED STATES

For SI: 1 inch = 25.4 mm.

Source: National Weather Service, National Oceanic and Atmospheric Administration, Washington D.C.

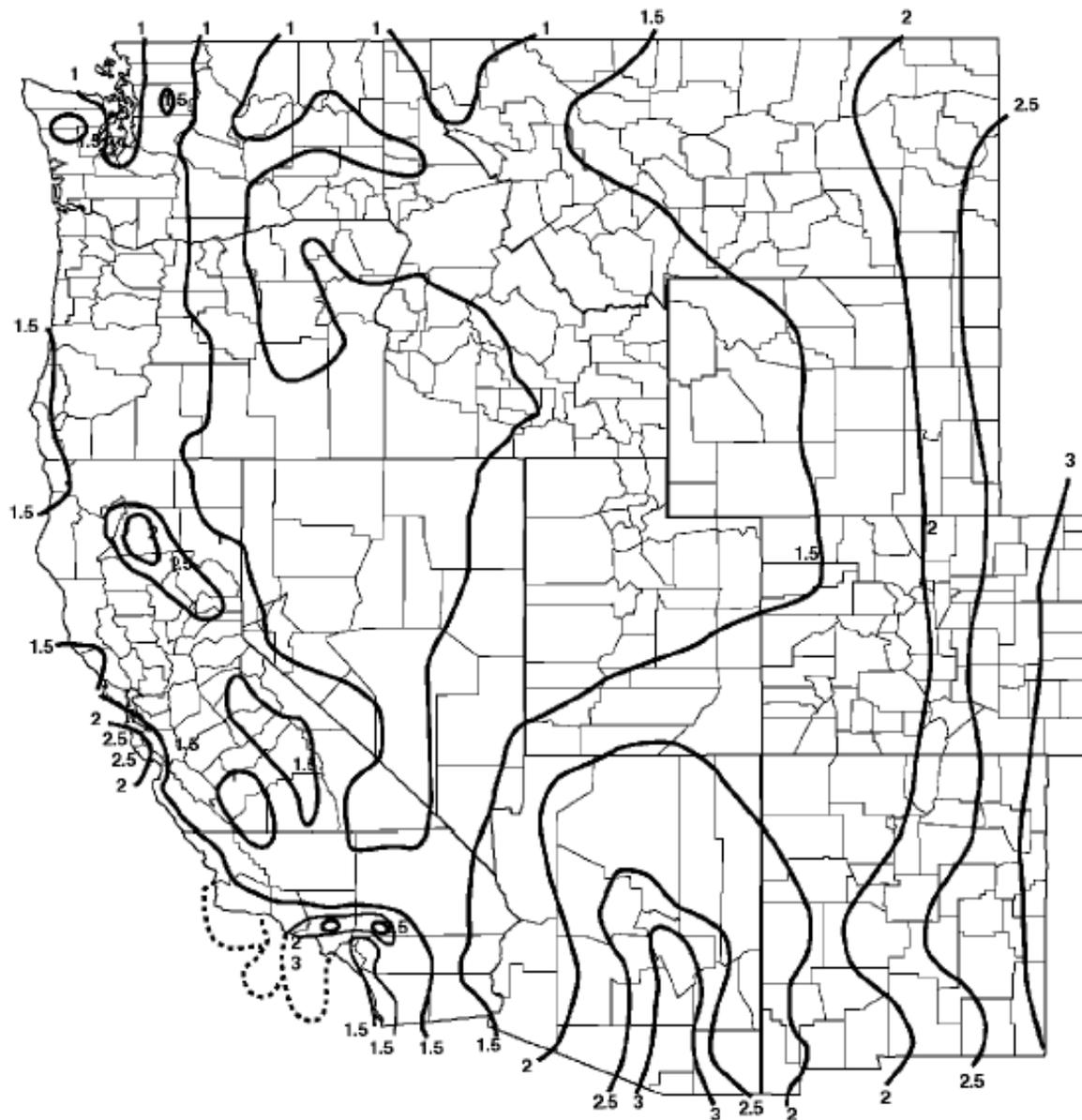


FIGURE 1611.1 IPC1106.1—continued
100-YEAR, 1-HOUR RAINFALL (INCHES) WESTERN UNITED STATES

For SI: 1 inch = 25.4 mm.

Source: National Weather Service, National Oceanic and Atmospheric Administration, Washington D.C.

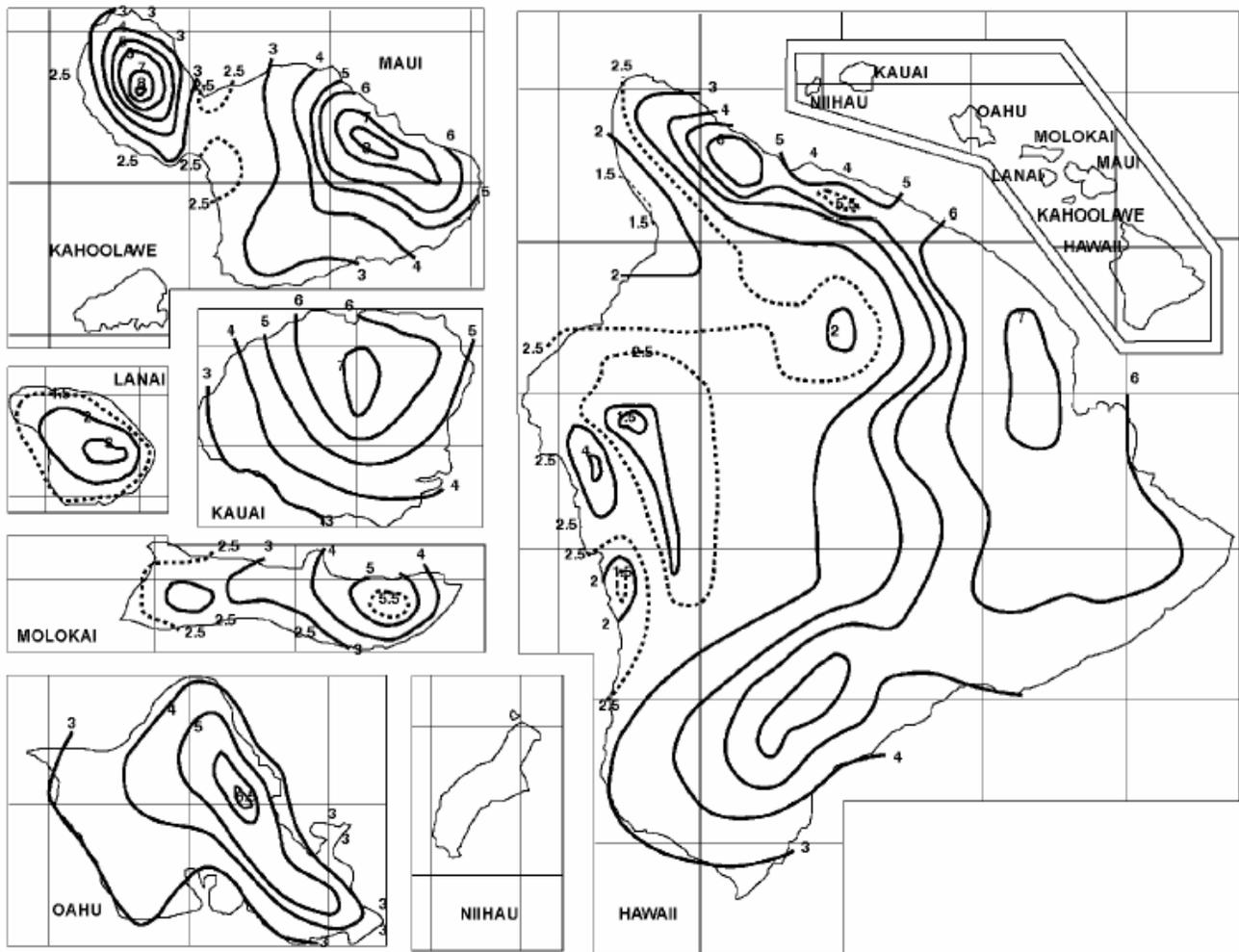


FIGURE 1611.1 IPC1106.1—continued
100-YEAR, 1-HOUR RAINFALL (INCHES) HAWAII

For SI: 1 inch = 25.4 mm.

Source: National Weather Service, National Oceanic and Atmospheric Administration, Washington D.C.

Reason: To make the code more user friendly and to make sure that the structural designer is aware of these design requirements that currently only reside in the IPC.

This code change proposal copies the pertinent roof drainage requirements contained in International Plumbing Code (IPC) Chapter 11 into Chapter 15 of the International Building Code (IBC) to make it more readily available to designers who are responsible for the structural load carrying capacity of roofs. This code change also adds verbiage from the IPC to IBC Section 1611.1 for determining the design rainfall, and copies the rainfall intensity map found in the IPC (Figure 1106.1). Currently this information is only available in the International Plumbing Code.

Section 8.3 of ASCE 7 and IBC Section 1611.1 both state that "Each portion of a roof shall be designed to sustain the load of all rainwater that will accumulate on it if the primary drainage system for that portion is blocked plus the uniform load caused by water that rises above the inlet of the secondary drainage system at its design flow". This code change proposal copies the applicable sections of the IPC into the IBC and puts the information into the hands of those who are responsible for the structural adequacy of the roof for these loads. The design of scuppers as the only secondary roof overflow mechanism is typically the responsibility of the design professional of record, and this information should be copied from the IPC into the IBC to make this information more available. All of the provisions of the IPC will remain, as this proposal suggests only copying the applicable ones into the IBC.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: The text proposed for inclusion into Section 1503.4.1 is from IPC Section 1101.7 and is identical to it. The text proposed for Section 1503.4.2 is from IPC 1107.1 and is identical to it. The text proposed for Section 1503.4.3 is from IPC 1107.3 with modifications since this proposed section only addresses scuppers. The changes that are being made to IPC 1107.3 for the new IBC Section 1503.4.3 are:

IPC 1107.3 Sizing of secondary drains. 1503.4.3 Scuppers. ~~Secondary (emergency) roof drain systems shall be sized in accordance with Section 1106 based on the rainfall rate for which the primary system is sized in Tables 1106.2, 1106.3 and 1106.6. Where scuppers are used for secondary (emergency overflow) roof drainage, the quantity, size, location and inlet elevation of the S scuppers shall be sized to prevent the depth of ponding water from exceeding that for which the roof was designed as determined by Section 1101.7. Scuppers shall not have an opening dimension of less than 4 inches (102 mm). The flow through the primary system shall not be considered when locating and sizing the scuppers secondary roof drain system.~~

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The proposal provides guidance on roof drainage systems that will benefit designers, particularly if the IPC is not adopted.

Assembly Action:

None

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Daniel J. Walker, P.E., Metal Building Manufacturers Association, Inc. (MBMA), requests Approval as Modified by this public comment.

Modify proposal as follows:

~~1503.4.1 Roof design. Roofs shall be designed for the maximum possible depth of water that will pond thereon as determined by the relative levels of roof deck and overflow weirs, scuppers, edges or serviceable drains in combination with the deflected structural elements. In determining the maximum possible depth of water, all primary roof drainage means shall be assumed to be blocked.~~

(Renumber subsequent sections)

(Portions of proposal not shown remain unchanged)

Commenter's Reason: The purpose for the modification is to remove the language for roof design from the original proposal. This specific language is already addressed in both ASCE 7 (Section 8.1) and IBC Chapter 16, Section 1611.1. What we had originally proposed for 1503.4.1 was taken from the International Plumbing Code, but is in conflict with ASCE 7 and IBC. Both ASCE and IBC direct the designer to calculate the rain load using the undeflected shape of the roof, where the plumbing code directs designers to use the deflected shape of the roof. We therefore request that the proposal be modified to be in sync with ASCE 7 Section 8.1 and IBC Section 1611.1 since those are the authoritative source for design information.

Final Hearing Results

FS187-06/07

AMPC1

Code Change No: **FS188-06/07**

Original Proposal

Sections: 1503.6 (New), 1507.2.9.4; IRC R905.2.8.3, R903.2.2 (New)

Proponent: David Fizzell, City of Prescott, Arizona, representing Arizona Building Officials

THIS PROPOSAL IS ON THE AGENDA OF THE IBC-FIRE SAFETY AND THE IRC-BUILDING/ENERGY CODE DEVELOPMENT COMMITTEES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IBC FIRE SAFETY

1. Delete without substitution:

~~**1507.2.9.4 Crickets and saddles.** A cricket or saddle shall be installed on the ridge side of any chimney or penetration greater than 30 inches (762 mm) wide as measured perpendicular to the slope. Cricket or saddle coverings shall be sheet metal or of the same material as the roof covering.~~

2. Add new text as follows:

1503.6 Crickets and saddles. A cricket or saddle shall be installed on the ridge side of any chimney or penetration greater than 30 inches (762 mm) wide as measured perpendicular to the slope. Cricket or saddle coverings shall be sheet metal or of the same material as the roof covering.

PART II S IRC-BUILDING/ENERGY**1. Delete without substitution:**

~~**R905.2.8.3 Crickets and saddles.** A cricket or saddle shall be installed on the ridge side of any chimney or penetration more than 30 inches (762 mm) wide as measured perpendicular to the slope. Cricket or saddle coverings shall be sheet metal or of the same material as the roof covering.~~

2. Add new text as follows:

R903.2.2 Crickets and saddles. A cricket or saddle shall be installed on the ridge side of any chimney or penetration greater than 30 inches (762 mm) wide as measured perpendicular to the slope. Cricket or saddle coverings shall be sheet metal or of the same material as the roof covering.

Reason: Currently this language is located under the requirements for asphalt shingle drip edge. The requirement should not be limited only to asphalt shingle roof coverings. Crickets and saddles are not related to drip edge. These requirements can be applied to all types of roof coverings and need to be located in a section that can be applied to all roofs. An identical code proposal is being presented to the IRC code change committee.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

PART I C IBC FIRE SAFETY**Committee Action:****Approved as Submitted**

Committee Reason: This restores a provision which was accidentally dropped in the last code change cycle. This proposal provides clarification by restoring the provision and moving it to the right section. The provision was previously in the asphalt roofing section and the code concern is a general item which is not material specific.

Assembly Action:**None****PART II C IRC****Committee Action:****Approved as Submitted**

Committee Reason: Appropriately relocates the crickets and saddles requirements to the proper code section to apply to all roof coverings.

Assembly Action:**None**

Final Hearing Results

FS188-06/07, Part I	AS
FS188-06/07, Part II	AS

Code Change No: FS191-06/07

Original Proposal

Sections: 1504.1.1, 1507.2.7 (New), 1507.2.7.1 (New), Table 1507.2.7.1 (New), 1609.5.2, Chapter 35; IRC R905.2.4.1 (New), Table R905.2.4.1 (New), R905.2.6, Chapter 43

Proponent: Michael D. Fischer, The Kellen Company, representing the Asphalt Roofing Manufacturers Association

THIS PROPOSAL IS ON THE AGENDA OF THE IBC-STRUCTURAL AND THE IRC BUILDING/ENERGY CODE DEVELOPMENT COMMITTEES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IBC STRUCTURAL

1. Revise as follows.

1504.1.1 Wind resistance of asphalt shingles. Asphalt shingles shall be installed in accordance with Section 1507.2.7. ~~For roofs located where the basic wind speed in accordance with Figure 1609 is 110 mph or greater, asphalt shingles shall be tested in accordance with ASTM D 3161, Class F. As an alternative, load and wind resistance of asphalt shingle roof coverings shall be determined in accordance with Section 1609.5.2.~~

2. Delete and substitute as follows.

~~**1507.2.7 Attachment.** Asphalt shingles shall have the minimum number of fasteners required by the manufacturer and Section 1504.1. Asphalt shingles shall be secured to the roof with not less than four fasteners per strip shingle or two fasteners per individual shingle. Where the roof slope exceeds 20 units vertical in 12 units horizontal (166-percent slope), asphalt shingles shall be installed in accordance with the manufacturer's printed installation instructions for steep-slope roof applications.~~

1507.2.7 Attachment. Asphalt shingles shall have the minimum number of fasteners required by the manufacturer, but not less than four fasteners per strip shingle or two fasteners per individual shingle. Where the roof slope, exceeds 21 units vertical in 12 units horizontal (21:12), shingles shall be installed as required by the manufacturer.

1507.2.7.1 Wind Resistance. Asphalt shingles shall be tested in accordance with either ASTM D3161 or ASTM D7158 for wind resistance. Asphalt shingles shall meet the classification requirements of Table 1507.2.7 for the appropriate Maximum Basic Wind Speed. Asphalt shingle packaging shall indicate compliance with the required classification in Table 1507.2.7.

3. Add new table as follows:

**TABLE 1507.2.7
CLASSIFICATION OF ASPHALT ROOF SHINGLES ^a**

<u>MAXIMUM BASIC WIND SPEED FROM FIGURE 1609</u>	<u>ASTM D 3161</u>	<u>ASTM D 7158 b</u>
<u>85</u>	<u>A,D, or F</u>	<u>D,G or H</u>
<u>90</u>	<u>A,D, or F</u>	<u>D,G or H</u>
<u>100</u>	<u>A,D, or F</u>	<u>G or H</u>
<u>110</u>	<u>F</u>	<u>G or H</u>
<u>120</u>	<u>F</u>	<u>G or H</u>
<u>130</u>	<u>F</u>	<u>H</u>
<u>140</u>	<u>F</u>	<u>H</u>
<u>150</u>	<u>F</u>	<u>H</u>

- a. Asphalt Shingles shall be tested in accordance with ASTM D 3161 or ASTM D 7158. Refer to this table for selection of the appropriate product classification(s).
- b. The standard calculations contained in ASTM D 7158 assume exposure category B or C and building height of 60 feet or less. Additional calculations are required for conditions outside of these assumptions.

4. Revise as follows:

1609.5 Roof systems.

1609.5.1 Roof deck. The roof deck shall be designed to withstand the wind pressures determined in accordance with ASCE 7.

1609.5.2 Roof coverings. Roof coverings shall comply with Section 1609.5.1.

Exception: Rigid tile roof coverings that are air permeable and installed over a roof deck complying with Section 1609.5.1 are permitted to be designed in accordance with Section 1609.5.3.

~~Asphalt shingles installed over a roof deck complying with Section 1609.5.1 shall be tested to determine the resistance of the sealant to uplift forces using ASTM D 6381.~~

~~Asphalt shingles installed over a roof deck complying with Section 1609.5.1 are permitted to be designed using UL 2390 to determine appropriate uplift and force coefficients applied to the shingle.~~

Asphalt Shingles installed over a roof deck complying with 1609.5.1 shall be permitted to be designed using ASTM D 7158 to determine wind resistance.

5. Add standard to Chapter 35 as follows:

ASTM

D7158-05 Standard Test Method for Wind Resistance of Sealed Asphalt Shingles (Uplift Force/Uplift Resistance Method)

PART II – IRC BUILDING/ENERGY

1. Revise as follows:

R905.2.4.1 Wind resistance of asphalt shingles. Asphalt shingles shall be installed in accordance with Section R905.2.6. ~~Shingles classified using ASTM D 3161 are acceptable for use in wind zones less than 110 mph (49 m/s). Shingles classified using ASTM D 3161, Class F, are acceptable for use in all cases where special fastening is required.~~ Asphalt shingles shall be tested for wind resistance in accordance with one of the following test standards:

1. ASTM D 3161
2. ASTM D 7158

Asphalt shingles shall meet the classification requirement of Table 905.2.4.1 for the applicable maximum basic wind speed. Asphalt shingle packaging shall bear a label to indicate compliance with one of the above ASTM test standards and the appropriate classification from Table 905.2.4.1.

2. Add new table as follows:

**TABLE R905.2.4.1
CLASSIFICATION OF ASPHALT ROOF SHINGLES ^a**

<u>MAXIMUM BASIC WIND SPEED FROM TABLE R301.2(1)</u>	<u>ASTM D 3161</u>	<u>ASTM D 7158 b</u>
<u>85</u>	<u>A,D, or F</u>	<u>D,G or H</u>
<u>90</u>	<u>A,D, or F</u>	<u>D,G or H</u>
<u>100</u>	<u>A,D, or F</u>	<u>G or H</u>
<u>110</u>	<u>F</u>	<u>G or H</u>
<u>120</u>	<u>F</u>	<u>G or H</u>
<u>130</u>	<u>F</u>	<u>H</u>
<u>140</u>	<u>F</u>	<u>H</u>
<u>150</u>	<u>F</u>	<u>H</u>

- a. Asphalt Shingles shall be tested in accordance with ASTM D 3161 or ASTM D 7158. Refer to this table for selection of the appropriate product classification(s).
- b. The standard calculations contained in ASTM D 7158 assume exposure category B or C and building height of 60 feet or less. Additional calculations are required for conditions outside of these assumptions.

3. Revise as follows.

R905.2.6 Attachment. ~~Asphalt shingles shall have the minimum number of fasteners required by the manufacturer, but not less than four fasteners per strip shingle or two fasteners per individual shingle. For normal application, asphalt shingles shall be secured to the roof with not less than four fasteners per strip shingle or two fasteners per individual shingle. Where the roof slope exceeds 20 21 units vertical in 12 units horizontal (467 21:12, 175 percent slope), shingles shall be installed as required by the manufacturer. special methods of fastening are required. For roofs located where the basic wind speed per Figure 301.2(4) is 110 mph (49 m/s) or higher, special methods of fastening are required. Special fastening methods shall be tested in accordance with ASTM D 3161 Class F. Asphalt shingle wrappers shall bear a label indicating compliance with ASTM D 3161 Class F.~~

4. Add standard to Chapter 43 as follows:

ASTM

D7158-05 Standard Test Method for Wind Resistance of Sealed Asphalt Shingles (Uplift Force/Uplift Resistance Method)

Reason: This proposal will revise requirements for the testing of asphalt shingles to demonstrate resistance to wind forces, and provide clarifications to the attachment requirements for steep slope conditions. The IBC and IRC lack a reference to ASTM D 7158, which provides a method of testing that is appropriate for sealed asphalt shingles. The current reference to ASTM D 3161 is necessary for unsealed shingles, so that reference remains in this proposal. In order to clearly communicate the proper application of the two standards, the proponent is adding Table 1507.2.7 (IRC Table 905.2.4.1). The table will assist in the proper selection of asphalt shingles based upon the appropriate basic wind speed and the applicable standard.

Changes in the attachment section provide consistency with the industry installation guidelines, but continue to provide minimum fastener quantities. Reformatting the code sections provides a clear line of compliance. The shingle shall be tested, labeled, selected, and attached, and the code will now follow that sequence in the requirements.

The referenced standard has been accepted by the Florida Building Commission Structural TAC, for adoption into the Florida Building Code and Florida Building Code Residential. The clarification to Section 1609.5.2 provides consistency to the reference of ASTM D 7158.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Note: The following analysis was not in the Code Change Proposal book but was published in the AErrata to the 2006/2007 Proposed Changes to the International Codes and Analysis of Proposed Referenced Standards® provided at the code development hearings:

Analysis: Review of proposed new standard indicated that, in the opinion of staff, the standard did comply with ICC standards criteria. (Reviewed 2006 year date)

PART I C IBC STRUCTURAL**Committee Action:****Approved as Modified**

Modify the proposal as follows:

Chapter 35**ASTM**D7158- ~~05~~ 06 Standard Test Method for Wind Resistance of Sealed Asphalt Shingles (Uplift Force/Uplift Resistance Method)

Committee Reason: This proposal clarifies the attachment and determination of wind resistance of asphalt shingles. The added standard provides for testing of sealed asphalt shingles. The modification merely changes the edition of the standard to agree with what was submitted for committee review.

Assembly Action:**None****PART II C IRC****Committee Action:****Approved as Modified**

Modify the proposal as follows:

4. Add standard to Chapter 43 as follows:**ASTM**D7158-~~05~~ 06 Standard Test Method for Wind Resistance of Sealed Asphalt Shingles (Uplift Force/Uplift Resistance Method)

(Portions of proposal not shown remain unchanged)

Committee Reason: Based on proponent's published reason. The modification updates the reference standard to the current edition.

Assembly Action:**None**

Final Hearing Results

FS191-06/07, Part I	AM
FS191-06/07, Part II	AM

Code Change No: FS192-06/07

Original Proposal

Sections: 1504.2, 1504.3, 1504.8 and Table 1508.4**Proponent:** Philip Brazil, P.E., Reid Middleton, Inc., representing himself

THIS PROPOSAL IS ON THE AGENDA OF THE STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THAT COMMITTEE.

Revise as follows:

1504.2 Wind resistance of clay and concrete tile. Wind loads on G clay and concrete tile roof coverings shall be ~~connected to the roof deck~~ in accordance with ~~Chapter 16~~ Section 1609.5.

1504.3 Wind resistance of nonballasted roofs. Roof coverings installed on roofs in accordance with Section 1507 that are mechanically attached or adhered to the roof deck shall be designed to resist the design wind load pressures for components and cladding in ~~Chapter 16~~ accordance with Section 1609.

1504.8 Gravel and stone. Gravel or stone shall not be used on the roof of a building located in a hurricane-prone region as defined in Section 1609.2, or on any other building with a mean roof height exceeding that permitted by Table 1504.8 based on the exposure category and basic wind speed at the ~~building~~ site.

**TABLE 1504.8
MAXIMUM ALLOWABLE MEAN ROOF HEIGHT PERMITTED FOR BUILDINGS
WITH GRAVEL OR STONE ON THE ROOF IN AREAS OUTSIDE A HURRICANE-PRONE REGION**

BASIC WIND SPEED FROM FIGURE 1609 (mph) ^b	MAXIMUM MEAN ROOF HEIGHT (ft) ^{a,c}		
	Exposure category		
	B	C	D
85	170	60	30
90	110	35	15
95	75	20	NP
100	55	15	NP
105	40	NP	NP
110	30	NP	NP
115	20	NP	NP
120	15	NP	NP
Greater than 120	NP	NP	NP

For SI: 1 foot = 304.8 mm; 1 mile per hour = 0.447 m/s.

- a. Mean roof height in accordance with Section 1609.2 as defined in ASCE 7.
- b. For intermediate values of basic wind speed, the height associated with the next higher value of wind speed shall be used, or direct interpolation is permitted.
- c. NP = gravel and stone not permitted for any roof height.

Reason: The purpose for the proposal is to update the provisions of Section 1504 on performance requirements for roof decks and roof covering to be more consistent with current structural provisions in Chapter 16. Section 1504.2 on clay and concrete tile roof coverings is revised from a requirement to be connected in accordance with Chapter 16 to a determination of wind loads in accordance with Section 1609.5 because the only identified reference to clay and concrete tile roof coverings in Chapter 16 is in Section 1609.5, which specifies how to determine wind loads (Section 1609.5.3) and wind pressures (Section 1609.5.1) but does not specify required connections.

Section 1609.5.1 requires the roof deck to be designed to withstand the wind pressures determined in accordance with ASCE 7. Section 1609.5.2 requires roof coverings to comply with Section 1609.5.1 except for rigid tile roof coverings that are air permeable and installed over a roof deck complying with Section 1609.5.1, which are permitted to comply with Section 1609.5.3.

A change to the title of Section 1504.2 is not proposed in order to maintain consistency with the titles to Sections 1504.1 (wind resistance of roofs) and 1504.3 (wind resistance of ballasted roofs), and with the subject of Section 1504.2.1, which refers to the resistance of shingles to uplift forces.

The proposed changes to Section 1504.3 are editorial. The deletion of “building” from Section 1504.8 is being done because the provisions of the IBC apply to structures as well as buildings. The revision to Footnote (a) of Table 1504.8 is being done because Section 1609.2 does not define mean roof height but that definition is found in Section 6.2 of ASCE 7-05.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The proposal provides better coordination between the roof covering wind requirements in Section 1504 and Chapter 16 wind load requirements.

Assembly Action:

None

Final Hearing Results

FS192-06/07

AS

Code Change No: **FS196-06/07**

Original Proposal

Section: 1504.4

Proponent: David L. Roodvoets, DLR Consultants, representing Single-ply Roofing Institute, Inc. (SPRI)

Revise as follows:

1504.4 Ballasted low-slope roof systems. Ballasted low-slope (roof slope < 2:12) single-ply roof system coverings installed in accordance with Sections ~~4507~~ 1507.12 and 1507.13 shall be designed in accordance with ~~Section 1504.8 and~~ ANSI/SPRI RP-4.

Reason: Clarify which specific sections in 1507 - Requirements for Roof Coverings, involve low slope Ballasted systems and that the ballast used is large stone.

There is confusion by users of the code between the materials used to provide wind uplift on roofs and smaller aggregate that is used on adhered roofing systems to add fire and weather protection.

Ballasted single ply membranes performed very well in the recent hurricanes, see examples from the RICOWI report, again verifying that ANSI/SPRI RP-4 provides the design tools to install roofing systems that meet the required design. This change clearly separates the requirements for systems that use ballast for wind resistance from those systems that use smaller aggregate for fire and weather protection.

2.02 West Florida Hospital, East Patient Hospital, 8383 N. Davis Highway, Pensacola

TYPE OF STRUCTURE—Hospital
EXPOSURE—B
WALL CONSTRUCTION—Concrete with EIFS cladding
ROOF TYPE—Single-ply membrane
ROOF PITCH—¼ " : 12
ROOF DECK—Cast-in-place concrete

CONSTRUCTION—The building is one of many on the site and is constructed mostly of substantial steel frame construction with original rock aggregate precast concrete exterior panels that had been retrofitted with an EIFS exterior cladding system. The roof deck, which is about 30 ft above grade, appears to be cast-in-place concrete. This roof has a gravel stop edge.

The Escambia inlet bay could be seen to the east and south from the roofs, yet the surrounding terrain would qualify as Exposure B, according to ASCE 7-02, with a height of surface roughness of about 25 to 30 ft above grade. Streets and parking lots create open areas on the east, northeast, south, and southeast side of the structure across the street, as well as adjacent to the structure.

ROOF MEMBRANE SYSTEM—The membrane was a loose-laid ballasted white reinforced elastomeric sheet single-ply membrane (Hypalon), The ballast was similar to ASTM 448 #4 or larger (average 1.5-in. with stones up to 2 in.) The membrane was installed over tapered Isocyanurate insulation.

DAMAGE CONDITIONS—No membrane damage was noted. There was a small amount of gravel scour at the windward side, at corners, and around penthouses. There were no signs that gravel had left the roof. Ballast scour may occur, based on previous wind studies, for winds over 115 mph at this building height. Some of the partially adhered, 1/2-in.-thick rubber walk pads had become loose from the membrane; some may have blown off the roof. A 30 to 40 ft segment of the snap on fascia edge metal cover become disengaged from its cleat and had blown off. An exhaust fan had also blown off the roof.

DAMAGE INITIATION—The shop-fabricated metal edge was clamped over an existing gravel stop. The cleat, although continuous, was thin and could not resist the bending forces of the fascia.

OTHER COMMENTS —This roof was a survivor. There were no known leaks, and the ballast remained on the roof. The damage to the edge was repairable. The section of the hospital had been closed because the windows in the east-facing wall leaked so badly that water was blowing into the patient rooms. They expected to have the area back in operation as soon as the rooms were dried out.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Modified

Modify proposal as follows:

1504.4 Ballasted low-slope roof systems. Ballasted low-slope (roof slope < 2:12) single-ply roof system coverings installed in accordance with Sections 1507.12 and 1507.13 shall be designed in accordance with Section 1504.8 and ANSI/SPRI RP-4.

Committee Reason: The proposal clarifies the installation of ballasted low-slope roof systems by providing more specific section references. The modification retains the reference to Section 1504.8 for design because no reason was given to justify removing it.

Assembly Action:

None

Final Hearing Results

FS196-06/07

AM

Code Change No: **FS198-06/07**

Original Proposal

Section: 1504.8, Table 1504.8

Proponent: Mark S. Graham, James R. Kirby, National Roofing Contractors Association

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THIS COMMITTEE.

Revise as follows:

1504.8 Gravel and stone. Aggregate. ~~Gravel or stone~~ Aggregate shall not be used on the roof of a building located in a hurricane-prone region as defined in Section 1609.2, or on any other building with a mean roof height exceeding that permitted by Table 1504.8 based on the exposure category and basic wind speed at the building site.

**TABLE 1504.8
MAXIMUM ALLOWABLE MEAN ROOF HEIGHT PERMITTED FOR
BUILDINGS WITH ~~GRAVEL OR STONE~~ AGGREGATE ON THE ROOF IN AREAS
OUTSIDE A HURRICANE-PRONE REGION**

(No changes to table text)

Reason: This proposed code change is intended to clarify the intent of Section 1504.8. The terms "gravel and stone" are not used elsewhere in Chapter 15. The term "aggregate" is already used in Table 1507.10.2.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: Substituting the term Aggregate® for Agravel and stone® clarifies these roof covering provisions.

Assembly Action:

None

Final Hearing Results

FS198-06/07

AS

Code Change No: **FS199-06/07**

Original Proposal

Sections: 1505.2, 1505.3; IRC R902.1

Proponent: John C. Dean, The National Association of State Fire Marshals

THIS PROPOSAL IS ON THE AGENDA OF THE IBC-FS AND THE IRC BUILDING/ENERGY CODE DEVELOPMENT COMMITTEES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IBC FIRE SAFETY

Revise as follows:

1505.2 Class A roof assemblies. Class A roof assemblies are those that are effective against severe fire test exposure. Class A roof assemblies and roof coverings shall be listed and identified as Class A by an approved testing agency. Class A roof assemblies shall be permitted for use in buildings or structures of all types of construction.

Exception: Class A roof assemblies include those with coverings of brick, masonry, slate, clay or concrete roof tile, or exposed concrete roof deck, ~~ferrous or copper shingles or sheets.~~

1505.3 Class B roof assemblies. Class B roof assemblies are those that are effective against moderate fire-test exposure. Class B roof assemblies and roof coverings shall be listed and identified as Class B by an approved testing agency.

~~**Exception:** Class B roof assemblies include those with coverings of metal sheets and shingles.~~

PART II – IRC BUILDING/ENERGY

Revise as follows:

R902.1 Roofing covering materials. Roofs shall be covered with materials as set forth in Sections R904 and R905. Class A, B or C roofing shall be installed in areas designated by law as requiring their use or when the edge of the roof is less than 3 feet (914 mm) from a property line. Classes A, B and C roofing required to be listed by this section shall be tested in accordance with UL 790 or ASTM E 108. Roof assemblies with coverings of brick, masonry, slate, clay or concrete roof tile, or exposed concrete roof deck, ~~ferrous or copper shingles or sheets, and metal sheets and shingles,~~ shall be considered Class A roof coverings.

Reason: All roof assemblies with metal roof covering should be tested in accordance with ASTM E 108 or UL 790. The increasingly wide range of materials and configurations used as metal roofing now available in the market can no longer support a general exemption from fire testing these assemblies.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing Results

PART I C IBC FIRE SAFETY

Committee Action:

Disapproved

Committee Reason: This would be a substantial change which would remove a provision which was permitted by all three legacy codes. This issue was debated during the IBC development and since then and has been disapproved because structures with steel roofs do have a good fire history. While there are new materials being introduced, they still are required to meet the material standards of Section 1507.4.3 and Table 1507.3(1). If there is a problem with a new material then those products should be addressed without creating a prohibition against a product without a history of problems. The proposal lacked technical support.

Assembly Action:

None

PART II C IRC

Committee Action:

Disapproved

Committee Reason: There was no technical data submitted to show that the current code language is inadequate.

Assembly Action:

None

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

John C. Dean, The National Association of State Fire Marshals, requests Approval as Modified by this public comment for Part I.

Modify proposal as follows:

1505.2 Class A roof assemblies. Class A roof assemblies are those that are effective against severe fire test exposure. Class A roof assemblies and roof coverings shall be listed and identified as Class A by any approved testing agency. Class A roof assemblies shall be permitted for use in buildings or structures of all types of construction.

Exceptions:

1. Class A roof assemblies include those with coverings of brick, masonry, slate, clay or concrete roof tile, or and exposed concrete roof deck.
2. Class A roof assemblies also include ferrous or copper shingles or sheets, installed on non-combustible decks.

1505.3 Class B roof assemblies. Class B roof assemblies are those that are effective against moderate fire-test exposure. Class B roof assemblies and roof coverings shall be listed and identified as Class B by an approved testing agency.

Commenter's Reason: These proposals were mischaracterized by the committee as eliminating the use of products that have previously been acceptable. In fact, the proposal makes no such assertion. The proposals only seek to remove language and exceptions that automatically confer Class A or Class B status to certain materials. The increasingly wide range of materials and configurations used as metal roofing now available in the market can no longer support a general exemption from fire testing these assemblies. All roof assemblies with metal roof covering should be tested in accordance with ASTM E108 or UL 790. The modification recognizes that metal roof coverings on non-combustible decks do not constitute a hazard.

In addition, these proposals will remove discrepancies between the IBC and IRC. In Section 902.1 of the IRC it confers Class A status to metal and copper materials. Section 1505.2 and 1505.3 of the IBC, copper is considered Class A, and metal is considered Class B. The same roofing material would have a different rating in each code. Revising the language and exceptions will provide clarification and consistency throughout the ICC documents.

The committee also indicated that they were unaware of data that suggests the exceptions are not warranted. Representative roofing material was tested on January 10, 2007i. These materials were subjected to the Burning Brand test in accordance with the ANSI/UL790 (Eighth Edition) standard. The test decks were constructed in accordance with paragraph 4.2, roof covering material applied in accordance with paragraph 4.4, and test samples conditioned in accordance with paragraph 4.5. The test decks were constructed using 15/32 seconds plywood in accordance with UL790. Testing was conducted in the UL lab and photo and video documentation were recorded. All tests were conducted using ASTM D226 Type 1 underlayment. Sustained flaming of the underside of the deck, indicating test FAILURE, occurred as follows:

- 30 gauge steel shingle – Class A test: Failed in 3 minutes 9 seconds.
- 0.040 Aluminum panel – Class B test: Failed in 7 minutes 39 seconds
- 24 gauge steel sheet – Class A test: Failed in 10 minutes 25 seconds
- Slate shingle 14X10 - Class A test: Failed 14 minutes 29 seconds.

These results are significant for several reasons. 1. The representative tests substantiate the original proposals as they certainly create a doubt that the automatic classification afforded by the codes is appropriate, 2. The tests indicate that sustained burning would occur in the attic space of buildings, in many cases before local fire departments could respond, and 3. Roof covering systems should be rated, not just the covering material.

In the document entitled *Roofing Materials & Systems Directory*, 2006 Edition, UL defines the roof system requirements for the various classifications. Most Class A ratings require the use of an additional layer of protection. With the automatic classifications now allowed by the code, it is creating a false sense of safety.

i "Report on Fact-Finding Investigation of Metal and Slate Prepared Roof Coverings". UL Report: Project 07CA03538/ File SV16680. January 2007.

Public Comment:

John C. Dean, The National Association of State Fire Marshals , requests Approval as Modified by this public comment for Part II.

Modify proposal as follows:

R902.1 Roofing covering materials. Roofs shall be covered with materials as set forth in Sections R904 and R905. Class A, B or C roofing shall be installed in areas designated by law as requiring their use or when the edge of the roof is less than 3 feet (914 mm) from a property line. Classes A, B and C roofing required to be listed by this section shall be tested in accordance with UL790 or ASTM E 108. ~~Roof assemblies with coverings of brick, masonry, slate, clay or concrete roof tile, or exposed concrete roof deck shall be considered Class A roof coverings.~~

Exceptions:

1. Class A roof assemblies include those with coverings of brick, masonry, slate, clay or concrete roof tile, and exposed concrete roof deck.
2. Class A roof assemblies also include ferrous or copper shingles or sheets, metal sheets and shingles, installed on noncombustible decks.

Commenter's Reason: These proposals were mischaracterized by the committee as eliminating the use of products that have previously been acceptable. In fact, the proposal makes no such assertion. The proposals only seek to remove language and exceptions that automatically confer Class A or Class B status to certain materials. The increasingly wide range of materials and configurations used as metal roofing now available in the market can no longer support a general exemption from fire testing these assemblies. All roof assemblies with metal roof covering should be tested in accordance with ASTM E108 or UL 790. The modification recognizes that metal roof coverings on non-combustible decks do not constitute a hazard.

In addition, these proposals will remove discrepancies between the IBC and IRC. In Section 902.1 of the IRC it confers Class A status to metal and copper materials. Section 1505.2 and 1505.3 of the IBC, copper is considered Class A, and metal is considered Class B. The same roofing material would have a different rating in each code. Revising the language and exceptions will provide clarification and consistency throughout the ICC documents.

The committee also indicated that they were unaware of data that suggests the exceptions are not warranted. Representative roofing material was tested on January 10, 2007ⁱ. These materials were subjected to the Burning Brand test in accordance with the ANSI/UL790 (Eighth Edition) standard. The test decks were constructed in accordance with paragraph 4.2, roof covering material applied in accordance with paragraph 4.4, and test samples conditioned in accordance with paragraph 4.5. The test decks were constructed using 15/32 seconds plywood in accordance with UL790. Testing was conducted in the UL lab and photo and video documentation were recorded. All tests were conducted using ASTM D226 Type 1 underlayment. Sustained flaming of the underside of the deck, indicating test FAILURE, occurred as follows:

30 gauge steel shingle – Class A test: Failed in 3 minutes 9 seconds.
 0.040 Aluminum panel – Class B test: Failed in 7 minutes 39 seconds
 24 gauge steel sheet – Class A test: Failed in 10 minutes 25 seconds
 Slate shingle 14X10 - Class A test: Failed 14 minutes 29 seconds.

These results are significant for several reasons. 1. The representative tests substantiate the original proposals as they certainly create a doubt that the automatic classification afforded by the codes is appropriate, 2. The tests indicate that sustained burning would occur in the attic space of buildings, in many cases before local fire departments could respond, and 3. Roof covering systems should be rated, not just the covering material.

In the document entitled *Roofing Materials & Systems Directory*, 2006 Edition, UL defines the roof system requirements for the various classifications. Most Class A ratings require the use of an additional layer of protection. With the automatic classifications now allowed by the code, it is creating a false sense of safety.

ⁱ "Report on Fact-Finding Investigation of Metal and Slate Prepared Roof Coverings". UL Report: Project 07CA03538/ File SV16680. January 2007.

Final Hearing Results

FS199-06/07, Part I	AMPC1
FS199-06/07, Part II	AMPC1

Code Change No: FS200-06/07

Original Proposal

Sections: 1507.2.8.2, 1507.5.3, 1507.6.3, 1507.7.3, Table 1507.8, 1507.8.3 and 1507.9.3

Proponent: Lawrence Brown, CBO, National Association of Home Builders (NAHB)

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THAT COMMITTEE.

Revise as follows:

1507.2.8.2 Ice dam membrane barrier. In areas where there has been a history of ice forming along the eaves causing a backup of water, ~~a membrane~~ an ice barrier that consists of at least two layers of underlayment cemented together or of a self-adhering polymer modified bitumen sheet shall be used in lieu of normal underlayment and extend from the ~~eave's edge~~ lowest edges of all roof surfaces to a point at least 24 inches (610 mm) inside the exterior wall line of the building.

Exception: Detached accessory structures that contain no conditioned floor area.

1507.5.3 Underlayment. Underlayment shall comply with ASTM D226, Type I or ASTM D4869.

1507.5.4 Ice barrier. In areas where there has been a history of ice forming along the eaves causing a backup of water, an ice barrier that consists of at least two layers of underlayment cemented together or of a self-adhering polymer-modified bitumen sheet shall be used in lieu of normal underlayment and extend from the ~~eave's edge~~ lowest edges of all roof surfaces to a point at least 24 inches (610 mm) inside the exterior wall line of the building.

Exception: Detached accessory structures that contain no conditioned floor area.

(Renumber subsequent sections)

1507.6.3 Underlayment. Underlayment shall comply with ASTM D226, Type I or ASTM D4869.

1507.6.4 Ice barrier. In areas where there has been a history of ice forming along the eaves causing a backup of water, an ice barrier that consists of at least two layers of underlayment cemented together or of a self-adhering polymer-modified bitumen sheet shall be used in lieu of normal underlayment and extend from the ~~eave's edge~~ lowest edges of all roof surfaces to a point at least 24 inches (610 mm) inside the exterior wall line of the building.

Exception: Detached accessory structures that contain no conditioned floor area.

(Renumber subsequent sections)

1507.7.3 Underlayment. Underlayment shall comply with ASTM D 226, Type I or ASTM D 4869.

1507.7.4 Ice barrier. In areas where the average daily temperature in January is 25 °F (-4 °C) or less or where there is a possibility of ice forming along the eaves causing a backup of water, an ice barrier that consists of at least two layers of underlayment cemented together or of a self-adhering polymer-modified bitumen sheet shall extend from the ~~eave's edge~~ lowest edges of all roof surfaces to a point at least 24 inches (610 mm) inside the exterior wall line of the building.

Exception: Detached accessory structures that contain no conditioned floor area.

(Renumber subsequent sections)

1507.8.3 Underlayment. Underlayment shall comply with ASTM D226, Type I or ASTM D4869.

1507.8.4 Ice barrier. In areas where there has been a history of ice forming along the eaves causing a backup of water, an ice barrier that consists of at least two layers of underlayment cemented together or of a self-adhering polymer-modified bitumen sheet shall be used in lieu of normal underlayment and extend from the ~~eave's edge~~ lowest edges of all roof surfaces to a point at least 24 inches (610 mm) inside the exterior wall line of the building.

Exception: Detached accessory structures that contain no conditioned floor area.

(Renumber subsequent sections)

1507.9.3 Underlayment. Underlayment shall comply with ASTM D226, Type I or ASTM D4869.

1507.9.4 Ice barrier. In areas where there has been a history of ice forming along the eaves causing a backup of water, an ice barrier that consists of at least two layers of underlayment cemented together or of a self-adhering polymer-modified bitumen sheet shall be used in lieu of normal underlayment and extend from the ~~eave's edge~~ lowest edges of all roof surfaces to a point at least 24 inches (610 mm) inside the exterior wall line of the building.

Exception: Detached accessory structures that contain no conditioned floor area.

(Renumber subsequent sections)

**TABLE 1507.8
WOOD SHINGLE AND SHAKE INSTALLATION**

ROOF ITEM	WOOD SHINGLES	WOOD SHAKES
4. Underlayment	—	—
Temperate climate	Underlayment shall comply with ASTM D 226, Type 1.	Underlayment shall comply with ASTM D 226, Type 1.
In areas where there is a possibility of ice forming along the eaves causing a backup of water.	An ice shield <u>barrier</u> that consists of at least two layers of underlayment cemented together or of a self-adhering polymer-modified bitumen sheet shall extend from the eave's edge to a point at least 24 inches inside the exterior wall line of the building.	An ice shield <u>barrier</u> that consists of at least two layers of underlayment cemented together or of a self-adhering polymer-modified bitumen sheet shall extend from the eave's edge <u>lowest edges of all roof surfaces</u> to a point at least 24 inches inside the exterior wall line of the building.

(Portions of table not shown do not change)

Reason: The intent of this Proposal is to coordinate the different Sections of IBC to consistently use the same terminology that most accurately describes this building element. The terms "ice shield", "ice dam membrane", and "ice barrier" are used in different Sections throughout both the IBC and IRC to describe the same element, that of a barrier to prevent damage from ice damming occurring under roof coverings. IBC Section 1507.2.8.2 uses the term "ice dam membrane", Table 1507.8 "ice shield", and Sections 1507.5.3, 1507.6.3, 1507.7.3, 1507.8.3 and 1507.9.3 all use the term "ice barrier". The change to the sections already containing the term "ice shield" is to only separate the text relating to the underlayment needing to comply with ASTM, and moving the text relating to the ice shield of that same section to a new subsection as these are two separate aspects of materials and construction. These Sections are already separated in Section 1507.2 for asphalt shingles.

The term "eave's edge" is changed to "lowest edges of all roof surfaces" due to the misapplication of this provision. It is the lowest edges of a roof where, due to the influence of gravity, melting snow and ice will refreeze and cause a back-up of ice. A few construction dictionaries define an "eave" as "the part of a roof that projects beyond the exterior wall". This would imply any exterior wall. Though, some dictionaries do go on to also state the eave is the "lower edge of a sloped roof". Technically, the extension over the roof on a gable end is a "rake", not an eave. This change correctly addresses the aspect that it is the lowest edges of a roof where there is a possibility of an ice dam occurring, not the rake or ridge of a roof. In its' application, it is the lowest edge of the roof where the underlayment is installed. This same change reflects the text of the 2006 IRC.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: This change makes the ice barrier requirements more uniform using consistent terminology that more accurately describes the applicable building elements.

Assembly Action:

None

Final Hearing Results

FS200-06/07

AS

Code Change No: FS201-06/07

Original Proposal

Sections: Proponent: Michael D. Fischer, The Kellen Company, representing the Asphalt Roofing Manufacturers Association

THIS PROPOSAL IS ON THE AGENDA OF THE IBC-STRUCTURAL AND THE IRC BUILDING/ENERGY CODE DEVELOPMENT COMMITTEES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IBC STRUCTURAL

Revise as follows:

1507.2.9.2 Valleys. Valley linings shall be installed in accordance with the manufacturer's instructions before applying shingles. Valley linings of the following types shall be permitted:

1. For open valleys (valley lining exposed) lined with metal, the valley lining shall be at least 16 inches (406 mm) wide and of any of the corrosion-resistant metals in Table 1507.2.9.2.
2. For open valleys, valley lining of two plies of mineral-surfaced roll roofing complying with ASTM D 3909 or ASTM D 6380 shall be permitted. The bottom layer shall be 18 inches (457 mm) and the top layer a minimum of 36 inches (914 mm) wide.
3. For closed valleys (valleys covered with shingles), valley lining of one ply of smooth roll roofing complying with ASTM D 6380, ~~Class S Type III, Class M Type II or ASTM D 3909~~ and at least 36 inches (914 mm) wide or types as described in Items 1 ~~and or~~ 2 above shall be permitted. Specialty Self-adhering polymer modified bitumen underlayment shall comply with complying with ASTM D 1970 shall be permitted in lieu of the lining material.

PART II – IRC BUILDING/ENERGY

Revise as follows:

R905.2.8.2 Valleys. Valley linings shall be installed in accordance with the manufacturer’s installation instructions before applying shingles. Valley linings of the following types shall be permitted:

1. For open valleys (valley lining exposed) lined with metal, the valley lining shall be at least 24 inches (610 mm) wide and of any of the corrosion-resistant metals in Table R905.2.8.2.
2. For open valleys, valley lining of two plies of mineral surfaced roll roofing, complying with ASTM D3909 or ASTM D6380 Class M, shall be permitted. The bottom layer shall be 18 inches (457mm) and the top layer a minimum of 36 inches (914 mm) wide.
3. For closed valleys (valley covered with shingles), valley lining of one ply of smooth roll roofing complying with ASTM D6380 ~~Class S Type III, Class M Type II, or ASTM D3909~~ and at least 36 inches wide (914 mm) or valley lining as described in Items 1 ~~and or~~ 2 above shall be permitted. Specialty Self-adhering polymer modified bitumen underlayment complying with ASTM D1970 may be used shall be permitted in lieu of the lining material.

Reason: (IBC and IRC) This proposal clarifies the requirements for valley linings and properly references ASTM D1970 for self-adhering modified bitumen underlayment. The IRC and IBC currently allow materials complying with ASTM D3909, normally used as cap sheets, to be used as valley lining in closed applications, but that reference is more appropriate for open conditions. This proposal appropriately provides for the addition of materials complying with ASTM D 1970 to be used in closed valley linings- consistent with the current underlayment requirements. Additionally, a grammatical error in item number 1 is fixed, non-mandatory language in number 3 is corrected, and the self-adhering polymer modified bitumen underlayment reference is corrected for consistency with the referenced standard.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

PART I C IBC STRUCTURAL

Committee Action:

Approved as Submitted

Committee Reason: The proposal clarifies valley lining requirements.

Assembly Action:

None

PART II C IRC

Committee Action:

Approved as Submitted

Committee Reason: This change clarifies the code, properly references ASTM D 1970 for closed valleys, and eliminates non-mandatory language.

Assembly Action:

None

Final Hearing Results

FS201-06/07, Part I	AS
FS201-06/07, Part II	AS

Code Change No: **FS204-06/07**

Original Proposal

Table 1507.8; IRC R905.7.5, R905.8.6

Proponent: Steven William Harris, Quality Auditing Institute, representing Cedar Shake and Shingle Bureau

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL AND THE IRC BUILDING/ENERGY CODE DEVELOPMENT COMMITTEES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IBC STRUCTURAL

Revise table as follows:

**TABLE 1507.8
WOOD SHINGLE AND SHAKE INSTALLATION**

ROOF ITEM	WOOD SHINGLES	WOOD SHAKES
5. Application	—	—
Attachment	Fasteners for wood shingles shall be corrosion-resistant hot dipped <u>galvanized or type 304 (type 316 for coastal areas) stainless steel</u> with a minimum penetration of 0.75 inch into the sheathing. For sheathing less than 0.5 inch thick, the fasteners shall extend through the sheathing.	Fasteners for wood shakes shall be corrosion-resistant hot dipped <u>galvanized or type 304 (type 316 for coastal areas)</u> with a minimum penetration of 0.75 inch into the sheathing. For sheathing less than 0.5 inch thick, the fasteners shall extend through the sheathing.
No. of fasteners	Two per shingle.	Two per shake.
Exposure	Weather exposures shall not forth in Table 1507.8.6	Weather exposures shall not exceed those set forth in Table 1507.9.7
Method	Shingles shall be laid with a side lap of not less than 1.5 inches between joints in courses, and no two joints in any three adjacent courses shall be in direct alignment. Spacing between shingles shall be 0.25 to 0.375 inch.	Shakes shall be laid with a side lap of not less than 1.5 inches between joints in adjacent courses. Spacing between shakes shall not be less than 0.375 inch or more than 0.625 inch for shakes and tapered shakes of naturally durable wood and shall be 0.25 to 0.375 inch for preservative tapered shakes.

(Portions of table not shown do not change)

PART II – IRC BUILDING/ENERGY

Revise as follows:

R905.7.5 Application. Wood shingles shall be installed according to this chapter and the manufacturer's installation instructions. Wood shingles shall be laid with a side lap not less than 1½ inches (38 mm) between joints in courses, and no two joints in any three adjacent courses shall be in direct alignment. Spacing between shingles shall not be less than ¼ inch to 3/8 inch (6 mm to 10 mm). Weather exposure for wood shingles shall not exceed those set in Table R905.7.5. Fasteners for wood shingles shall be ~~corrosion-resistant hot dipped~~ galvanized or type 304 (type 316 for coastal areas) stainless steel, with a minimum penetration of ½ inch (13 mm) into the sheathing. For sheathing less than ½ inch (13 mm) in thickness, the fasteners shall extend through the sheathing. Wood shingles shall be attached to the roof with two fasteners per shingle, positioned no more than ¾ inch (19 mm) from each edge and no more than 1 inch (25 mm) above the exposure line.

R905.8.6 Application. Wood shakes shall be installed according to this chapter and the manufacturer's installation instructions. Wood shakes shall be laid with a side lap not less than 1½ inches (38 mm) between joints in adjacent courses. Spacing between shakes in the same course shall be 1/8 inch to 5/8 inch (3 mm to 16 mm) for shakes and

tapersawn shakes of naturally durable wood and shall be ¼ inch to 3/8 inch (6mm to 10 mm) for preservative treated taper sawn shakes. Weather exposure for wood shakes shall not exceed those set forth in Table R905.8.6. Fasteners for wood shakes shall be ~~corrosion-resistant~~ hot dipped galvanized or type 304 (type 316 for coastal areas) stainless steel, with a minimum penetration of ½ inch (12.7 mm) into the sheathing. For sheathing less than ½ inch (12.7 mm) in thickness, the fasteners shall extend through the sheathing. Wood shakes shall be attached to the roof with two fasteners per shake, positioned no more than 1 inch (25 mm) from each edge and no more than 2 inches (51 mm) above the exposure line.

Reason: This code change will eliminate the use of electro galvanized fasteners which have been shown to fail prematurely causing shakes or shingles to lose their attachment to the deck.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing Results

**PART I C IBC STRUCTURAL
Committee Action:**

Approved as Submitted

Committee Reason: The corrosion-resistant fasteners this code change requires have a useful life commensurate with cedar shingles and shakes and thus protect against premature failure of the attachment to the deck.

Assembly Action:

None

**PART II C IRC
Committee Action:**

Disapproved

Committee Reason: This proposal lacks a definition of Acoastal areas®. No technical data was submitted to document premature failure of electro-galvanized fasteners.

Assembly Action:

None

Final Hearing Results

FS204-06/07, Part I	AS
FS204-06/07, Part II	D

Code Change No: FS208-06/07

Original Proposal

Section: 1507.12.3

Proponent: David L. Roodvoets, DLR Consultants, representing Single-ply Roofing Institute, Inc. (SPRI)

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THAT COMMITTEE.

Add new text as follows:

1507.12.3 Ballasted thermoset low slope roofs (<2:12) shall be installed in accordance with this section and section 1504.4

Reason: This change clarifies the requirements for thermoset ballasted roofs. It is proposed to be added so that users can refer directly to section requirements.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:**Approved as Submitted**

Committee Reason: The proposal clarifies requirements for thermoset ballasted roofs by inserting a cross reference to an applicable requirement.

Assembly Action:**None**

Final Hearing Results

FS208-06/07

AS

Code Change No: FS209-06/07

Original Proposal

Section: 1507.13.3 (New)

Proponent: David L. Roodvoets, DLR Consultants, representing Single-ply Roofing Institute, Inc. (SPRI)

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THAT COMMITTEE.

Add new text as follows:

1507.13.3 Ballasted thermoplastic low slope roofs (<2:12) shall be installed in accordance with this section and section 1504.4

(Renumber subsequent sections)

Reason: This change clarifies the requirements for thermoplastic ballasted roofs. It is proposed to be added so that uses can refer directly to section requirements.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:**Approved as Submitted**

Committee Reason: The proposal clarifies requirements for ballasted thermoplastic roofs by inserting a cross reference to an applicable requirement.

Assembly Action:**None**

Final Hearing Results

FS209-06/07

AS

Code Change No: **FS210-06/07**

Original Proposal

Section: 1507.16 (New)

Proponent: Mark S. Graham, James R. Kirby, National Roofing Contractors Association

Add new text as follows:

1507.16 Roof gardens and landscaped roofs. Roof gardens and landscaped roof shall comply with the requirements of this Chapter, Section 1607.11.2.2 and Section 1607.11.2.3.

Reason: This proposed code change adds new requirements and clarifies existing requirements in the code. This proposed code language requires roof gardens and landscaped roofs to equivalently meet the same requirements as all other roof systems. Additionally, this proposed code language ties the existing requirements for special purpose roofs (e.g., garden roofs) and landscaped roofs in Chapter 16 to Chapter 15.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: Is this provision better located in 1504 or 1509?

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: This code change provides cross references to Chapter 16 that assure loading requirements for landscaped roofs are included by the designer.

Assembly Action:

None

Final Hearing Results

FS210-06/07

AS

Code Change No: **FS211-06/07**

Original Proposal

Section: 1509.2.1

Proponent: Joe Holland, Hoover Treated Wood Products, Inc.

THIS PROPOSAL IS ON THE AGENDA OF THE IBC GENERAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THAT COMMITTEE.

Revise as follows:

1509.2.1 Type of construction. Penthouses shall be constructed with walls, floors and roof as required for the building.

Exceptions:

1. On buildings of Type I ~~and II~~ construction, the exterior walls and roofs of penthouses with a fire separation distance of more than 5 feet (1524 mm) and less than 20 feet (6096 mm) shall be of at least 1-hour fire-resistance-rated noncombustible construction. Walls and roofs with a fire separation distance of 20 feet (6096 mm) or greater shall be of noncombustible construction. Interior framing and walls shall be of noncombustible construction.
2. On buildings of Type I two stories or less in height and Type II construction, the exterior walls and roofs of penthouses with a fire separation distance of more than 5 feet (1524 mm) and less than 20 feet (6096 mm) shall be of at least 1-hour fire-resistance-rated noncombustible or fire-retardant-treated wood construction. Walls and roofs with a fire separation distance of 20 feet (6096 mm) or greater shall be of noncombustible or fire-retardant-treated wood construction. Interior framing and walls shall be of noncombustible or fire-retardant-treated wood construction.
- ~~2.~~ 3. On buildings of Type III, IV and V construction, the exterior walls of penthouses with a fire separation distance of more than 5 feet (1524 mm) and less than 20 feet (6096 mm) shall be at least 1-hour fire-resistance-rated construction. Walls with a fire separation distance of 20 feet (6096 mm) or greater from a common property line shall be of Type IV, ~~or noncombustible, or fire-retardant-treated wood~~ construction. Roofs shall be constructed of materials and fire-resistance rated as required in Table 601 ~~and Section 601 item 1.3.~~ Interior framing and walls shall be Type IV, ~~or noncombustible, or fire-retardant-treated wood~~ construction.
- ~~3.~~ 4. On buildings of Type I ~~II~~ unprotected noncombustible enclosures housing only mechanical equipment and located with a minimum fire separation distance of 20 feet (6096 mm) shall be permitted.
5. On buildings of Type I two stories or less, II, III, IV, and V unprotected noncombustible or fire-retardant-treated wood enclosures housing only mechanical equipment and located with a minimum fire separation distance of 20 feet (6096 mm) shall be permitted.
- ~~4.~~ 6. On one-story buildings, combustible unroofed mechanical equipment screens, fences or similar enclosures are permitted where located with a fire separation distance of at least 20 feet (6096 mm) from adjacent property lines and where not exceeding 4 feet (1219 mm) in height above the roof surface.
- ~~5.~~ 7. Dormers shall be of the same type of construction as the roof on which they are placed, or of the exterior walls of the building.

Reason: The roof structure on all types of construction can be constructed using fire-retardant-treated wood. This change clarifies that a roof top structure can be FRTW as well.

With the limitation and size restrictions contained within the exceptions for rooftop structures it's inconsistent to not allow materials used in the construction of the roof structure to be used for a fence on a roof, or a penthouse.

Section 603.1.3 allows the roof structure to be FRTW in Type I two stories or less and Type II.

Cost Impact: The code change proposal will not increase the cost of construction and may save in construction costs and time.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The proposal provides clarity with construction types and coordination with other allowances for fire-retardant-treated wood such as that allowed for roofs in Section 603.1.3.

Assembly Action:

None

Final Hearing Results

FS211-06/07

AS

Code Change No: FS212-06/07

Original Proposal

Section: 1510.3

Proponents: Mark S. Graham, James R. Kirby, National Roofing Contractors Association

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THAT COMMITTEE.

Revise as follows:

1510.3 Recovering versus replacement. New roof coverings shall not be installed without first removing all existing layers of roof coverings down to the roof deck where any of the following conditions occur:

1. Where the existing roof or roof covering is water soaked or has deteriorated to the point that the existing roof or roof covering is not adequate as a base for additional roofing.
2. Where the existing roof covering is wood shake, slate, clay, cement or asbestos-cement tile.
3. Where the existing roof has two or more applications of any type of roof covering.

Exceptions:

1. Complete and separate roofing systems, such as standing-seam metal roof systems, that are designed to transmit the roof loads directly to the building's structural system and that do not rely on existing roofs and roof coverings for support, shall not require the removal of existing roof coverings.
2. Metal panel, metal shingle and concrete and clay tile roof coverings shall be permitted to be installed over existing wood shake roofs when applied in accordance with Section 1510.4.
3. The application of a new protective coating over an existing spray polyurethane foam roofing system shall be permitted without tear-off of existing roof coverings.

Reason: The proposed code change clarifies the intent of the code by specifically indicating that when roof removal is necessary removal of all roof coverings down to the roof is required.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The proposal clarifies the current requirement for removing roof coverings by indicating the removal is to be down to the roof deck.

Assembly Action:

None

Final Hearing Results

FS212-06/07

AS

Code Change No: **FS216-06/07**

Original Proposal

Section: 2606.4

Proponent: William E. Koffel, P.E., Koffel Associates, Inc.

Revise as follows:

2606.4 Specifications. Light-transmitting plastics, including thermoplastic, thermosetting or reinforced thermosetting plastic material, shall have a self-ignition temperature of 650°F (343°C) or greater where tested in accordance with ASTM D 1929; a smoke-developed index not greater than 450 where tested in the manner intended for use in accordance with ASTM E84, or an average smoke density rating not greater than 75 where tested in the thickness intended for use in accordance with ASTM D 2843 and shall conform to one of the following combustibility classifications:

Class CC1: Plastic materials that have a burning extent of 1 inch (25 mm) or less where tested at a nominal thickness of 0.060 inch (1.5 mm), or in the thickness intended for use, in accordance with ASTM D 635,

Class CC2: Plastic materials that have a burning rate of 2.5 inches per minute (1.06 mm/s) or less where tested at a nominal thickness of 0.060 inch (1.5 mm), or in the thickness intended for use, in accordance with ASTM D 635.

Reason: ASTM D 2843 required that a smoke density rating be obtained for three specimens and that an average smoke density rating for the three specimens be reported. The proposed change clarifies the original intent of the code which was that the average smoke density rating of the three specimens does not exceed 75. Without the clarification, one could interpret the Code to say that the smoke density of all three specimens shall not exceed 75.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Modified

Modify the proposal as follows:

2606.4 Specifications. Light-transmitting plastics, including thermoplastic, thermosetting or reinforced thermosetting plastic material, shall have a self-ignition temperature of 650°F (343°C) or greater where tested in accordance with ASTM D 1929; a smoke-developed index not greater than 450 where tested in the manner intended for use in accordance with ASTM E84, or an maximum average smoke density rating not greater than 75 where tested in the thickness intended for use in accordance with ASTM D 2843 and shall conform to one of the following combustibility classifications:

Class CC1: Plastic materials that have a burning extent of 1 inch (25 mm) or less where tested at a nominal thickness of 0.060 inch (1.5 mm), or in the thickness intended for use, in accordance with ASTM D 635,

Class CC2: Plastic materials that have a burning rate of 2.5 inches per minute (1.06 mm/s) or less where tested at a nominal thickness of 0.060 inch (1.5 mm), or in the thickness intended for use, in accordance with ASTM D 635.

Committee Reason: This makes the code technically correct. The reported results are an average of the three tests. The committee did modify the proposal by inserting the word maximum since it is the highest smoke density rating during the test which is of concern and should be reported.

Assembly Action:

None

Final Hearing Results

FS216-06/07

AM

Code Change No: **FS217-06/07**

Original Proposal

Chapter 35

Proponent: Standards writing organizations as listed below.

Revise standards as follows:

ASTM

ASTM International
100 Barr Harbor Drive
West Conshohocken, PA 19428-2959

Standard reference number	Title
A 240/A 240M- <u>05a</u> 04	Standard Specification for Chromium and Chromium-nickel Stainless Steel Plate, Sheet and Strip for Pressure Vessels and for General Applications
A 463/A 463M – <u>05</u> 02a	Specification for Steel Sheet, Aluminum-coated, by the Hot Dip Process
A 653/A 653- <u>05a</u> 04a	Specification for Steel Sheet, Zinc-Coated Galvanized or Zinc-Iron Alloy-coated Galvannealed by the Hot-Dip Process
A 755/A 755M- <u>03</u> 04	Specification for Steel Sheet, Metallic-coated by the Hot-dip Process and Prepainted by the Coil-coating Process for Exterior Exposed Building Products
A 792A 792M- <u>05</u> 03	Specification for Steel Sheet, 55% Aluminum-zinc Allow-coated by the Hot-dip Process
A 875/A 875M- <u>05</u> 02a	Standard Specification for Steel Sheet Zinc-5 percent, Aluminum Allow-coated by the Hot-dip Process
A 924/A <u>924M</u> -04	Standard Specification for General Requirements for Steel Sheet, Metallic-coated by the Hot-Dip Process
C 73- <u>05</u> 99a	Specification for Calcium Silicate Face Brick (Sand-Lime Brick)
C 140- <u>05a</u> 03	Test Method Sampling and Testing Concrete Masonry Units and Related Units
C 330- <u>05</u> 04	Specification for Lightweight Aggregates for Structural Concrete
C 331- <u>05</u> 04	Specification for Lightweight Aggregates for Concrete Masonry Units
C 406- <u>05</u> 00	Specification Roofing Slate
C 514- <u>04</u> 04	Specification for Nails for the Application of Gypsum Board
C 547- <u>06</u> 03	Specification for Mineral Fiber Pipe Insulation
C 635- <u>04</u> 00	Specification for the Manufacturer, Performance, and Testing of Metal Suspension Systems for Acoustical Tile and Lay-In Panel Ceilings
C 728- <u>05</u> ⁰⁴ 97	Standard Specification for Perlite Thermal Insulation Board
C 836- <u>05</u> 03	Specification for High Solids Content, Cold Liquid-Applied Elastomeric Waterproofing Membrane for Use with Separate Wearing Course
C 957- <u>05a</u> 04	Specification for High-Solids Content, Cold Liquid-Applied Elastomeric Waterproofing Membrane with Integral Wearing Surface
C 1029- <u>05a</u> 02	Specification for Spray-Applied Rigid Cellular Polyurethane Thermal Insulation
C 1289— <u>05a</u> 03	Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board
D 41- <u>05</u> 94(2000)e04	Specification for Asphalt Primer Used in Roofing, Dampproofing, and Waterproofing
D 225- <u>05</u> 04	Specification for Asphalt Shingles (Organic Felt) Surfaced with Mineral Granules
D 226- <u>05</u> 97a	Specification for Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing
D 1227- <u>95</u> (2000) 00	Specification for Emulsified Asphalt Used as a Protective Coating for Roofing

D 1863- <u>03</u> 05	Specification for Mineral Aggregate Used on Built-Up Roofs
D 2178- <u>04</u> 97a	Specification for Asphalt Glass Felt Used in Roofing and Waterproofing
D 2822- <u>05</u> 94(1997)e04	Specification for Asphalt Roof Cement
D 2898-94 (2004) 4999	Test Methods for Accelerated Weathering of Fire-Retardant-Treated Wood for Fire Testing
D 3019- <u>94</u> (2000)e01 (Supp)	Specification for Lap Cement Used with Asphalt Roll Roofing, Non-Fibered, Asbestos Fibered, and Non-Asbestos Fibered
D 3161- <u>05</u> 03b	Test Method for a Wind Resistance of Asphalt Shingles (Fan Induced Method)
D 3462- <u>05</u> 04	Specification for Asphalt Shingles Made From Glass Felt and Surfaced with Mineral Granules
D 3679- <u>05</u> 04	Specification for Rigid Poly (Vinyl Chloride) (PVC) Siding
D 3909-97b(2004)e01	Specification for Asphalt Roll Roofing (Glass Felt) Surfaced with Mineral Granules
D 4869- <u>05</u> 04	Specification for Asphalt-Saturated (Organic Felt) Underlayment Used in Steep Slope Roofing
D 4990-97a(2005)e01	Specification for Coal Tar Glass Felt Used in Roofing and Waterproofing
D 5019- <u>05</u> 96e04	Specification for Reinforced Non-Vulcanized Polymeric Sheet Used in Roofing Membrane
D 5726-98(2005)	Specification for Thermoplastic Fabrics Used in Hot-Applied Roofing and Waterproofing
D 6083- <u>05</u> e01-97a	Specification for Liquid Applied Acrylic Coating Used in Roofing
D 6164- <u>05</u> 00	Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using Polyester Reinforcements
D 6222- <u>02</u> e01	Specification for Atactic Polypropylene (APP) Modified Bituminous Sheet Materials Using Polyester Reinforcements
D 6298- <u>05</u> 00	Specification for Fiberglass Reinforced Styrene-Butadiene-Styrene (SBS) Modified Bituminous Sheets with a Factory Applied Metal Surface
D 6380- <u>03</u> 04 ⁺	Standard Specification for Asphalt Roll Roofing (Organic) Felt
D 6381- <u>03</u> b	Standard Test Method for Measurement of Asphalt Shingle Mechanical Uplift Resistance
D 6757- <u>05</u> 02	Standard Specification for Inorganic Underlayment for Use with Steep Slope Roofing Products
E 108- <u>05</u> 04	Test Methods for Fire Test of Roof Coverings
E 119- <u>05</u> a 00	Test Methods for Fire Tests of Building Construction and Materials
E 136- <u>04</u> 99e04	Test Method for Behavior of Materials in a Vertical Tube Furnace at 750 Degrees C
E1592- <u>05</u> 04	Test Method for Structural Performance of Sheet Metal Roof and Siding Systems by Uniform Static Air Pressure Difference
E 1966- <u>01</u> 00	Test Method for Fire Resistant Joint Systems
E 2307- <u>04</u> e01	Standard Test Method for Determining Fire Resistance of Perimeter Fire Barrier Systems Using Intermediate-Scale, Multi-Story Test Apparatus
F 1667- <u>05</u> 03	Specification for Driven Fasteners: Nails, Spikes and Staples
F 2006-00(2005)	Standard/Safety Specification for Window Fall Prevention Devices for Non-Emergency Escape (Egress) and Rescue (Ingress) Windows
G 152- <u>05</u> 04	Practice for Operating Open Flame Carbon Arc Light Apparatus for Exposure of Nonmetallic Materials
G 154- <u>05</u> 00A	Practice for Operating Fluorescent Light Apparatus for UV Exposure of Nonmetallic Materials
G 155- <u>05</u> a 04	Practice for Operating Xenon Arc Light Apparatus for Exposure of Non-Metallic Materials

GA

Gypsum Association
810 First Street, N.E. #510
Washington, DC 20002-42881

Standard reference number	Title
GA 600- <u>06</u> 03	Fire Resistance Design Manual <u>18th</u> 17th Edition

NFPA

National Fire Protection Association
 1 Batterymarch Park
 Quincy, MA 02269-9101

Standard reference number	Title
101- 06 03 030	Life Safety Code
257-00	Standard for on Fire Test for Window and Glass Block Assemblies
259- 03 04	Test Method for Potential Heat of Building Materials
285- 06 98	Method of Test for the Evaluation of Flammability <u>Fire Propagation</u> Characteristics of Exterior Non-Load-Bearing Wall Assemblies Containing Combustible Components
286- 06 00	Methods of Fire Tests for Evaluating Contribution of Wall and Ceiling Interior Finish to Room Fire Growth
288-01	Standard Methods of Fire Tests of Floor Fire Door Assemblies <u>Installed Horizontally</u> Fire-Resistance-Rated Floor Systems

UL

Underwriters Laboratories
 333 Pfingsten Road
 Northbrook, IL 60062

Standard reference number	Title
103-2001	Factory-Built Chimneys, for Residential Type and Building Heating Appliances with Revisions through December 2003 <u>2005</u>
217-97	Single and Multiple Stations Smoke Alarms - with revisions through January 2004 <u>August 2005</u>
300- 2005 4996	Fire Testing of Fire Extinguishing Systems for Protection of Restaurant Cooking Areas with Revisions through December 1998
790- 04 98	Tests for Fire Resistance of Roof Covering Materials with Revisions through July 1998
1784- 2001 95	Air Leakage Tests of Door Assemblies - <u>with Revisions through December 2004</u>
1897- 2004 4998	Uplift Tests for Roof Covering Systems with Revisions through November 2002
2079- 2004 98	Tests for Fire Resistance of Building Joint Systems <u>with Revisions through March 2006</u>
2390-04	Test Method for Measuring the Wind Uplift Coefficients for Asphalt Shingles - <u>with Revisions through January 2004</u>

Reason: The *ICC Code Development Process for the International Codes (Procedures)* Section 4.5* requires the updating of referenced standards to be accomplished administratively, and be processed as a Code Proposal. In May 2005, a letter was sent to each developer of standards that are referenced in the I-Codes, asking them to provide ICC with a list of their standards in order to update to the current edition. Above is the list received of the referenced standards under the maintenance responsibility of the IBC Fire Safety Committee.

***4.5 Updating Standards:** The updating of standards referenced by the Codes shall be accomplished administratively by the appropriate code development committee in accordance with these full procedures except that multiple standards to be updated may be included in a single proposal.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: It is important to keep the standards updated to the current editions of the standards. This assures that the most up-to-date information is included and also that the standards are available for both the designers and code enforcement agencies.

Assembly Action:

None

Final Hearing Results

FS217-06/07

AS

IBC – GENERAL

Code Change No: **G4-06/07**

Original Proposal

Sections: 112.1, 1612.3, 3109.4.1.8, 3202.1.2, 3202.3.4, 3202.4, 3303.6, 3306.2 (IEBC [B] 1401.6.1), 3308.1(IEBC [B] 1403.1), 3409.9 (IEBC [B] 308.9), G102.2

Proponent: Philip Brazil, P.E., Reid Middleton, Inc., representing the Washington Association of Building Officials

Revise as follows:

112.1 General. In order to hear and decide appeals of orders, decisions or determinations made by the building official relative to the application and interpretation of this code, there shall be and is hereby created a board of appeals. The board of appeals shall be appointed by the applicable governing body authority and shall hold office at its pleasure. The board shall adopt rules of procedure for conducting its business.

1612.3 Establishment of flood hazard areas. To establish flood hazard areas, the applicable governing body authority shall adopt a flood hazard map and supporting data. The flood hazard map shall include, at a minimum, areas of special flood hazard as identified by the Federal Emergency Management Agency in an engineering report entitled "The Flood Insurance Study for [INSERT NAME OF JURISDICTION]," dated [INSERT DATE OF ISSUANCE], as amended or revised with the accompanying Flood Insurance Rate Map (FIRM) and Flood Boundary and Floodway Map (FBFM) and related supporting data along with any revisions thereto. The adopted flood hazard map and supporting data are hereby adopted by reference and declared to be part of this section.

3109.4.1.8 Dwelling wall as a barrier. Where a wall of a dwelling serves as part of the barrier, one of the following shall apply:

1. Doors with direct access to the pool through that wall shall be equipped with an alarm that produces an audible warning when the door and/or its screen, if present, are opened. The alarm shall be listed in accordance with UL 2017. The audible alarm shall activate within 7 seconds and sound continuously for a minimum of 30 seconds after the door and/or its screen, if present, are opened and be capable of being heard throughout the house during normal household activities. The alarm shall automatically reset under all conditions. The alarm shall be equipped with a manual means, such as touchpad or switch, to temporarily deactivate the alarm for a single opening. Such deactivation shall last for not more than 15 seconds. In dwellings not required to be Accessible, Type A or Type B units, the deactivation switch shall be located 54 inches (1372 mm) or more above the threshold of the door. In dwellings required to be Accessible, Type A or Type B units, the deactivation switch(es) shall be located at 54 inches (1372 mm) maximum and 48 inches minimum above the threshold of the door.
2. The pool shall be equipped with a power safety cover that complies with ASTM F 1346.
3. Other means of protection, such as self-closing doors with self-latching devices, which are approved by the administrative authority building official, shall be accepted so long as the degree of protection afforded is not less than the protection afforded by Section 3109.4.1.8, Item 1 or 2.

3202.1.2 Vaults and other enclosed spaces. The construction and utilization of vaults and other enclosed space below grade shall be subject to the terms and conditions of the applicable governing authority ~~or legislative body having jurisdiction~~.

3202.3.4 Pedestrian walkways. The installation of a pedestrian walkway over a public right-of-way shall be subject to the approval of ~~local~~ the applicable governing authority having jurisdiction. The vertical clearance from the public right-of-way to the lowest part of a pedestrian walkway shall be 15 feet (4572 mm) minimum.

3202.4 Temporary encroachments. Where allowed by the ~~local~~ applicable governing authority having jurisdiction, vestibules and storm enclosures shall not be erected for a period of time exceeding 7 months in any one year and shall not encroach more than 3 feet (914 mm) nor more than one-fourth of the width of the sidewalk beyond the

street lot line. Temporary entrance awnings shall be erected with a minimum clearance of 7 feet (2134 mm) to the lowest portion of the hood or awning where supported on removable steel or other approved noncombustible support.

3303.6 Utility connections. Service utility connections shall be discontinued and capped in accordance with the approved rules and the requirements of the applicable governing authority having jurisdiction.

3306.2 (IEBC 1401.6.1) Walkways. A walkway shall be provided for pedestrian travel in front of every construction and demolition site unless the applicable governing authority having jurisdiction authorizes the sidewalk to be fenced or closed. Walkways shall be of sufficient width to accommodate the pedestrian traffic, but in no case shall they be less than 4 feet (1219 mm) in width. Walkways shall be provided with a durable walking surface. Walkways shall be accessible in accordance with Chapter 11 and shall be designed to support all imposed loads and in no case shall the design live load be less than 150 pounds per square foot (psf) (7.2 kN/m²).

3308.1 (IEBC 1403.1) Storage and handling of materials. The temporary use of streets or public property for the storage or handling of materials or of equipment required for construction or demolition, and the protection provided to the public shall comply with the provisions of the applicable governing authority having jurisdiction and this chapter.

3409.9 (IEBC 308.9) Historic buildings. These provisions shall apply to buildings and facilities designated as historic structures that undergo alterations or a change of occupancy, unless technically infeasible. Where compliance with the requirements for accessible routes, entrances or toilet facilities would threaten or destroy the historic significance of the building or facility, as determined by the applicable governing authority having jurisdiction, the alternative requirements of Sections 3409.9.1 through 3409.9.4 for that element shall be permitted.

G102.2 Establishment of flood hazard areas. Flood hazard areas are established in Section 1612.3 of the *International Building Code*, adopted by the applicable governing body authority on [INSERT DATE].

Reason: The purpose of this proposal is to make more consistent references to the regulatory authorities responsible for enforcement of the IBC in their jurisdictions. Typically, the building official is responsible for day-to-day enforcement. The IBC refers to the building official consistently throughout the IBC except for the definition of “immediately dangerous to life and health,” which refers to the code official, and Sections 903.6, 903.3.7 and 903.3.7.1 on hose threads and fire department connections, which refer to the “fire code official.”

In many jurisdictions there is a committee or other body, typically appointed by the local elected officials, with the authority to oversee the performance of building officials in their duties and to perform other regulatory functions (i.e., board of appeals). The IBC makes frequent references to such a body but it does not do so in a consistent manner. The most prevalent term for this body currently in the IBC is “applicable governing authority.” This proposal will make the references consistent.

Authority having jurisdiction. IRC (Def – permit, potable water, approved, code, labeled and listed, N1107.7) IPC (Def – approved, code, potable water, 302.2, 602.3.3, C101.1), IMC (Def approved, code, listed, approved), IFGC (Def – code, listed), IECC (101.2.2.4, Approved), ICCEC (Approved, Listed and listing), IPMC (106.3, 109.3, 302.4), IEBC (116.3, 1105.15, A505).

Governing Body. Ordinances, IRC (112.1, AG105.2 (Item 9.3)), IFC (106.2, 108.1, A101.2, A101.3.3), ICCEC (701.1, 1101.1), IPMC (110.4), IEBC (112.1, 117.4).

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis. The IBC also includes these terms in the example of the Adoption Ordinance, the definition of ‘permit’ and Section 3303.4.

While some sections listed are typically the purview of other committees, for consistency, the General Committee will make the determination for this entire proposal.

Public Hearing Results

Committee Action:

Approved as Modified

Modify the proposal as follows:

3109.4.1.8 Dwelling wall as a barrier. Where a wall of a dwelling serves as part of the barrier, one of the following shall apply:

1. Doors with direct access to the pool through that wall shall be equipped with an alarm that produces an audible warning when the door and/or its screen, if present, are opened. The alarm shall be listed in accordance with UL 2017. The audible alarm shall activate within 7 seconds and sound continuously for a minimum of 30 seconds after the door and/or its screen, if present, are opened and be capable of being heard throughout the house during normal household activities. The alarm shall automatically reset under all conditions. The alarm shall be equipped with a manual means, such as touchpad or switch, to temporarily deactivate the alarm for a single opening. Such deactivation shall last for not more than 15 seconds. In dwellings not required to be Accessible, Type A or Type B units, the deactivation switch shall be located 54 inches (1372 mm) or more above the threshold of the door. In dwellings required to be Accessible, Type A or Type B units, the deactivation switch(es) shall be located at 54 inches (1372 mm) maximum and 48 inches minimum above the threshold of the door.
2. The pool shall be equipped with a power safety cover that complies with ASTM F 1346.

3. Other means of protection, such as self-closing doors with self-latching devices, which are approved by the building official shall be accepted so long as the degree of protection afforded is not less than the protection afforded by Section 3109.4.1.8, Item 1 or 2.

(Portions of proposal not shown remain unchanged)

Committee Reason: The proposal was approved based upon the need to use consistent language to refer to the regulatory authorities responsible for enforcement of the IBC. See proponents reason. The committee agreed that within Section 3109.4.1.8 the appropriate authority is the building official but that it was not necessary to explicitly state as the definition of approved would include the building official.

Assembly Action:

None

Final Hearing Results

G4-06/07

AM

Code Change No: **G6-06/07**

Original Proposal

Sections: 402.6, 414.2.4, 603.1, 704.9, 708.4, 717.4.2, Table 803.5, 1206.2, 1206.3, 1405.4, 1406.2.2, 1406.3, Table 1505.1, 1808.2.5, 1915.5, 2606.12, 3306.7, Table 3410.6.11 (IEBC [B] Table 1301.6.11); IFC Table 803.3, IFC 907.2.4 (IBC [F] 907.2.4), IFC 907.2.8.1 (IBC [F] 907.2.8.1), 907.2.9 (IBC [F] 907.2.9)

Proponent: Philip Brazil, PE, Reid Middleton, Inc., representing himself

THIS PROPOSAL IS ON THE AGENDA OF THE IBC GENERAL AND IFC CODE DEVELOPMENT COMMITTEES. SEE THE TENTATIVE HEARING ORDER FOR THESE COMMITTEES

PART I – IBC

Revise as follows:

402.6 Types of construction. The area of any covered mall building, including anchor buildings, of Type I, II, III and IV construction, shall not be limited provided the covered mall building and attached anchor buildings and parking garages are surrounded on all sides by a permanent open space of not less than 60 feet (18 288 mm) and the anchor buildings do not exceed three stories ~~in height above grade plane~~. The allowable height and area of anchor buildings greater than three stores ~~in height above grade plane~~ shall comply with Section 503, as modified by Sections 504 and 506. The construction type of open parking garages and enclosed parking garages shall comply with Sections 406.3 and 406.4, respectively.

414.2.4 Fire-resistance-rating requirements. The required fire-resistance rating for fire barriers shall be in accordance with Table 414.2.2. The floor construction of the control area and the construction supporting the floor of the control area shall have a minimum 2-hour fire-resistance rating.

Exception: The floor construction of the control area and the construction supporting the floor of the control area is allowed to be 1-hour fire-resistance rated in buildings of Type IIA, IIIA and VA construction, provided that both of the following conditions exist:

1. The building is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1, and
2. The building is three stories or less ~~in height above grade plane~~.

603.1 Allowable materials. Combustible materials shall be permitted in buildings of Type I or Type II construction in the following applications and in accordance with Sections 603.1.1 through 603.1.3:

1. Fire-retardant-treated wood shall be permitted in:

- 1.1. Nonbearing partitions where the required fire-resistance rating is 2 hours or less.
- 1.2. Nonbearing exterior walls where no fire rating is required.
- 1.3. Roof construction, including girders, trusses, framing and decking.

Exception: In buildings of Type I construction exceeding two stories ~~in height~~ above grade plane, fire-retardant-treated wood is not permitted in roof construction when the vertical distance from the upper floor to the roof is less than 20 feet (6096 mm).

(Items 2 through 22 of section to remain unchanged)

704.9 Vertical separation of openings. Openings in exterior walls in adjacent stories shall be separated vertically to protect against fire spread on the exterior of the buildings where the openings are within 5 feet (1524 mm) of each other horizontally and the opening in the lower story is not a protected opening with a fire protection rating of not less than $\frac{3}{4}$ hour. Such openings shall be separated vertically at least 3 feet (914 mm) by spandrel girders, exterior walls or other similar assemblies that have a fire-resistance rating of at least 1 hour or by flame barriers that extend horizontally at least 30 inches (762 mm) beyond the exterior wall. Flame barriers shall also have a fire-resistance rating of at least 1 hour. The unexposed surface temperature limitations specified in ASTM E 119 shall not apply to the flame barriers or vertical separation unless otherwise required by the provisions of this code.

Exceptions:

1. This section shall not apply to buildings that are three stories or less ~~in height~~ above grade plane.
2. This section shall not apply to buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2.
3. Open parking garages.

708.4 Continuity. Fire partitions shall extend from the top of the foundation or floor/ceiling assembly below to the underside of the floor or roof sheathing, slab or deck above or to the fire-resistance-rated floor/ceiling or roof/ceiling assembly above, and shall be securely attached thereto. If the partitions are not continuous to the sheathing, deck or slab, and where constructed of combustible construction, the space between the ceiling and the sheathing, deck or slab above shall be fireblocked or draftstopped in accordance with Sections 717.2 and 717.3 at the partition line. The supporting construction shall be protected to afford the required fire-resistance rating of the wall supported, except for tenant and sleeping unit separation walls and corridor walls in buildings of Types IIB, IIIB and VB construction.

Exceptions:

1. The wall need not be extended into the crawl space below where the floor above the crawl space has a minimum 1-hour fire-resistance rating.
2. Where the room-side fire-resistance-rated membrane of the corridor is carried through to the underside of the floor or roof sheathing, deck or slab of a fire-resistance-rated floor or roof above, the ceiling of the corridor shall be permitted to be protected by the use of ceiling materials as required for a 1-hour fire-resistance-rated floor or roof system.
3. Where the corridor ceiling is constructed as required for the corridor walls, the walls shall be permitted to terminate at the upper membrane of such ceiling assembly.
4. The fire partition separating tenant spaces in a mall, complying with Section 402.7.2, are not required to extend beyond the underside of a ceiling that is not part of a fire-resistance-rated assembly. A wall is not required in attic or ceiling spaces above tenant separation walls.
5. Fireblocking or draftstopping is not required at the partition line in Group R-2 buildings that do not exceed four stories ~~in height~~ above grade plane, provided the attic space is subdivided by draftstopping into areas not exceeding 3,000 square feet (279 m²) or above every two dwelling units, whichever is smaller.
6. Fireblocking or draftstopping is not required at the partition line in buildings equipped with an automatic sprinkler system installed throughout in accordance with Section 903.3.1.1 or 903.3.1.2, provided that automatic sprinklers are installed in combustible floor/ceiling and roof/ceiling spaces.

717.4.2 Groups R-1 and R-2. Draftstopping shall be provided in attics, mansards, overhangs or other concealed roof spaces of Group R-2 buildings with three or more dwelling units and in all Group R-1 buildings. Draftstopping shall be installed above, and in line with, sleeping unit and dwelling unit separation walls that do not extend to the underside of the roof sheathing above.

Exceptions:

1. Where corridor walls provide a sleeping unit or dwelling unit separation, draftstopping shall only be required above one of the corridor walls.
2. Draftstopping is not required in buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.
3. In occupancies in Group R-2 that do not exceed four stories ~~in height~~ above grade plane, the attic space shall be subdivided by draftstops into areas not exceeding 3,000 square feet (279 m²) or above every two dwelling units, whichever is smaller.
4. Draftstopping is not required in buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.2, provided that automatic sprinklers are also installed in the combustible concealed spaces.

**TABLE 803.5
INTERIOR WALL AND CEILING FINISH REQUIREMENTS BY OCCUPANCY^k**

(No changes to table text)

For SI: 1 inch = 25.4 mm, 1 square foot = 0.0929 m².

- a. Class C interior finish materials shall be permitted for wainscoting or paneling of not more than 1,000 square feet of applied surface area in the grade lobby where applied directly to a noncombustible base or over furring strips applied to a noncombustible base and fireblocked as required by Section 803.4.1.
- b. In exit enclosures of buildings less than three stories ~~in height~~ above grade plane of other than Group I-3, Class B interior finish for nonsprinklered buildings and Class C interior finish for sprinklered buildings shall be permitted.
- c. Requirements for rooms and enclosed spaces shall be based upon spaces enclosed by partitions. Where a fire-resistance rating is required for structural elements, the enclosing partitions shall extend from the floor to the ceiling. Partitions that do not comply with this shall be considered enclosing spaces and the rooms or spaces on both sides shall be considered one. In determining the applicable requirements for rooms and enclosed spaces, the specific occupancy thereof shall be the governing factor regardless of the group classification of the building or structure.
- d. Lobby areas in Group A-1, A-2 and A-3 occupancies shall not be less than Class B materials.
- e. Class C interior finish materials shall be permitted in places of assembly with an occupant load of 300 persons or less.
- f. For places of religious worship, wood used for ornamental purposes, trusses, paneling or chancel furnishing shall be permitted.
- g. Class B material is required where the building exceeds two stories.
- h. Class C interior finish materials shall be permitted in administrative spaces.
- i. Class C interior finish materials shall be permitted in rooms with a capacity of four persons or less.
- j. Class B materials shall be permitted as wainscoting extending not more than 48 inches above the finished floor in corridors.
- k. Finish materials as provided for in other sections of this code.
- l. Applies when the exit enclosures, exit passageways, corridors or rooms and enclosed spaces are protected by a sprinkler system installed in accordance with Section

1206.2 Yards. Yards shall not be less than 3 feet (914 mm) in width for ~~one- and two-story~~ two stories or less above grade plane. For buildings more than two stories ~~in height~~ above grade plane, the minimum width of the yard shall be increased at the rate of 1 foot (305 mm) for each additional story. For buildings exceeding 14 stories ~~in height~~ above grade plane, the required width of the yard shall be computed on the basis of 14 stories above grade plane.

1206.3 Courts. Courts shall not be less than 3 feet (914 mm) in width. Courts having windows opening on opposite sides shall not be less than 6 feet (1829 mm) in width. Courts shall not be less than 10 feet (3048 mm) in length unless bounded on one end by a public way or yard. For buildings more than two stories ~~in height~~ above grade plane, the court shall be increased 1 foot (305 mm) in width and 2 feet (310 mm) in length for each additional story. For buildings exceeding 14 stories ~~in height~~ above grade plane, the required dimensions shall be computed on the basis of 14 stories above grade plane.

1405.4 Wood veneers. Wood veneers on exterior walls of buildings of Type I, II, III and IV construction shall be not less than 1 inch (25 mm) nominal thickness, 0.438-inch (11.1 mm) exterior hardboard siding or 0.375-inch (9.5 mm) exterior-type wood structural panels or particleboard and shall conform to the following:

1. The veneer shall not exceed three stories ~~in height, measured from above~~ the grade plane. Where fire-retardant-treated wood is used, the height shall not exceed four stories.
2. The veneer is attached to or furred from a noncombustible backing that is fire-resistance rated as required by other provisions of this code.
3. Where open or spaced wood veneers (without concealed spaces) are used, they shall not project more than 24 inches (610 mm) from the building wall.

1406.2.2 Architectural trim. In buildings of Type I, II, III and IV construction that do not exceed three stories above grade plane or 40 feet (12 192 mm) in height ~~above grade plane~~, exterior wall coverings shall be permitted to be constructed of wood where permitted by Section 1405.4 or other equivalent combustible material. Combustible exterior wall coverings, other than fire-retardant-treated wood complying with Section 2303.2 for exterior installation, shall not exceed 10 percent of an exterior wall surface area where the fire separation distance is 5 feet (1524 mm) or less. Architectural trim that exceeds 40 feet (12 192 mm) in height above grade plane shall be constructed of approved noncombustible materials and shall be secured to the wall with metal or other approved noncombustible brackets.

1406.3 Balconies and similar projections. Balconies and similar projections of combustible construction other than fire-retardant-treated wood shall be fire-resistance rated in accordance with Table 601 for floor construction or shall be of Type IV construction in accordance with Section 602.4. The aggregate length shall not exceed 50 percent of the building's perimeter on each floor.

Exceptions:

1. On buildings of Type I and II construction, three stories or less ~~in height above grade plane~~, fire-retardant-treated wood shall be permitted for balconies, porches, decks and exterior stairways not used as required exits.
2. Untreated wood is permitted for pickets and rails or similar guardrail devices that are limited to 42 inches (1067 mm) in height.
3. Balconies and similar projections on buildings of Type III, IV and V construction shall be permitted to be of Type V construction, and shall not be required to have a fire-resistance rating where sprinkler protection is extended to these areas.
4. Where sprinkler protection is extended to the balcony areas, the aggregate length of the balcony on each floor shall not be limited.

TABLE 1505.1^{a, b}

MINIMUM ROOF COVERING CLASSIFICATION FOR TYPES OF CONSTRUCTION

IA	IB	IIA	IIB	IIIA	IIIB	IV	VA	VB
B	B	B	C ^c	B	C ^c	B	B	C ^c

For SI: 1 foot = 304.8 mm, 1 square foot = 0.0929m².

- a. Unless otherwise required in accordance with the *International Wildland-Urban Interface Code* or due to the location of the building within a fire district in accordance with Appendix D.
- b. Nonclassified roof coverings shall be permitted on buildings of Group R-3 and Group U occupancies, where there is a minimum fire-separation distance of 6 feet measured from the leading edge of the roof.
- c. Buildings that are not more than two stories ~~in height above grade plane~~ and having not more than 6,000 square feet of projected roof area and where there is a minimum 10-foot fire-separation distance from the leading edge of the roof to a lot line on all sides of the building, except for street fronts or public ways, shall be permitted to have roofs of No. 1 cedar or redwood shakes and No. 1 shingles.

1808.2.5 Stability. Piers or piles shall be braced to provide lateral stability in all directions. Three or more piles connected by a rigid cap shall be considered braced, provided that the piles are located in radial directions from the centroid of the group not less than 60 degrees (1 rad) apart. A two-pile group in a rigid cap shall be considered to be braced along the axis connecting the two piles. Methods used to brace piers or piles shall be subject to the approval of the building official.

Piles supporting walls shall be driven alternately in lines spaced at least 1 foot (305 mm) apart and located symmetrically under the center of gravity of the wall load carried, unless effective measures are taken to provide for eccentricity and lateral forces, or the wall piles are adequately braced to provide for lateral stability. A single row of piles without lateral bracing is permitted for one- and two-family dwellings and lightweight construction not exceeding two stories above grade plane or 35 feet (10 668 mm) in height, provided the centers of the piles are located within the width of the foundation wall.

1915.5 Fire-resistance-rating protection. Pipe columns shall be of such size or so protected as to develop the required fire-resistance ratings specified in Table 601. Where an outer steel shell is used to enclose the fire-protective covering, the shell shall not be included in the calculations for strength of the column section. The minimum diameter of pipe columns shall be 4 inches (102 mm) except that in structures of Type V construction not exceeding three stories above grade plane or 40 feet (12 192 mm) in height, pipe columns used in the basement and as secondary steel members shall have a minimum diameter of 3 inches (76 mm).

2606.12 Solar collectors. Light-transmitting plastic covers on solar collectors having noncombustible sides and bottoms shall be permitted on buildings not over three stories ~~in height~~ above grade plane or 9,000 square feet (836.1 m²) in total floor area, provided the light-transmitting plastic cover does not exceed 33.33 percent of the roof area for CC1 materials or 25 percent of the roof area for CC2 materials.

Exception: Light-transmitting plastic covers having a thickness of 0.010 inch (0.3 mm) or less or shall be permitted to be of any plastic material provided the area of the solar collectors does not exceed 33.33 percent of the roof area.

3306.7 Covered walkways. Covered walkways shall have a minimum clear height of 8 feet (2438 mm) as measured from the floor surface to the canopy overhead. Adequate lighting shall be provided at all times. Covered walkways shall be designed to support all imposed loads. In no case shall the design live load be less than 150 psf (7.2 kN/m²) for the entire structure.

Exception: Roofs and supporting structures of covered walkways for new, light-frame construction not exceeding two stories ~~in height~~ above grade plane are permitted to be designed for a live load of 75 psf (3.6kN/m²) or the loads imposed on them, whichever is greater. In lieu of such designs, the roof and supporting structure of a covered walkway are permitted to be constructed as follows:

1. Footings shall be continuous 2-inch by 6-inch (51mm by 152 mm) members.
2. Posts not less than 4 inches by 6 inches (102 mm by 152 mm) shall be provided on both sides of the roof and spaced not more than 12 feet (3658 mm) o.c.
3. Stringers not less than 4 inches by 12 inches (102 mm by 305 mm) shall be placed on edge upon the posts.
4. Joists resting on the stringers shall be at least 2 inches by 8 inches (51 mm by 203 mm) and shall be spaced not more than 2 feet (610 mm) o.c.
5. The deck shall be planks at least 2 inches (51 mm) thick or wood structural panels with an exterior exposure durability classification at least ²³/₃₂ inch (18.3 mm) thick nailed to the joists.
6. Each post shall be knee braced to joists and stringers by 2-inch by 4-inch (51 mm by 102 mm) minimum members 4 feet (1219 mm) long.
7. A 2-inch by 4-inch (51 mm by 102 mm) minimum curb shall be set on edge along the outside edge of the deck.

**TABLE 3410.6.11 (IEBC [B] Table 1301.6.11)
MEANS OF EGRESS VALUES
(No changes to table text)**

- a. The values indicated are for buildings six stories or less in height. For buildings over six stories ~~in height~~ above grade plane, add an additional -10 points.

PART II – IFC

Revise as follows:

**TABLE 803.3
INTERIOR WALL AND CEILING FINISH REQUIREMENTS BY OCCUPANCY^k**

(No changes to table text)

- a. Class C interior finish materials shall be allowed for wainscotting or paneling of not more than 1,000 square feet of applied surface area in the grade lobby where applied directly to a noncombustible base or over furring strips applied to a noncombustible base and fireblocked as required by Section 803.4 of the *International Building Code*.
- b. In exit enclosures of buildings less than three stories ~~in height~~ above grade plane of other than Group I-3, Class B interior finish for nonsprinklered buildings and Class C for sprinklered buildings shall be permitted.

- c. Requirements for rooms and enclosed spaces shall be based upon spaces enclosed by partitions. Where a fire-resistance rating is required for structural elements, the enclosing partitions shall extend from the floor to the ceiling. Partitions that do not comply with this shall be considered as enclosing spaces and the rooms or spaces on both sides shall be considered as one. In determining the applicable requirements for rooms and enclosed spaces, the specific occupancy thereof shall be the governing factor regardless of the group classification of the building or structure.
- d. Lobby areas in Group A-1, A-2 and A-3 occupancies shall not be less than Class B materials.
- e. Class C interior finish materials shall be allowed in Group A occupancies with an occupant load of 300 persons or less.
- f. In places of religious worship, wood used for ornamental purposes, trusses, paneling or chancel furnishing shall be allowed.
- g. Class B material is required where the building exceeds two stories.
- h. Class C interior finish materials shall be allowed in administrative spaces.
- i. Class C interior finish materials shall be allowed in rooms with a capacity of four persons or less.
- j. Class B materials shall be allowed as wainscoting extending not more than 48 inches above the finished floor in corridors.
- k. Finish materials as provided for in other sections of this code.
- l. Applies when the vertical exits, exit passageways, corridors or rooms and spaces are protected by an approved automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2.

907.2.4 Group F. A manual fire alarm system shall be installed in Group F occupancies that are two or more stories ~~in height above grade plane~~ and have an occupant load of 500 or more above or below the lowest level of exit discharge.

Exception: Manual fire alarm boxes are not required when the building is equipped throughout with an automatic sprinkler system and the notification appliances will activate upon sprinkler water flow.

907.2.8.1 Manual fire alarm system. A manual fire alarm system shall be installed in Group R-1 occupancies.

Exceptions:

- 1. A manual fire alarm system is not required in buildings not more than two stories ~~in height above grade plane~~ where all individual sleeping units and contiguous attic and crawl spaces are separated from each other and public or common areas by at least 1-hour fire partitions and each individual sleeping unit has an exit directly to a public way, exit court or yard.
- 2. Manual fire alarm boxes are not required throughout the building when the following conditions are met:
 - 2.1. The building is equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2;
 - 2.2. The notification appliances will activate upon sprinkler water flow; and
 - 2.3. At least one manual fire alarm box is installed at an approved location.

907.2.9 Group R-2. A manual fire alarm system shall be installed in Group R-2 occupancies where:

- 1. Any dwelling unit or sleeping unit is located three or more stories above the lowest level of exit discharge;
- 2. Any dwelling unit or sleeping unit is located more than one story below the highest level of exit discharge of exits serving the dwelling unit or sleeping unit; or
- 3. The building contains more than 16 dwelling units or sleeping units.

Exceptions:

- 1. A fire alarm system is not required in buildings not more than two stories ~~in height above grade plane~~ where all dwelling units or sleeping units and contiguous attic and crawl spaces are separated from each other and public or common areas by at least 1-hour fire partitions and each dwelling unit or sleeping unit has an exit directly to a public way, exit court or yard.
- 2. Manual fire alarm boxes are not required throughout the building when the following conditions are met:
 - 2.1. The building is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or Section 903.3.1.2; and
 - 2.2. The notification appliances will activate upon sprinkler flow.
- 3. A fire alarm system is not required in buildings that do not have interior corridors serving dwelling units and are protected by an approved automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2, provided that dwelling units either have a means of egress door opening directly to an exterior exit access that leads directly to the exits or are served by open-ended corridors designed in accordance with Section 1023.6, Exception 4.

Reason: All of the code sections in this proposal have one thing in common. They specify requirements for a building based on its number of stories. A story is defined in Sections 202 and 502.1 as “that portion of a building included between the upper surface of a floor and the upper surface of the floor or roof next above,” which includes portions of a building below grade plane (i.e., basements). Consequently, the number of stories specified in of these code sections would be determined beginning at the bottommost level in the building, which could be several levels (stories) below grade plane. The proposal will establish that the determination begins at the first story above grade plane, which is the probable intent in each case.

This proposal does not include each code section in the IBC that specifies requirements for a building based on its number of stories. There are cases where the determination of the number of stories in a building beginning at the bottommost level is warranted. Please refer to Sections 406.1.1, 415.4, 415.5, 415.7.3.3, 903.2.8.1(1), 903.3.1.2, 1015.2, 1206.3.2, 2305.1.5, 2305.2.5, 2603.5, 3310.1 and 3311.1.

There are also several code sections in the IBC that currently specify requirements for a building based on its number of stories above grade plane. Please refer to Sections 101.2 (Exception 1), 402.1, 402.7.3, 415.7.3.5, 415.9.2.3, 903.2.3(2), 903.2.6(2), 903.2.8(2), 1009.12, 1002.6 (Exception 1), 1018.2 (Item 1), 1025.1, 1407.11.1, 1407.11.2, 1705.1 (Exceptions 1 and 2), 1509.5, 1807.1.1, 2308.2(1), 2308.2.2 (Exception 2), 2308.11.2 (Exception 1), 2308.12.2 (Exception 1), 2607.3, 2608.2 (Item 1) and 3002.4. See code change proposal G44-04/05 (AM) for further information.

This proposal is partly a continuation of code change proposal G44-04/05 (AM), which successfully distinguished between requirements based on the height or number of stories of a building by measuring from grade plane versus the height of a component of a building by measuring from grade. There is also a similar proposal before the IBC Structural Committee.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis. While some sections listed are typically the purview of other committees, for consistency, the General Committee will make the determination for the entire Part I of this proposal.

Public Hearing Results

PART I C IBC

Committee Action:

Approved as Submitted

Committee Reason: Clarified specific cases within the code where stories below grade plane are not intended to be included when determining applicability of a requirement. See also the proponent’s reason.

Assembly Action:

None

PART II C IFC

Committee Action:

Disapproved

Committee Reason: Approval of the proposal could result in the installation of fewer fire alarm systems in the Section 907 items.

Assembly Action:

None

Final Hearing Results

G6-06/07, Part I
G6-06/07, Part II

AS
D

Code Change No: G8-06/07

Original Proposal

Sections: [F] 415.6.2.1.1, 505.4, 506.1.1, 507.2, 507.3, 507.4, 507.6, 507.7, 507.8, 507.9, 507.10, 509.3, 509.8, [F] 903.2.8.1 (IFC 903.2.8.1), [F] 903.2.10.1 (IFC 903.2.10), 1009.11 (IFC [B] 1009.11), 1020.1 (IFC [B] 1020.1), 502.1, 202

Proponent: Maureen Traxler, City of Seattle, WA, Department of Planning and Development

Revise as follows:

[F] 415.6.2.1.1 Height exception. Where storage tanks are located within only a ~~single-story~~ building no more than one story in height, the height limitation of Section 503 shall not apply for Group H.

505.4 Openness. A mezzanine shall be open and unobstructed to the room in which such mezzanine is located except for walls not more than 42 inches (1067 mm) high, columns and posts.

Exceptions:

1. Mezzanines or portions thereof are not required to be open to the room in which the mezzanines are located, provided that the occupant load of the aggregate area of the enclosed space does not exceed 10.
2. A mezzanine having two or more means of egress is not required to be open to the room in which the mezzanine is located if at least one of the means of egress provides direct access to an exit from the mezzanine level.
3. Mezzanines or portions thereof are not required to be open to the room in which the mezzanines are located, provided that the aggregate floor area of the enclosed space does not exceed 10 percent of the mezzanine area.
4. In industrial facilities, mezzanines used for control equipment are permitted to be glazed on all sides.
5. In other than Groups H and I occupancies no more than two stories in height ~~above grade plane~~ and equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1, a mezzanine having two or more means of egress shall not be required to be open to the room in which the mezzanine is located.

506.1.1 Basements. A single basement ~~that is not a story above grade plane~~ need not be included in the total allowable area, provided such basement does not exceed the area permitted for a building with no more than one story above grade plane.

507.2 Nonsprinklered, one story. The area of a Group F-2 or S-2 building no more than one-story in height, ~~Group F-2 or S-2 building~~ shall not be limited when the building is surrounded and adjoined by public ways or yards not less than 60 feet (18 288 mm) in width.

507.3 Sprinklered, one story. The area of a Group B, F, M or S building no more than one-story in height, ~~Group B, F, M or S building~~ or a Group A-4 building no more than one-story in height ~~Group A-4 building~~, of other than Type V construction, shall not be limited when the building is provided with an automatic sprinkler system throughout in accordance with Section 903.3.1.1 and is surrounded and adjoined by public ways or yards not less than 60 feet (18 288 mm) in width.

Exceptions:

1. Buildings and structures of Type I and II construction for rack storage facilities that do not have access by the public shall not be limited in height, provided that such buildings conform to the requirements of Sections 507.2 and 903.3.1.1 and NFPA 230.
2. The automatic sprinkler system shall not be required in areas occupied for indoor participant sports, such as tennis, skating, swimming and equestrian activities in occupancies in Group A-4, provided that:
 - 2.1. Exit doors directly to the outside are provided for occupants of the participant sports areas; and
 - 2.2. The building is equipped with a fire alarm system with manual fire alarm boxes installed in accordance with Section 907.
3. Group A-1 and A-2 occupancies of other than Type V construction shall be permitted, provided:
 - 3.1. All assembly occupancies are separated from other spaces as required for separated uses in Section 508.3.3.4 with no reduction allowed in the fire-resistance rating of the separation based upon the installation of an automatic sprinkler system;
 - 3.2. Each Group A occupancy shall not exceed the maximum allowable area permitted in Section 503.1; and
 - 3.3. All required exits shall discharge directly to the exterior.

507.4 Two story. The area of a Group B, F, M or S building no more than two stories in height ~~two-story, Group B, F, M or S building~~ shall not be limited when the building is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1, and is surrounded and adjoined by public ways or yards not less than 60 feet (18 288 mm) in width.

507.6 Group A-3 buildings. The area of a Group A-3 building no more than one-story in height, ~~Group A-3 building~~ used as a place of religious worship, community hall, dance hall, exhibition hall, gymnasium, lecture hall, indoor swimming pool or tennis court of Type II construction shall not be limited when all of the following criteria are met:

1. The building shall not have a stage other than a platform.
2. The building shall be equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.
3. The assembly floor shall be located at or within 21 inches (533 mm) of street or grade level and all exits are provided with ramps complying with Section 1010.1 to the street or grade level.
4. The building shall be surrounded and adjoined by public ways or yards not less than 60 feet (18 288 mm) in width.

507.7 Group H occupancies. Group H-2, H-3 and H-4 occupancies shall be permitted in unlimited area buildings containing Group F and S occupancies, in accordance with Sections 507.3 and 507.4 and the limitations of this section. The aggregate floor area of the Group H occupancies located at the perimeter of the unlimited area building shall not exceed 10 percent of the area of the building nor the area limitations for the Group H occupancies as specified in Table 503 as modified by Section 506.2, based upon the percentage of the perimeter of each Group H fire area that fronts on a street or other unoccupied space. The aggregate floor area of Group H occupancies not located at the perimeter of the building shall not exceed 25 percent of the area limitations for the Group H occupancies as specified in Table 503. Group H fire areas shall be separated from the rest of the unlimited area building and from each other in accordance with Table 508.3.3 For two-story unlimited area buildings, the Group H fire areas shall not be located ~~above the first~~ more than one story above grade plane unless permitted by the allowable height in stories and feet as set forth in Table 503 based on the type of construction of the unlimited area building.

507.8 Aircraft paint hangar. The area of a Group H-2 aircraft paint hangar no more than one-story in height, ~~Group H-2 aircraft paint hangar~~ shall not be limited where such aircraft paint hangar complies with the provisions of Section 412.4 and is entirely surrounded by public ways or yards not less in width than one and one-half times the height of the building.

507.9 Group E buildings. The area of a Group E building no more than one-story in height, ~~Group E building~~ of Type II, IIIA or IV construction shall not be limited when the following criteria are met:

1. Each classroom shall have not less than two means of egress, with one of the means of egress being a direct exit to the outside of the building complying with Section 1018.
2. The building is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.
3. The building is surrounded and adjoined by public ways or yards not less than 60 feet (18 288 mm) in width.

507.10 Motion picture theaters. In buildings of Type II construction, the area of a ~~one-story~~ motion picture theater located on the first story above grade plane shall not be limited when the building is provided with an automatic sprinkler system throughout in accordance with Section 903.3.1.1 and is surrounded and adjoined by public ways or yards not less than 60 feet (18 288 mm) in width.

509.3 Group S-2 enclosed parking garage with Group S-2 open parking garage above. A Group S-2 enclosed parking garage located ~~in the basement or first~~ no more than one story above grade plane, and located below a Group S-2 open parking garage shall be classified as a separate and distinct building for the purpose of determining the type of construction when the following conditions are met:

1. The allowable area of the structure shall be such that the sum of the ratios of the actual area divided by the allowable area for each separate occupancy shall not exceed 1.0.
2. The Group S-2 enclosed parking garage is of Type I or II construction and is at least equal to the fire-resistance requirements of the Group S-2 open parking garage.
3. The height and the number of the floors above the basement shall be limited as specified in Table 406.3.5.
4. The floor assembly separating the Group S-2 enclosed parking garage and Group S-2 open parking garage shall be protected as required for the floor assembly of the Group S-2 enclosed parking garage. Openings between the Group S-2 enclosed parking garage and Group S-2 open parking garage, except exit openings, shall not be required to be protected.
5. The Group S-2 enclosed parking garage is used exclusively for the parking or storage of private motor vehicles, but shall be permitted to contain an office, waiting room and toilet room having a total area of not more than 1,000 square feet (93 m²), and mechanical equipment rooms incidental to the operation of the building.

509.8 Group B or M with Group S-2 open parking garage above. Group B or M uses located in the basement or first story above grade plane below a Group S-2 open parking garage shall be classified as a separate and distinct building for the purpose of determining the type of construction when all of the following conditions are met:

1. The basement or first story above grade plane shall be Type I or II construction, but not less than the type of construction required for the open parking garage above. The height and area of the basement or first story shall not exceed the limitations in Section 503 for the Group B or M uses.
2. The height and area of the open parking garage shall not exceed the limitations permitted under Section 406.3. The height, in both feet and stories, of the open parking garage shall be measured from grade plane and include both the open parking garage and the basement or first story above grade plane.
3. Fire separation assemblies between the open parking garage and the basement or first story above grade plane use group occupancy shall correspond to the required fire-resistance rating prescribed by Table 508.3.3
4. Exits serving the open parking garage shall discharge directly to a street or public way and shall be separated from the basement or first story above grade plane use group occupancy by not less than 2-hour fire barriers constructed in accordance with Section 706 or 2-hour horizontal assemblies constructed in accordance with Section 711, or both, with opening protectives in accordance with Table 715.4.

[F] 903.2.8.1 Repair garages. An automatic sprinkler system shall be provided throughout all buildings used as repair garages in accordance with Section 406, as shown:

1. Buildings having two or more stories in height, including basements, with a fire area containing a repair garage exceeding 10,000 square feet (929 m²).
2. ~~One-story buildings~~ Buildings no more than one story in height, with a fire area containing a repair garage exceeding 12,000 square feet (1115 m²).
3. Buildings with a repair garage servicing vehicles parked in the basement.

[F] 903.2.10.1 Stories and basements without openings. An automatic sprinkler system shall be installed throughout all stories, including basements, ~~every story or basement~~ of all buildings where the floor area exceeds 1,500 square feet (139.4m²) and where there is not provided at least one of the following types of exterior wall openings:

1. Openings below grade that lead directly to ground level by an exterior stairway complying with Section 1009 or an outside ramp complying with Section 1010. Openings shall be located in each 50 linear feet (15 240 mm), or fraction thereof, of exterior wall in the story on at least one side.
2. Openings entirely above the adjoining ground level totaling at least 20 square feet (1.86 m²) in each 50 linear feet (15 240 mm), or fraction thereof, of exterior wall in the story on at least one side.

1009.11 Stairway to roof. In buildings ~~located~~ four or more stories in height ~~above grade plane~~, one stairway shall extend to the roof surface, unless the roof has a slope steeper than four units vertical in 12 units horizontal (33-percent slope). In buildings without an occupied roof, access to the roof from the top story shall be permitted to be by an alternating tread device.

1020.1 Enclosures required. Interior exit stairways and interior exit ramps shall be enclosed with fire barriers constructed in accordance with Section 706 or horizontal assemblies constructed in accordance with Section 711, or both. Exit enclosures shall have a fire-resistance rating of not less than 2 hours where connecting four stories or more and not less than 1 hour where connecting less than four stories. The number of stories connected by the exit enclosure shall include any basements but not any mezzanines. An exit enclosure shall not be used for any purpose other than means of egress.

Exceptions:

1. In all occupancies, other than Group H and I occupancies, a stairway is not required to be enclosed when the stairway serves an occupant load of less than 10 and the stairway complies with either Item 1.1 or 1.2. In all cases, the maximum number of connecting open stories shall not exceed two.
 - 1.1. The stairway is open to not more than one story above the story at the level of exit discharge; or
 - 1.2. The stairway is open to not more than one story below the story at the level of exit discharge.
2. Exits in buildings of Group A-5 where all portions of the means of egress are essentially open to the outside need not be enclosed.
3. Stairways serving and contained within a single residential dwelling unit or sleeping unit in Group R-1, R-2 or R-3 occupancies are not required to be enclosed.

4. Stairways that are not a required means of egress element are not required to be enclosed where such stairways comply with Section 707.2.
5. Stairways in open parking structures that serve only the parking structure are not required to be enclosed.
6. Stairways in Group I-3 occupancies, as provided for in Section 408.3.6, are not required to be enclosed.
7. Means of egress stairways as required by Section 410.5.3 are not required to be enclosed.
8. In other than Group H and I occupancies, a maximum of 50 percent of egress stairways serving one adjacent floor are not required to be enclosed, provided at least two means of egress are provided from both floors served by the unenclosed stairways. Any two such interconnected floors shall not be open to other floors. Unenclosed exit stairways shall be remotely located as required in Section 1015.2.
9. In other than Group H and I occupancies, interior egress stairways serving only the first and second stories above grade plane of a building equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 are not required to be enclosed, provided at least two means of egress are provided from both floors served by the unenclosed stairways. Such interconnected stories shall not be open to other stories. Unenclosed exit stairways shall be remotely located as required in Section 1015.2.

502.1 Definitions.

BASEMENT. ~~That portion of a building that is partly or completely below grade plane (see “Story above grade plane” in Section 202). A basement shall be considered as~~ A story that is not a story above grade plane (See “Story above grade plane” in Section 202) ~~where the finished surface of the floor above the basement is:~~

- ~~1. More than 6 feet (1829 mm) above grade plane; or~~
- ~~2. More than 12 feet (3658 mm) above the finished ground level at any point.~~

SECTION 202 DEFINITIONS

STORY. That portion of a building included between the upper surface of a floor and the upper surface of the floor or roof next above (also see “Basement”, “Mezzanine” and Section 502.1). It is measured as the vertical distance from top to top of two successive tiers of beams or finished floor surfaces and, for the topmost story, from the top of the floor finish to the top of the ceiling joists or, where there is not a ceiling, to the top of the roof rafters.

STORY ABOVE GRADE PLANE. Any story having its finished floor surface entirely above grade plane, ~~except that a basement shall be considered as a story above grade plane or in which~~ where the finished surface of the floor above the basement is:

1. More than 6 feet (1829 mm) above grade plane; or
2. More than 12 feet (3658 mm) above the finished ground level at any point.

Reason: The purpose of this proposal is to clarify the use of the term “basement” in the IBC.

Part 1 of the proposal makes several corrections to the use of terms.

It clarifies what is meant when the code uses “one-story building”, “two-story building”, “first story”, and similar phrases. “Story” is defined as “That portion of a building included between the upper surface of a floor and the upper surface of the floor or roof next above”. According to this definition, basements are stories. This proposal revises several code sections to clarify that, when the codes uses ‘buildings with one (or two) stories in height’, or similar term, only stories above grade plane are counted. According to the current code language, a building with one basement and one story above grade plane would be considered a two-story building; according to this proposal, it would be a single-story building.

In Part 1 of this proposal, we have chosen to use the term “stories in height” instead of “stories above grade plane”. “Stories in height” is less awkward, and it is currently used many places in the code. “Stories in height” conveys the same meaning as “stories above grade plane”. It refers to the number of stories allowed by Table 503, which is measured in stories above grade plane. If “stories above grade plane” were to be used instead, many more code sections would require revisions. The important issue is to use one term consistently throughout the code.

Unnecessary language is removed from Section 506.1.1, since Part 1 clarified that basements are not stories above grade plane.

Note that this proposal deals only with Chapters 1 through 10. Changes to other chapters can be proposed in the next code cycle.

Part 2 of the proposal revises the definitions of “basement” and “story above grade plane”. Section 202 defines the term “basement” as a portion of a building that is at least partly below grade plane. The definition doesn’t specify a minimum amount of the portion that’s below grade plane, or how far below grade plane. A portion of a building that has one corner located one foot below grade plane is, therefore, a basement according to the current definition. The definition contains a discussion of when a basement is considered a story above grade plane, but that discussion doesn’t affect the determination of whether a portion of a building is a basement. A portion of a building can be both a basement and a story above grade plane. This proposal makes “basement” and “story above grade plane” mutually-exclusive terms.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: For consistency in the code, the General Committee will make the determination for entire proposal.

Public Hearing Results

Committee Action:

Approved as Modified

Modify the proposal as follows:

507.3 Sprinklered, one story. The area of a Group B, F, M or S building no more than one-story in height, or a Group A-4 building no more than one-story in height, of other than Type V construction, shall not be limited when the building is provided with an automatic sprinkler system throughout in accordance with Section 903.3.1.1 and is surrounded and adjoined by public ways or yards not less than 60 feet (18 288 mm) in width.

Exceptions:

- 1. Buildings and structures of Type I and II construction for rack storage facilities that do not have access by the public shall not be limited in height, provided that such buildings conform to the requirements of Sections 507.2 and 903.3.1.1 and NFPA 230.
- 2. The automatic sprinkler system shall not be required in areas occupied for indoor participant sports, such as tennis, skating, swimming and equestrian activities in occupancies in Group A-4, provided that:
 - 2.1. Exit doors directly to the outside are provided for occupants of the participant sports areas; and
 - 2.2. The building is equipped with a fire alarm system with manual fire alarm boxes installed in accordance with Section 907.
- 3. Group A-1 and A-2 occupancies of other than Type V construction shall be permitted, provided:
 - 3.1. All assembly occupancies are separated from other spaces as required for separated uses in Section 508.3.3.4 with no reduction allowed in the fire-resistance rating of the separation based upon the installation of an automatic sprinkler system;
 - 3.2. Each Group A occupancy shall not exceed the maximum allowable area permitted in Section 503.1; and
 - 3.3. All required exits shall discharge directly to the exterior.

STORY ABOVE GRADE PLANE. Any story having its finished floor surface entirely above grade plane, or in which the finished surface of the floor above is:

- 1. More than 6 feet (1829 mm) above grade plane; or
- 2. More than 12 feet (3658 mm) above the finished ground level at any point.

(Portions of proposal not shown remain unchanged)

Committee Reason: This proposal clarified the use of the term basement throughout the code. See also the proponents reason. The first amendment to Section 507.3 was based upon a concern with grammar. The modification retains commas that were initially struck out. The second amendment places the term above back in the definition of story above grade plane to retain the intent of the definition.

Assembly Action:

None

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Maureen Traxler, City of Seattle, WA, Department of Planning and Development, requests Approval as Modified by this public comment.

Further modify proposal as follows:

[F] 415.6.2.1.1 Height exception. Where storage tanks are located within ~~only~~ a building no more than one story ~~in height~~ above grade plane, the height limitation of Section 503 shall not apply for Group H.

505.4 Openness. A mezzanine shall be open and unobstructed to the room in which such mezzanine is located except for walls not more than 42 inches (1067 mm) high, columns and posts.

Exceptions:

- 1. Mezzanines or portions thereof are not required to be open to the room in which the mezzanines are located, provided that the occupant load of the aggregate area of the enclosed space does not exceed 10.
- 2. A mezzanine having two or more means of egress is not required to be open to the room in which the mezzanine is located if at least one of the means of egress provides direct access to an exit from the mezzanine level.
- 3. Mezzanines or portions thereof are not required to be open to the room in which the mezzanines are located, provided that the aggregate floor area of the enclosed space does not exceed 10 percent of the mezzanine area.
- 4. In industrial facilities, mezzanines used for control equipment are permitted to be glazed on all sides.
- 5. In other than Groups H and I occupancies no more than two stories ~~in height~~ above grade plane and equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1, a mezzanine having two or more means of egress shall not be required to be open to the room in which the mezzanine is located.

507.3 Sprinklered, one story. The area of a Group B, F, M or S building no more than one-story ~~in height~~ above grade plane or a Group A-4 building no more than one-story ~~in height~~ above grade plane of other than Type V construction, shall not be limited when the building is provided with an automatic sprinkler system throughout in accordance with Section 903.3.1.1 and is surrounded and adjoined by public ways or yards not less than 60 feet (18 288 mm) in width.

Exceptions:

1. Buildings and structures of Type I and II construction for rack storage facilities that do not have access by the public shall not be limited in height, provided that such buildings conform to the requirements of Sections 507.2 and 903.3.1.1 and NFPA 230.
2. The automatic sprinkler system shall not be required in areas occupied for indoor participant sports, such as tennis, skating, swimming and equestrian activities in occupancies in Group A-4, provided that:
 - 2.1. Exit doors directly to the outside are provided for occupants of the participant sports areas; and
 - 2.2. The building is equipped with a fire alarm system with manual fire alarm boxes installed in accordance with Section 907.
3. Group A-1 and A-2 occupancies of other than Type V construction shall be permitted, provided:
 - 3.1. All assembly occupancies are separated from other spaces as required for separated uses in Section 508.3.3.4 with no reduction allowed in the fire-resistance rating of the separation based upon the installation of an automatic sprinkler system;
 - 3.2. Each Group A occupancy shall not exceed the maximum allowable area permitted in Section 503.1; and
 - 3.3. All required exits shall discharge directly to the exterior.

507.4 Two story. The area of a Group B, F, M or S building no more than two stories in height above grade plane shall not be limited when the building is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1, and is surrounded and adjoined by public ways or yards not less than 60 feet (18 288 mm) in width.

507.6 Group A-3 buildings. The area of a Group A-3 building no more than one-story in height above grade plane used as a place of religious worship, community hall, dance hall, exhibition hall, gymnasium, lecture hall, indoor swimming pool or tennis court of Type II construction shall not be limited when all of the following criteria are met:

1. The building shall not have a stage other than a platform.
2. The building shall be equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.
3. The assembly floor shall be located at or within 21 inches (533 mm) of street or grade level and all exits are provided with ramps complying with Section 1010.1 to the street or grade level.
4. The building shall be surrounded and adjoined by public ways or yards not less than 60 feet (18 288 mm) in width.

507.8 Aircraft paint hangar. The area of a Group H-2 aircraft paint hangar no more than one-story in height above grade plane, shall not be limited where such aircraft paint hangar complies with the provisions of Section 412.4 and is entirely surrounded by public ways or yards not less in width than one and one-half times the height of the building.

507.9 Group E buildings. The area of a Group E building no more than one-story in height above grade plane, of Type II, IIIA or IV construction shall not be limited when the following criteria are met:

1. Each classroom shall have not less than two means of egress, with one of the means of egress being a direct exit to the outside of the building complying with Section 1018.
2. The building is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.
3. The building is surrounded and adjoined by public ways or yards not less than 60 feet (18 288 mm) in width.

509.8 Group B or M with Group S-2 open parking garage above. Group B or M uses located in the basement or first story above grade plane below a Group S-2 open parking garage shall be classified as a separate and distinct building for the purpose of determining the type of construction when all of the following conditions are met:

1. The basement or first story above grade plane shall be Type I or II construction, but not less than the type of construction required for the open parking garage above. The height and area of the basement or first story shall not exceed the limitations in Section 503 for the Group B or M uses.
2. The height and area of the open parking garage shall not exceed the limitations permitted under Section 406.3. The height, in both feet and stories, of the open parking garage shall be measured from grade plane and include both the open parking garage and the basement or first story above grade plane.
3. Fire separation assemblies between the open parking garage and the occupancy located in the basement or on the first story above grade plane shall correspond to the required fire-resistance rating prescribed by Table 508.3.3.
4. Exits serving the open parking garage shall discharge directly to a street or public way and shall be separated from the occupancy located in the basement or on the first story above grade plane by not less than 2-hour fire barriers constructed in accordance with Section 706 or 2-hour horizontal assemblies constructed in accordance with Section 711, or both, with opening protectives in accordance with Table 715.4.

[F] 903.2.8.1 Repair garages. An automatic sprinkler system shall be provided throughout all buildings used as repair garages in accordance with Section 406, as shown:

1. Buildings having two or more stories above grade plane, including basements, with a fire area containing a repair garage exceeding 10,000 square feet (929 m²).
2. Buildings no more than one story in height above grade plane, with a fire area containing a repair garage exceeding 12,000 square feet (1115 m²).
3. Buildings with a repair garage servicing vehicles parked in the basement.

1009.11 Stairway to roof. In buildings four or more stories in height above grade plane, one stairway shall extend to the roof surface, unless the roof has a slope steeper than four units vertical in 12 units horizontal (33-percent slope). In buildings without an occupied roof, access to the roof from the top story shall be permitted to be by an alternating tread device.

(Portions of proposal not shown remain unchanged)

Commenter's Reason: These modifications are proposed for the sake of consistency with the Code Development Committee action on G6-06/07. G6-06/07 changed several code sections from "...stories in height" to "...stories above grade plane". Together, G6-06/07 and G8-06/07 clarify that when the number of stories is used to trigger a code requirement in the affected sections, the code is referring to the number of stories above grade plane.

Final Hearing Results

G8-06/07

AMPC1

Code Change No: **G9-06/07**

Original Proposal

Sections: [F] 415.6.2.1, 505.5, 507.7, 508.3.3.3, 706.7, 3410.6.1.1 (IEBC [B] 1301.6.1.1), 3410.6.2.2 (IEBC [B] 1301.6.2.2), 3410.6.4.1 (IEBC [B] 1301.6.4.1), 3410.6.8.1 (IEBC [B] 1301.6.8.1), 3410.6.10.1 (IEBC [B] 1301.6.10.1), 3410.6.18 (IEBC [B] 1301.6.19), 702.1, 902.1

Proponent: Gregory R. Keith, Professional heuristic Development, representing the Boeing Company

Revise as follows:

[F] 415.6.2.1 Mixed occupancies. Where the storage tank area is located in a building of two or more occupancies, and the quantity of liquid exceeds the maximum allowable quantity for one control area, the use shall be completely separated from adjacent ~~fire areas~~ occupancies in accordance with the requirements of Section 508.3.3.

504.2 Automatic sprinkler system increase. Where a building is equipped throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.1, the value specified in Table 503 for maximum height is increased by 20 feet (6096 mm) and the maximum number of stories is increased by one. These increases are permitted in addition to the area increase in accordance with Sections 506.2 and 506.3. For Group R buildings equipped throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.2, the value specified in Table 503 for maximum height is increased by 20 feet (6096 mm) and the maximum number of stories is increased by one, but shall not exceed 60 feet (18 288 mm) or four stories, respectively.

Exceptions:

1. ~~Fire areas~~ Buildings with an occupancy in Group I-2 occupancy of Type IIB, III, IV or V construction.
2. ~~Fire areas~~ Buildings with an occupancy in Group H-1, H-2, H-3 or H-5 occupancy.
3. Fire-resistance rating substitution in accordance with Table 601, Note e.

505.5 Equipment platforms. Equipment platforms in buildings shall not be considered as a portion of the floor below. Such equipment platforms shall not contribute to either the building area or the number of stories as regulated by Section 503.1. The area of the equipment platform shall not be included in determining the fire area in accordance with Section 903. Equipment platforms shall not be a part of any mezzanine and such platforms and the walkways, stairs and ladders providing access to an equipment platform shall not serve as a part of the means of egress from the building.

507.7 Group H occupancies. Group H-2, H-3 and H-4 occupancies shall be permitted in unlimited area buildings containing Group F and S occupancies, in accordance with Sections 507.3 and 507.4 and the limitations of this section. The aggregate floor area of the Group H occupancies located at the perimeter of the unlimited area building shall not exceed 10 percent of the area of the building nor the area limitations for the Group H occupancies as specified in Table 503 as modified by Section 506.2, based upon the percentage of the perimeter of each Group H ~~fire floor~~ area that fronts on a street or other unoccupied space. The aggregate floor area of Group H occupancies not located at the perimeter of the building shall not exceed 25 percent of the area limitations for the Group H occupancies as specified in Table 503. Group H ~~fire areas~~ occupancies shall be separated from the rest of the unlimited area building and from each other in accordance with Table 508.3.3 For two-story unlimited area buildings, the Group H ~~fire areas~~ occupancies shall not be located above the first story unless permitted by the allowable height in stories and feet as set forth in Table 503 based on the type of construction of the unlimited area building.

508.3.3.3 Allowable height. Each occupancy shall comply with the height limitations based on the type of construction of the building in accordance with Section 503.1. The height, in both feet and stories, of each ~~fire floor~~ area shall be measured from grade plane. This measurement shall include the height, in both feet and stories, of intervening ~~fire floor~~ areas.

Exception: Special provisions permitted by Section 509.

706.6 Openings. Openings in a fire barrier shall be protected in accordance with Section 715. Openings shall be limited to a maximum aggregate width of 25 percent of the length of the wall, and the maximum area of any single opening shall not exceed 156 square feet (15m²). Openings in exit enclosures and exit passageways shall also comply with Sections 1020.1.1 and 1021.4, respectively.

Exceptions:

1. Openings shall not be limited to 156 square feet (15 m²) where adjoining ~~fire~~ floor areas are equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.
2. Fire doors serving an exit enclosure.
3. Openings shall not be limited to 156 square feet (15m²) or an aggregate width of 25 percent of the length of the wall where the opening protective assembly has been tested in accordance with ASTM E119 and has a minimum fire-resistance rating not less than the fire-resistance rating of the wall.
4. Fire windows permitted in atrium separation walls shall not be limited to a maximum aggregate width of 25 percent of length of the wall.

3410.6.1.1 (IEBC 1301.6.1.1) Height formula. The following formulas shall be used in computing the building height value.

$$\text{Height value, feet} = \frac{(AH) - (EBH)}{12.5} \sim xCF$$

$$\text{Height, value, stories} = (AS - EBS) \times CF$$

(Equation 34-1)

where:

AH = Allowable height in feet from Table 503.

EBH = Existing building height in feet.

AS = Allowable height in stories from Table 503.

EBS = Existing building height in stories.

CF = 1 if *(AH) - (EBH)* is positive.

CF = Construction-type factor shown in Table 3410.6.6(2) if *(AH) - (EBH)* is negative.

Note: Where mixed occupancies are separated and individually evaluated as indicated in Section 3410.6, the values *AH*, *AS*, *EBH* and *EBS* shall be based on the height of the ~~fire area of the~~ occupancy being evaluated.

3410.6.2.2 (IEBC 1301.6.2.2) Area formula. The following formula shall be used in computing the area value. Determine the area value for each occupancy ~~fire~~ floor area on a floor-by-floor basis. For each occupancy, choose the minimum area value of the set of values obtained for the particular occupancy.

(Equation 34-3 does not change)

3410.6.4.1 (IEBC 1301.6.4.1) Categories. The categories for tenant and dwelling unit separations are:

1. Category a — No fire partitions; incomplete fire partitions; no doors; doors not self-closing or automatic closing.
2. Category b—Fire partitions or floor assembly less than 1-hour fire-resistance rating or not constructed in accordance with Sections 708 or 711, respectively.
3. Category c—Fire partitions with 1 hour or greater fire-resistance rating constructed in accordance with Section 708 and floor assemblies with 1-hour but less than 2-hour fire-resistance rating constructed in accordance with Section 711, or with only one tenant within the ~~fire~~ floor area.
4. Category d — Fire barriers with 1-hour but less than 2-hour fire-resistance rating constructed in accordance with Section 706 and floor assemblies with 2-hour or greater fire-resistance rating constructed in accordance with Section 711.
5. Category e — Fire barriers and floor assemblies with 2-hour or greater fire-resistance rating and constructed in accordance with Sections 706 and 711, respectively.

3410.6.8.1 (IEBC 1301.6.8.1) Categories. The categories for automatic fire detection are:

1. Category a — None.
2. Category b— Existing smoke detectors in HVAC systems and maintained in accordance with the *International Fire Code*.

3. Category c—Smoke detectors in HVAC systems. The detectors are installed in accordance with the requirements for new buildings in the *International Mechanical Code*.
4. Category d — Smoke detectors throughout all floor areas other than individual sleeping units, tenant spaces and dwelling units.
5. Category e—Smoke detectors installed throughout the ~~fire~~ floor area.

3410.6.10.1 (IEBC 1301.6.10.1) Categories. The categories for smoke control are:

1. Category a — None.
2. Category b — The building is equipped throughout with an automatic sprinkler system. Openings are provided in exterior walls at the rate of 20 square feet (1.86 m²) per 50 linear feet (15 240 mm) of exterior wall in each story and distributed around the building perimeter at intervals not exceeding 50 feet (15 240 mm). Such openings shall be readily openable from the inside without a key or separate tool and shall be provided with ready access thereto. In lieu of operable openings, clearly and permanently marked tempered glass panels shall be used.
3. Category c — One enclosed exit stairway, with ready access thereto, from each occupied floor of the building. The stairway has operable exterior windows and the building has openings in accordance with Category b.
4. Category d—One smokeproof enclosure and the building has openings in accordance with Category b.
5. Category e — The building is equipped throughout with an automatic sprinkler system. Each ~~fire~~ floor area is provided with a mechanical air-handling system designed to accomplish smoke containment. Return and exhaust air shall be moved directly to the outside without recirculation to other ~~fire~~ floor areas of the building under fire conditions. The system shall exhaust not less than six air changes per hour from the ~~fire~~ floor area. Supply air by mechanical means to the ~~fire~~ floor area is not required. Containment of smoke shall be considered as confining smoke to the fire area involved without migration to other ~~fire~~ floor areas. Any other tested and approved design which will adequately accomplish smoke containment is permitted.
6. Category f—Each stairway shall be one of the following: a smokeproof enclosure in accordance with Section 1020.1.7; pressurized in accordance with Section 909.20.5; or shall have operable exterior windows.

3410.6.18 (IEBC 1301.6.19) Incidental use. Evaluate the protection of incidental use areas in accordance with Section 508.2. Do not include those where this code requires suppression throughout the building including covered mall buildings, high-rise buildings, public garages and unlimited area buildings. Assign the lowest score from Table 3410.6.18 for the building or ~~fire~~ floor area being evaluated. If there are no specific occupancy areas in the building or ~~fire~~ floor area being evaluated, the value shall be zero.

2. Delete without substitution:

702.1 Definitions. The following words and terms shall, for the purposes of this chapter, and as used elsewhere in this code, have the meanings shown herein.

~~**FIRE AREA.** The aggregate floor area enclosed and bounded by fire walls, fire barriers, exterior walls or fire-resistance-rated horizontal assemblies of a building.~~

3. Add new text as follows:

902.1 Definitions. The following words and terms shall, for the purposes of this chapter, and as used elsewhere in this code, have the meanings shown herein.

FIRE AREA. The aggregate floor area enclosed and bounded by fire walls, fire barriers, exterior walls or fire-resistance-rated horizontal assemblies of a building.

Reason: The term “fire area” has a very specific purpose with respect to the application of IBC provisions. In proper context, the term fire area serves to define the spatial boundaries for automatic sprinkler system and other active fire protection requirement threshold determination purposes in Chapter 9. The term also occurs in several chapters other than Chapter 9 in the IBC. Unfortunately, most of those references are out of context; and therefore, tend to be confusing to code users.

To clarify the matter, it is proposed to move the definition of fire area from Chapter 7 to Chapter 9. Speaking against the current location in Chapter 7, those provisions applicable to fire areas in Chapter 7 only deal with construction details for fire barriers and horizontal assemblies separating fire areas and have nothing to do with their actual purpose or function. Please note that the definition for “control area” is not located in Chapter 7; but rather, located in context at Chapter 3.

Most of the erroneous fire area provisions outside of Chapter 9 are building or floor area references. Those provisions have been identified and corrected. This clarification will benefit those attempting to correctly identify code requirements. An example occurs at Section 3410.6.8.1. In that section, Category e identifies, “Smoke detectors installed throughout the fire area.” Meanwhile, Category d states, “Smoke detectors throughout all floor areas other than individual sleeping units, tenant spaces and dwelling units.” Category e should also reference floor area.

Certain interpreters may react to an incorrect fire area reference by requiring a fire barrier or horizontal assembly to surround an ordinary floor area in a sprinklered building only because those assemblies are contained in the definition of fire area. This proposed code change will clarify the code and eliminate the possibility of such confusing and inappropriate interpretations.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:**Approved as Modified****Modify the proposal as follows:**

504.2 Automatic sprinkler system increase. Where a building is equipped throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.1, the value specified in Table 503 for maximum height is increased by 20 feet (6096 mm) and the maximum number of stories is increased by one. These increases are permitted in addition to the area increase in accordance with Sections 506.2 and 506.3. For Group R buildings equipped throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.2, the value specified in Table 503 for maximum height is increased by 20 feet (6096 mm) and the maximum number of stories is increased by one, but shall not exceed 60 feet (18 288 mm) or four stories, respectively.

Exceptions:

1. Buildings ~~with, or portions of buildings, classified as a~~ Group I-2 occupancy of Type IIB, III, IV or V construction.
2. Buildings ~~with, or portions of buildings, classified as a~~ Group H-1, H-2, H-3 or H-5 occupancy.
3. Fire-resistance rating substitution in accordance with Table 601, Note e.

(Portions of proposal not shown remain unchanged)

Committee Reason: The code change cleans up the code to correlate with the changes in the mixed occupancy requirements. More specifically separating the concept of fire areas from determination of allowable height and area. The modification was to clarify within the exception that it may be an entire building or only a portion of a building with an occupancy classification that are prohibited from increasing building height. The original proposal would have limited any building containing such occupancies to the heights indicated in Table 503.

Assembly Action:**None**

Final Hearing Results

G9-06/07**AM**

Code Change No: G25-06/07

Original Proposal

Section: 110.1

Proponent: Rebecca Baker, Jefferson County, CO, Chair, ICC Ad Hoc Committee on the Administrative Provisions in the I-Codes (AHC-Admin)

Revise as follows:

110.1 Use and occupancy. No building or structure shall be used or occupied, and no change in the existing occupancy classification of a building or structure or portion thereof shall be made until the building official has issued a certificate of occupancy therefor as provided herein. Issuance of a certificate of occupancy shall not be construed as an approval of a violation of the provisions of this code or of other ordinances of the jurisdiction. Certificates presuming to give authority to violate or cancel the provisions of this code or other ordinances of the jurisdiction shall not be valid.

Exceptions:

1. Certificates of occupancy are not required for work exempt from permits under Section 105.2.
2. Accessory buildings or structures.

Reason: Consistency and coordination among the I-Codes is one of the cornerstones of the ICC Code Development Process. This holds true for not only the technical code provisions but also for the administrative code provisions as contained in Chapter 1 of all the I-Codes.

In response to concerns raised by the ICC membership since publication of the first editions of the I-Codes, the ICC Board established the Ad Hoc Committee on the Administrative Provisions in the I-Codes (AHC-Admin) to review Chapter 1 administrative provisions in each code in the International Codes family, improve their correlation among the I-Codes through the code development process and recommend to the ICC Board the mechanism by which code development maintenance of the continuing coordination of administrative provisions can best be achieved.

CODE CHANGES RESOURCE COLLECTION – INTERNATIONAL BUILDING CODE

The AHC-Admin is submitting a series of code change proposals designed to provide consistent and correlated administrative provisions among the I-Codes using existing I-Code texts, as noted. While some proposed text may be “new” to this code, it is not new to the I-Code family, since it already exists in one or more of the International Codes, unless otherwise noted. A comparative matrix of current I-Codes Chapter 1 text may be found on the ICC website at www.iccsafe.org/cs/cc/admin/index.html.

The purpose of this proposed change is to provide correlation with Section 110.1 of the *International Residential Code*. The added text in this section will make it clear that though the certificate of occupancy is the legal notification from the department that the building may be occupied for its intended purpose the granting of a certificate of occupancy may not be construed as indicating that no violations of the code or other jurisdictional laws exist if, in fact they do. Any certificate that would imply such approval would be considered void. The added exceptions make it clear that certain work and structures do not need a certificate.

A similar proposal has also been submitted to Section 110.1 of the *International Existing Building Code*.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Modified

Modify the proposal as follows:

110.1 Use and occupancy. No building or structure shall be used or occupied, and no change in the existing occupancy classification of a building or structure or portion thereof shall be made until the building official has issued a certificate of occupancy therefor as provided herein. Issuance of a certificate of occupancy shall not be construed as an approval of a violation of the provisions of this code or of other ordinances of the jurisdiction. ~~Certificates presuming to give authority to violate or cancel the provisions of this code or other ordinances of the jurisdiction shall not be valid.~~

Exceptions:

1. Certificates of occupancy are not required for work exempt from permits under Section 105.2.
- ~~2. Accessory buildings or structures.~~

Committee Reason: The language was felt to be an improvement to the code to clarify that certificates of occupancy are not required in some cases. The modification deleted wording that is addressed elsewhere in the code and to delete the 2nd exception as the term Accessory® is not defined and could potentially cause confusion.

Assembly Action:

None

Final Hearing Results

G25-06/07

AM

Code Change No: G26-06/07

Original Proposal

Section 111.3

Proponent: Rebecca Baker, Jefferson County, CO, Chair, ICC Ad Hoc Committee on the Administrative Provisions in the I-Codes (AHC-Admin)

Revise as follows:

111.3 Authority to disconnect service utilities. The building official shall have the authority to authorize disconnection of utility service to the building, structure or system regulated by this code and ~~the codes referenced~~ the referenced codes and standards set forth in Section 102.4 in case of emergency where necessary to eliminate an immediate hazard to life or property or when such utility connection has been made without the approval required by Section 111.1 or 111.2. The building official shall notify the serving utility, and wherever possible the owner and occupant of the building, structure or service system of the decision to disconnect prior to taking such action. If not notified prior to disconnecting, the owner or occupant of the building, structure or service system shall be notified in writing, as soon as practical thereafter.

Reason: Consistency and coordination among the I-Codes is one of the cornerstones of the ICC Code Development Process. This holds true for not only the technical code provisions but also for the administrative code provisions as contained in Chapter 1 of all the I-Codes.

In response to concerns raised by the ICC membership since publication of the first editions of the I-Codes, the ICC Board established the Ad Hoc Committee on the Administrative Provisions in the I-Codes (AHC-Admin) to review Chapter 1 administrative provisions in each code in the International Codes family, improve their correlation among the I-Codes through the code development process and recommend to the ICC Board the mechanism by which code development maintenance of the continuing coordination of administrative provisions can best be achieved.

The AHC-Admin is submitting a series of code change proposals designed to provide consistent and correlated administrative provisions among the I-Codes using existing I-Code texts, as noted. While some proposed text may be "new" to this code, it is not new to the I-Code family, since it already exists in one or more of the International Codes, unless otherwise noted. A comparative matrix of current I-Codes Chapter 1 text may be found on the ICC website at www.iccsafe.org/cs/cc/admin/index.html.

The purpose of this proposal is to provide correlation with Section 111.3 of the *International Residential Code*. The added text will provide the code official with the needed authority to order that service utilities be disconnected the utility service has been connected without the necessary approvals required by the code. A similar proposal has been submitted to the *International Existing Building Code*.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Modified

Modify the proposal as follows:

111.3 Authority to disconnect service utilities. The building official shall have the authority to authorize disconnection of utility service to the building, structure or system regulated by this code and the referenced codes and standards set forth in Section ~~402.4-101.4~~ 101.4 in case of emergency where necessary to eliminate an immediate hazard to life or property or when such utility connection has been made without the approval required by Section 111.1 or 111.2. The building official shall notify the serving utility, and wherever possible the owner and occupant of the building, structure or service system of the decision to disconnect prior to taking such action. If not notified prior to disconnecting, the owner or occupant of the building, structure or service system shall be notified in writing, as soon as practical thereafter.

Committee Reason: The proposal was approved as it was felt to give more specific guidance on which standards were referenced. In addition this proposal now gives the building official the authority to disconnect power simply because the connection was made without prior approval. Currently the authority is only available when a hazard exists. The modification simply revises the section reference to 101.4 which gives a specific listing of codes versus a general section addressing referenced codes and standards.

Assembly Action:

None

Final Hearing Results

G26-06/07

AM

Code Change No: G30-06/07

Original Proposal

Section: 202

Proponent: Juli Case, Industrial Fabrics Association International

Revise definition as follows:

SECTION 202 DEFINITIONS

AWNING. An architectural fabric projection that provides weather protection, identity or decoration and is wholly supported by the building to which it is attached. An awning is comprised of a lightweight, ~~rigid skeleton~~ frame structure over which a covering is attached.

Reason: To clarify the code. The addition of the word "fabric" differentiates awnings made from fabrics and other pliable materials from those made of other building materials. The change from "lightweight rigid skeleton" structure to "lightweight frame" structure is a simplification of current verbiage.

Members of the Industrial Fabrics Association International, including the Lightweight Structures Association; the Professional Awning Manufacturers Association; the Tent Rental Division; and the Banner, Flag & Graphics Association, worked jointly on assessing terminology. Participants reflected backgrounds in engineering, architecture, end product manufacturing and component suppliers.

CODE CHANGES RESOURCE COLLECTION – INTERNATIONAL BUILDING CODE

The change reflected in the proposed definition is already being used in the membrane structure industry, having been published in the *Fabric Architecture* and *Industrial Fabric Products Review* magazines, published on the Professional Awning Manufacturers Association website, and used by the IFAI International Achievement Awards program.

Bibliography:

"By Any Other Name," *Industrial Fabric Products Review*, volume 91, Number 1, January 2006.
"A Defining Moment for Fabric Structures," *InTents*, volume 12, number 1, February/March 2005
"Defining the Basics," *InTents*, Volume 13, Number 1, February/March 2006
Professional Awning Manufacturers Association website, <http://www.awninginfo.com>
IFAI International Achievement Awards 2006 entry brochure

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Modified

Modify the proposal as follows:

AWNING. An architectural ~~fabrie~~ projection that provides weather protection, identity or decoration and is wholly supported by the building to which it is attached. An awning is comprised of a lightweight frame structure over which a covering is attached.

Committee Reason: The term ~~frame~~ which is more consistent with language throughout the code was preferred by the committee over the current terminology ~~Arigid skeleton~~. The committee approved of the modified version of the proposal which removed the term ~~fabric~~ which would have been limiting in application and retained the term ~~covering~~ which was more encompassing.

Assembly Action:

None

Final Hearing Results

G30-06/07

AM

Code Change No: G33-06/07

Original Proposal

Sections: 202; IEBC 202

Proponent: Philip Brazil, PE, Reid Middleton, Inc., representing himself

THIS PROPOSAL IS ON THE AGENDA OF THE IBC GENERAL AND IEBC CODE DEVELOPMENT COMMITTEES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IBC

Delete and substitute as follows:

**SECTION 202
DEFINITIONS**

~~**REGISTERED DESIGN PROFESSIONAL.** An individual who is registered or licensed to practice their respective design profession as defined by the statutory requirements of the professional registration laws of the state or jurisdiction in which the project is to be constructed.~~

REGISTERED DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE. A registered design professional engaged by the owner to review and coordinate certain aspects of the project, as determined by the building official, for compatibility with the design of the building or structure, including submittal documents prepared by others, deferred submittal documents and phased submittal documents.

PART II – IEBC

Add new text as follows:

**SECTION 202
DEFINITIONS**

REGISTERED DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE. A registered design professional engaged by the owner to review and coordinate certain aspects of the project, as determined by the building official, for compatibility with the design of the building or structure, including submittal documents prepared by others, deferred submittal documents and phased submittal documents.

Reason: This proposal is in response to Recommendation 28 of the “Final Report on the Collapse of the World Trade Center Towers” (NIST NCSTAR 1). The recommendation assumes that the IBC already defines “design professional in responsible charge,” which is not the case. This proposal will provide a definition in the IBC as well as the IEBC. Note that the term “registered design professional in responsible charge” is used throughout the IBC (i.e., Sections 106.3.4.1, 106.3.4.2, 1704.1, 1704.1.1, 1704.1.2, 1704.7, 1704.8, 1704.9, 1705.1, 1708.4, 1708.5, 1709.2 and 1709.3) as well as the IEBC. Note also that the term is typically not used in other codes published by the International Code Council. Specially, there are no instances of the term “registered design professional in responsible charge” in the 2003 IECC, IFC, IFGC, IMC, IPC or IRC.

The proposed definition is consistent with the role the IBC and IEBC currently specify for the registered design professional in responsible charge, which is typically the review and coordination of submittal documents prepared by others, deferred submittal documents and phased submittal documents for compatibility with the design of the building or structure. Refer to Section 106.3.4 in the IBC and IEBC for specific language.

A related proposal before the Structural Committee revises references to “registered design professional in responsible charge” in the structural chapters of the IBC to eliminate conflicts with Section 106.3.4. Sections 1704.7, 1704.8 and 1704.9 use “registered design professional in responsible charge” when referring to the registered design professional responsible for the structural design of a building or structure. Section 1708.5 uses the same term when referring to the registered design professional responsible for the structural design of a designated seismic system in a building or structure. Section 106.3.4.1, however, states that the registered design professional in responsible charge is “responsible for reviewing and coordinating submittal documents prepared by others, including phased and deferred submittal items, for compatibility with the design of the building.” Sections 1704.7, 1704.8, 1704.9 and 1708.5 are in conflict with Section 106.3.4.1 by using the same term for registered design professionals with responsibilities other than as specified in Section 106.3.4.1.

The IBC currently uses the term “registered design professional” in approximately 50 code sections, in addition to the code sections using the term “registered design professional in responsible charge.” “Registered design professional” refers to an individual responsible for an aspect of the design of a building or structure. Typical examples are the architect, structural engineer, mechanical engineer, electrical engineer, civil engineer, fire protection engineer and others. Referring, instead, to such an individual as a registered design professional in responsible charge is an exercise in stating the obvious. Such individuals are in responsible charge of their individual responsibilities in the design of the building or structure. The term “in responsible charge” is implicit in the term “registered design professional.”

The proposal before the Structural Committee will eliminate the conflict between Section 106.3.4, which assigns responsibilities to a registered design professional acting as the registered design professional in responsible charge of a project, and other sections of the IBC, which use the same term but do not intend that the responsibilities in Section 106.3.4 also apply.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: The term ‘registered design professional’ is currently in the definition section of the IBC, IRC, IFC, IPC, IMC, IFGC, IPSDC and the IZC. The Existing Building Committee will only hear if they want the definition in the IEBC. The decision for the wording of the definition will be the purview of the General Committee.

The General Committee will determine the wording of the definition. The IEBC committee will only be determining if this definition should also be included in Chapter 2 of the IEBC.

Public Hearing Results

PART I C IBC

Errata: Do not delete definition of registered design professional

Committee Action:

Approved as Submitted

Committee Reason: The committee felt that this definition was needed based upon its use throughout the code.

Assembly Action:

None

PART II C IEBC

Committee Action:

Approved as Submitted

Committee Reason: The definition of Registered Design Professional in Responsible Charge is appropriate for inclusion in the IEBC. Further this action is consistent with the action taken on G33-06/07, Part I.

Assembly Action:

None

Final Hearing Results

G33-06/07, Part I	AS
G33-06/07, Part II	AS

Code Change No: G36-06/07

Original Proposal

Section: 202

Proponent: Juli Case, Industrial Fabrics Association International

Revise definition as follows:

**SECTION 202
DEFINITIONS**

TENT. Any structure, enclosure or shelter ~~which is~~ constructed of ~~canvas~~ fabric or pliable material supported in any manner except by air or the contents it protects.

Reason: To revise outdated material. "Canvas" is a fabric term that applies to a woven fabric, traditionally of cotton. This material has not been used in tent construction for decades. The phrase "fabric or pliable material" would apply to tents made of either coated fabric or laminated fabric constructions, were dominate this product niche.

Members of the Industrial Fabrics Association International, including the Lightweight Structures Association; the Professional Awning Manufacturers Association; the Tent Rental Division; and the Banner, Flag & Graphics Association, worked jointly on assessing terminology. Participants reflected backgrounds in engineering, architecture, end product manufacturing and component suppliers.

The change reflected in the proposed definition is already being used in the membrane structure industry, having been published in the *Fabric Architecture* and *Industrial Fabric Products Review* magazines and IFAI Procedural Handbook for the Safe Installation and Maintenance of Tentage

Bibliography: "By Any Other Name," *Industrial Fabric Products Review*, volume 91, Number 1, January 2006.

"Standardized Industry Definitions" *Fabric Architecture*, Volume 18, No. 2, March/April 2006

"A Defining Moment for Fabric Structures," *InTents*, volume 12, number 1, February/March 2005

"Defining the Basics," *InTents*, Volume 13, Number 1, February/March 2006

IFAI Procedural Handbook for the Safe Installation and Maintenance of Tentage, IFAI,

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: Revising the language to reflect a more general term fabric versus canvas provides a more encompassing definition.

Assembly Action:

None

Final Hearing Results

G36-06/07

AS

Code Change No: **G46-06/07**

Original Proposal

Sections: 308.5.1 (IFC [B] 202)

Proponent: Wayne R. Jewell, City of Southfield, MI

Revise as follows:

308.5.1 Adult care facility. A facility that provides accommodations for less than 24 hours for more than five unrelated adults and provides supervision and personal care services shall be classified as Group I-4.

Exception: A facility where occupants are capable of responding to an emergency situation without physical assistance from the staff shall be classified as Group ~~A-3~~ R-3.

Reason: When I had proposed change G-32-00 I had a serious typo an "A" was placed where an "R" should have been. I never intended for these facilities to be considered an Assembly Group and this is a correction of my error. The language in Section 310.1 for R-3 uses does speak to these uses.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: This proposal corrects an incorrect occupancy classification. The current Group R-3 occupancy classifications in Section 310 correlates with this proposal.

Analysis: See committee action on G38-06/07.

Assembly Action:

None

Final Hearing Results

G46-06/07

AS

Code Change No: **G47-06/07**

Original Proposal

Sections: 310.1 (IFC [B] 202)

Proponent: Richard Lyman, Sandy City Fire Department, representing the Utah Chapter

Revise as follows:

310.1 Residential Group R. Residential Group R includes, among others, the use of a building or structure, or a portion thereof, for sleeping purposes when not classified as an Institutional Group I or when not regulated by the *International Residential Residential Code* in accordance with Section 101.2. Residential occupancies shall include the following:

R-1 Residential occupancies containing sleeping units where the occupants are primarily transient in nature, including:

- Boarding houses (transient)
- Hotels (transient)
- Motels (transient)

Congregate living facilities (transient) with 10 or fewer occupants are permitted to comply with the construction requirements for Group R-3.

R-2 Residential occupancies containing sleeping units or more than two dwelling units where the occupants are primarily permanent in nature, including:

- Apartment houses
- Boarding houses (not transient)
- Convents
- Dormitories
- Fraternities and sororities
- Hotels (nontransient)
- Monasteries
- Motels (nontransient)
- Vacation timeshare properties

Congregate living facilities with 16 or fewer occupants are permitted to comply with the construction requirements for Group R-3.

R-3 Residential occupancies where the occupants are primarily permanent in nature and not classified as Group R-1, R-2, R-4 or I, including:

- Buildings that do not contain more than two dwelling units.
- Adult facilities that provide accommodations for five or fewer persons of any age for less than 24 hours.
- Child care facilities that provide accommodations for five or fewer persons of any age for less than 24 hours.
- Congregate living facilities with 16 or fewer persons.
- Adult care and child care facilities that are within a single-family home are permitted to comply with the *International Residential Code*

R-4 Residential occupancies shall include buildings arranged for occupancy as residential care/assisted living facilities including more than five but not more than 16 occupants, excluding staff.

Group R-4 occupancies shall meet the requirements for construction as defined for Group R-3, except as otherwise provided for in this code, or shall comply with the *International Residential Code*.

Reason: This change would establish a threshold of 10 for occupancies such as a bed and breakfast or a ski rental which would otherwise be considered an R-1. If a single family dwelling was converted into a bed and breakfast with two bedrooms accommodating just 4 guests the requirements for an R-1 are triggered. One of the Legacy Codes established a threshold of 10 for congregate residences. This concept was brought back into the IBC in the 2006 Code for an R-2 but not an R-1. Because of the transient nature of these types of occupancies and the lack of familiarity with surroundings a maximum of 10 rather than 16 is proposed.

Utah has a statewide amendment to the 2003 IBC that currently addresses R-1 and R-2 occupancies with a similar exception. This statewide amendment would be eliminated with the approval of the proposed change.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: This proposal addresses the need to provide a classification of congregate living facilities that are considered transient in nature under Group R-1. The 2006 IBC contains a classification for more permanent facilities under Group R-2. The classification under Group R-1 is more restrictive and allows a Group R-3 classification only if the number of occupants is 10 or less versus 16 or less under Group R-2.

Assembly Action:

None

Final Hearing Results

G47-06/07

AS

Code Change No: **G52-06/07**

Original Proposal

Section: 402.6.1 (New)

Proponent: Daniel E. Nichols, New York State Department of State

Add new text as follows:

402.6.1 Reduced open space. The permanent open space of 60 feet (18 288 mm) shall be permitted to be reduced to not less than 40 feet (12 192 mm), provided the following requirements are met:

1. The reduced open space shall not be allowed for more than 75 percent of the perimeter of the covered mall building and anchor buildings.
2. The exterior wall facing the reduced open space shall have a minimum fire-resistance rating of 3 hours.
3. Openings in the exterior wall facing the reduced open space shall have opening protectives with a minimum fire protection rating of 3 hours
4. Group E, H, I, or R occupancies are not within the covered mall building or anchor stores.

Reason: The purpose of the code change is to allow covered mall buildings and anchor buildings to reduce the required open space around the building as already permitted in buildings with similar fire hazards.

Unlimited area buildings, where permitted in Section 507, all require an open space around the building of 60 feet to prevent exposure fire spread. Section 507.5 permits sprinklered one- and two-story B, M, F, and S buildings, one-story A-4 buildings, and Type II buildings serving as a group A-3 or as a movie theater to reduce the open space requirement to 40 feet. This reduction is permitted in these locations when the exterior wall in the reduced space area is rated for 3 hours and doesn't include more than 75 percent of the building perimeter.

Looking at the definition of a covered mall building, a vast majority of the uses described therein are found within a covered mall building. Therefore, it can be assumed that the fire load within a mall is similar than the fire load permitted in a code compliant unlimited area building. Since the intent of the open space requirement is to prevent fire spread from one building to another and the fire loads are similar, allowing covered mall buildings to be subject to the same separation requirements as other unlimited area buildings does not reduce the level of fire protection afforded.

Exception #4 is not found in Section 507.5 and has been added to keep this code change proposal aligned with the occupancies permitted to use Section 507.5. Group E, H, I, and R occupancies are not prohibited from being within a covered mall building or an anchor store. This exception would prohibit the use of the reduced open space if one of the occupancies was part of the covered mall building or anchor store design.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: Creates a consistency with the allowance of reduced open space for unlimited buildings in Section 507. Covered mall buildings are simply an unique 3 story unlimited building.

Assembly Action:

None

Final Hearing Results

G52-06/07

AS

Code Change No: G53-06/07

Original Proposal

Section: 402.8 (New)

Proponent: Daniel E. Nichols, New York State Department of State

Add new text as follows:

402.8 Interior Finish. Interior wall and ceiling finishes within the mall, exits, and exit passageways shall have a minimum flame spread rating of Class B per Section 803. Interior floor finishes shall meet the requirements of Section 804.

(Renumber subsequent sections)

Reason: The purpose of this code change proposal is to clearly state the interior finish requirements within a covered mall building.

Currently, Sections 402 and 803 do not specifically state the requirements for interior finish within a covered mall building. Since a covered mall building is actually a mixed-use building, the most restrictive occupancy requirements should apply. However, some projects that we have dealt with have stated the mall portion of the covered mall building conforms with Group M requirements since a covered mall building is a Group M with all other uses being accessory.

The use of a mall space has gone beyond its original intent of providing a wide-open walking space to communicate people amongst the various shops and stores within. Mall spaces have become locations to assemble to watch a dance recital, attend a fashion show, or for the local radio station to run a promotion in. It has become clear that mall spaces are assembly spaces themselves, not taking into account the tenant assembly spaces (restaurants, movie theaters, paintball arenas, etc.) that open into them. Therefore, it seems logical to protect the mall space similar to Group A requirements.

The code change proposal adds the performance requirements of interior wall and ceiling finishes into Section 402 and references the code user to Section 803 for specifics. This method of stating performance requirements and referencing to Section 803 is currently found in Section 404 for atriums. Coincidentally, Section 404.7 also requires atrium spaces to have Class B fire spread rating for wall and ceiling finishes. Based on the type of activity occurring in both covered mall buildings and atrium spaces, it is appropriate that these to special use areas correlate with the interior wall and ceiling finish requirements of sprinklered Group A occupancies.

The 1997 Southern Building Code (Section 413.7.1) stated that a covered mall building has a Group M occupancy classification and all other occupancy types, including Group A, were accessory to the Group M. The current definition of a covered mall building has its source from the 1996 BNBC which talks of the components of a covered mall building but doesn't set Group A occupancies accessory to the retail uses. With the recognition of a mall being both a retail and entertainment venue (as specified in the definition), including specific requirements for interior wall and ceiling finishes that mirror the requirements for sprinkler Group A uses is appropriate.

Bibliography: 1997 Southern Building Code, 1996 BOCA *National Building Code*

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Modified

Modify proposal as follows:

402.8 Interior Finish. Interior wall and ceiling finishes within the mall and, exits, and exit passageways shall have a minimum flame spread rating index of Class B per Section 803. Interior floor finishes shall meet the requirements of Section 804.

Committee Reason: Based upon the proponents reason. The modification recognized that exits include exit passageways and that flame spread index® is more appropriate terminology used throughout the I-Codes than flame spread rating.®

Assembly Action:

None

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Marcelo M. Hirschler, GBH International, representing the American Fire Safety Council, requests Approval as Modified by this public comment.

Further modify proposal as follows:

402.8 Interior Finish. Interior wall and ceiling finishes within the mall and exits shall have a minimum flame spread index and smoke developed index of Class B per Chapter 8 Section 803. Interior floor finishes shall meet the requirements of Section 804.

Commenter's Reason: The original proposal correctly pointed out that there is a need to state clearly the interior finish requirements within a covered mall building. Chapter 8 requires that those interior wall and ceiling finishes that are not considered trim (per Section 806) must meet both a flame spread index (in the case of Class B it would be a flame spread index of between 26 and 75) and a smoke developed index (of no more than 450). With the proposed reorganization of Chapter 8 and the option of using NFPA 286 instead of ASTM E 84 for testing interior finishes, the reference to Chapter 8 is better than the reference to section 803.

Final Hearing Results

G53-06/07

AMPC1

Code Change No: G54-06/07

Original Proposal

Section: 402.9

Proponent: Sarah A. Rice, Schirmer Engineering Corporation

Revise as follows:

402.9 Smoke control. Where a covered mall building contains an atrium, a smoke control system shall be provided where required for atriums in accordance with Section 404 404.4.

Exception: A smoke control system is not required in covered mall buildings, when an atrium connects only two stories.

Reason: The issue is - when does a covered mall building require a smoke control system. As currently written the code has been interpreted as always mandating a smoke control system for any covered mall building regardless of configuration. The reference in Section 402.9 for the code user goes to go to the Atrium Section (404) seems to be easily missed.

While some may see the proposed language as redundant we feel it clarifies the intent and application of the smoke control provisions as they apply to covered mall buildings. The proposed language does 2 things:

1. Makes it clear that only when a covered mall building has an atrium a smoke control system might be needed. This language will make it clear that a single story covered mall building will never be required to have a smoke control system, as it won't have an atrium, and
2. For those multi-story covered mall buildings, the inclusion of the exception in Section 402.9 (which is mirrored after the exception in 404.4) allows the code user to know that the smoke control requirements are only for covered mall buildings having 3 stories. This seeks to eliminate the confusion that seems to exist when the user is sent to Section 404.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: Clarifies that smoke control is only required for a covered mall building when it contains an atrium that connects more than 2 stories.

Assembly Action:

None

Final Hearing Results

G54-06/07

AS

Code Change No: **G56-06/07**

Original Proposal

Section 402.11.1, Chapter 35

Proponent: Marcelo M. Hirschler, GBH International, representing the American Fire Safety Council

THIS PROPOSAL IS ON THE AGENDA OF THE IBC FIRE SAFETY CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THAT COMMITTEE.

1. Revise as follows:

402.11.1 Materials. Children's playground structures shall be constructed of noncombustible materials or of combustible materials that comply with the following:

1. Fire-retardant-treated wood.
2. Light-transmitting plastics complying with Section 2606.
3. Foam plastics (including the pipe foam used in soft-contained play equipment structures) having a maximum heat-release rate not greater than 100 kW when tested in accordance with UL 1975.
4. Aluminum composite material (ACM) meeting the requirements of Class A interior finish in accordance with Chapter 8 when tested as an assembly in the maximum thickness intended for use.
5. Textiles and films complying with the flame propagation performance criteria contained in NFPA 701.
6. Plastic materials used to construct rigid components of soft-contained play equipment structures (such as tubes, windows, panels, junction boxes, pipes, slides and decks) meeting the UL 94 V-2 classification when tested in accordance with UL 94 or exhibiting a peak rate of heat release not exceeding 400 kW/m² when tested in accordance with ASTM E 1354 at an incident heat flux of 50 kW/m² in the horizontal orientation at a thickness of 6 mm.
7. Ball pool balls, used in soft-contained play equipment structures, having a maximum heat release rate not greater than 100 kW when tested in accordance with UL 1975. The minimum specimen test size shall be 36 inches by 36 inches (914 mm by 914 mm) by an average of 21 inches (533 mm) deep, and the balls shall be held in a box constructed of galvanized steel poultry netting wire mesh.
8. Foam plastics shall be covered by a fabric, coating or film meeting the flame propagation performance criteria of NFPA 701.
9. The floor covering placed under the children's playground structure shall exhibit a Class I interior floor finish classification, as described in Section 804, when tested in accordance with NFPA 253.

2. Add standard to Chapter 35 as follows:

ASTM E1354-04a Standard Test Method for Heat and Visible Smoke Release Rates for Materials and Products Using an Oxygen Consumption Calorimeter

Reason: The ASTM E 1534 test (cone calorimeter) is known to be a good predictor of full scale fire performance. Recent tests were conducted in which polyethylene materials (typically used for these components) complying with UL 94 V2 and UL 94 V0 classifications were tested using test method ASTM E 1354 in the vertical orientation at 6 mm thickness and the results (in duplicate) showed peak rates of heat release as follows:

Polyethylene UL 94 V2: 356.8 and 357.6 kW/m²
Polyethylene UL 94 V0: 328.8 and 318.1 kW/m²

Earlier data had already shown that non fire retarded pure polyethylene can give peak rates of heat release that exceed 1,000 kW/m², something found in several publications, including the following two: (a) Hirschler, M. M., "Heat release from plastic materials," Chapter 12a, in Babrauskas, V. and Grayson, S. J. (Eds.), Heat Release in Fires, (1992), pp. 375-422, Elsevier, London, UK and (b) Hirschler, M.M., "Flammability and Fire Performance", Chapter 13 in "PVC Handbook", Ed. C.E. Wilkes, J.W. Summers & C.A. Daniels, Carl Hanser, Cincinnati, OH, 2005, pp. 419-481.

The standard referenced has already been approved for use in the IFC (Chapter 8).

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:**Approved as Modified****Modify the proposal as follows:**

402.11.1 Materials. Children-s playground structures shall be constructed of noncombustible materials or of combustible materials that comply with the following:

1. Fire-retardant-treated wood.
2. Light-transmitting plastics complying with Section 2606.
3. Foam plastics (including the pipe foam used in soft-contained play equipment structures) having a maximum heat-release rate not greater than 100 kW when tested in accordance with UL 1975.
4. Aluminum composite material (ACM) meeting the requirements of Class A interior finish in accordance with Chapter 8 when tested as an assembly in the maximum thickness intended for use.
5. Textiles and films complying with the flame propagation performance criteria contained in NFPA 701.
6. Plastic materials used to construct rigid components of soft-contained play equipment structures (such as tubes, windows, panels, junction boxes, pipes, slides and decks) ~~meeting the UL 94 V-2 classification when tested in accordance with UL 94~~ or exhibiting a peak rate of heat release not exceeding 400 kW/m² when tested in accordance with ASTM E 1354 at an incident heat flux of 50 kW/m² in the horizontal orientation at a thickness of 6 mm.
7. Ball pool balls, used in soft-contained play equipment structures, having a maximum heat release rate not greater than 100 kW when tested in accordance with UL 1975. The minimum specimen test size shall be 36 inches by 36 inches (914 mm by 914 mm) by an average of 21 inches (533 mm) deep, and the balls shall be held in a box constructed of galvanized steel poultry netting wire mesh.
8. Foam plastics shall be covered by a fabric, coating or film meeting the flame propagation performance criteria of NFPA 701.
9. The floor covering placed under the children-s playground structure shall exhibit a Class I interior floor finish classification, as described in Section 804, when tested in accordance with NFPA 253.

(Portions of proposal not shown remain unchanged)

Committee Reason: This action was taken to accept the ASTM E 1354 since it does provide a good indication of the actual performance of the material. The option of using the UL 94 test was deleted since this is a small scale test which was not intended for evaluating the flammability of such plastic play structures.

Assembly Action:**None**

Final Hearing Results

G56-06/07

AM

Code Change No: G60-06/07

Original Proposal

Section: 403.3.1

Proponent: Thomas Kinsman, T.A. Kinsman Consulting Company, Bellevue, WA

Revise as follows:

403.3.1 Type of construction. The following reductions in the ~~minimum construction type allowed~~ minimum fire resistive values of the building elements in Table 601 shall be ~~allowed as provided in Section 403.3~~ permitted as follows:

1. For buildings not greater than 420 feet (128 m) in height, the fire resistive values of the building elements in Type IA construction shall be allowed permitted to be reduced to the minimum fire resistive values for the building elements in Type IB.

Exception: The required fire-resistance rating of columns supporting floors shall not be ~~allowed permitted to be reduced~~ to the fire resistive value for columns in Type IB.

2. In other than Groups F-1, M and S-1, the fire resistive values of the building elements in Type IB construction shall be ~~allowed~~ permitted to be reduced to the fire resistive elements for columns in Type IIA.
3. The height and area limitations of ~~the a building containing building elements with reduced construction type~~ fire resistive values shall be ~~allowed~~ permitted to be the same as for ~~the original construction type~~ the building without such reductions.

Reason: The purpose of this code change is to clarify the language and make it consistent with the charging 403.3 section title and paragraph which addresses fire resistive reductions rather than construction type reductions. It is not intended to make any substantive changes to the current code.

The construction types haven't changed as indicated by the fact that these buildings, even with the fire resistive reductions in the building elements, are still permitted to use the unreduced construction type with respect to Table 503. In addition, there is now the anomaly of buildings < 420 feet high with all elements reduced to IB, except for the columns – so in such cases, the reduced building really isn't a IB either.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Modified

Modify the proposal as follows:

403.3.1 Type of construction. The following reductions in the minimum fire ~~resistive values~~ resistance rating of the building elements in Table 601 shall be permitted as follows:

1. For buildings not greater than 420 feet (128 m) in height, the fire ~~resistive values~~ resistance rating of the building elements in Type IA construction shall be permitted to be reduced to the minimum fire ~~resistive values~~ resistance ratings for the building elements in Type IB.

Exception: The required fire-resistance rating of columns supporting floors shall not be permitted to be reduced, ~~to the fire resistive values for columns in Type IB.~~

2. In other than Groups F-1, M and S-1, the fire ~~resistive values~~ resistance rating of the building elements in Type IB construction shall be permitted to be reduced to the fire ~~resistive elements for columns~~ resistance ratings in Type IIA.
3. The height and area limitations of a building containing building elements with reduced fire ~~resistive values~~ resistance ratings shall be permitted to be the same as the building without such reductions.

Committee Reason: Based upon the proponents reason. The modification uses AFire Resistance rating® which is more appropriate terminology than Afire resistive values.® The modification also takes out specific reference to columns with regard to fire resistance ratings since it is superfluous language.

Assembly Action:

None

Final Hearing Results

G60-06/07

AM

Code Change No: G63-06/07

Original Proposal

Sections: 403.10 (New), 3007 (New), Chapter 35 (New)

Proponents: Dave Frable, U.S. General Services Administration; Gerry Jones/Herman Brice, Co-Chairs, NIBS/MMC Committee for Translating the NIST World Trade Center Investigation Recommendations into Building Codes

1. Add new text as follows:

403.10 Fire service access elevator. In buildings with an occupied floor more than 120 feet above the lowest level of fire department vehicle access, a minimum of one fire service access elevator shall be provided in accordance with Section 3007.

(Renumber subsequent sections)

SECTION 3007
FIRE SERVICE ACCESS ELEVATOR

3007.1 General. Where required by Section 403.10, every floor of the building shall be served by a fire service access elevator. Except as modified in this section, the fire service access elevator shall be installed in accordance with this chapter and ASME A17.1.

3007.2 Hoistway enclosures protection. The fire service access elevator shall be located in a shaft enclosure complying with Section 707.

3007.3 Fire service access elevator lobby. The fire service access elevator shall have a door opening into a fire service access elevator lobby complying with Sections 3007.3.1 through 3007.3.3.

Exception: Where fire service access elevators have multiple door openings on a floor, additional door openings shall be permitted to open to lobbies protected in accordance with Section 707.14.1.

3007.3.1 Access. The fire service access elevator lobby shall have direct access to a building stair.

3007.3.2 Lobby enclosure. The fire service access elevator lobby enclosure shall have a minimum 1-hour fire resistance rating.

3007.3.3 Lobby fire door assemblies. Each fire service access elevator lobby fire door shall have a fire protection rating of not less than 1 hour and shall be self closing or automatic closing.

3007.4 Standpipe hose connection. Each building exit stair having direct access to the fire service access elevator lobby shall be provided with a standpipe hose connection in accordance with Section 905.

3007.5 Two-way fire department communication system. The fire service access elevator and every associated fire service access elevator lobby shall be provided with an approved two-way fire department communication system. It shall operate between a fire command center complying with Section 911 and the fire service access elevator and every associated fire service access elevator lobby. The two-way fire department communication system shall be designed and installed in accordance with NFPA 72.

Exception: Fire department radio systems where approved by the fire department.

3007.6 Elevator car size. The elevator car size shall be in accordance with Section 3002.4.

3007.7 Elevator system monitoring. Conditions necessary for the continued safe operation of the fire service access elevator shall be continuously monitored at the fire command center by a *Standard Fire Service Interface* system meeting the requirements of NFPA 72 and NEMA SB30.

3007.8 Electrical power. The following features associated with fire service access elevators shall be supplied by both normal power and Type 60/Class 2/Level 1 standby power:

1. Elevator equipment
2. Elevator machine room ventilation and cooling equipment
3. Elevator controller cooling equipment

3007.8.1 Control wiring The normal and standby power control wiring supplying the fire service access elevators shall be protected by construction having a minimum 1 hour fire resistive rating.

3007.9 Standby power. The fire service access elevator shall be provided with standby power in accordance with Sections 2702 and 3003.

3007.10 Elevator machine rooms and machinery spaces. Automatic fire sprinklers shall not be installed in fire service access elevator machine rooms and machinery spaces.

2. Add new standards organization and standard to Chapter 35 as follows:

National Electrical Manufacturer's Association (NEMA)
1300 N. 17th Street
Suite 1847
Rosslyn, VA 22209

SB30-05 Fire Service Annunciator and Interface

Reason: Following the events of September 11, 2001, the U.S. General Services Administration (GSA) undertook a research initiative for the development of performance requirements for the use of elevators for occupant egress and fire service access in buildings. This research initiative is currently being conducted by the National Institute of Standards and Technology (NIST). The proposed code change is a by-product of the research currently being conducted by NIST as well preliminary information provided by a task group of ASME A17.1 for determining the required system features necessary for safe operation by trained firefighters during a fire emergency.

We feel that the requirements included in this proposal provide a reasonable degree of safety for firefighters operating the fire service access elevator to a location for staging firefighters and equipment one or two floors below the fire. The staging location will have access to a stair and standpipe that will allow for firefighting operations to be conducted from just above the staging area.

Cost Impact: The code change proposal will increase the cost of construction.

Analysis: Results of review of the proposed standard will be posted on the ICC Website by August 20, 2006.

Note: The following analysis was not in the Code Change Proposal book but was published in the "Errata to the 2006/2007 Proposed Changes to the International Codes and Analysis of Proposed Referenced Standards" provided at the code development hearings:

Analysis: Review of the proposed new standard indicated that, in the opinion of ICC Staff, the standard did not comply with ICC standards criteria, Section 3.6.2.1 for mandatory language.

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: Generally the committee was in favor of the proposal but disapproved the code change based upon a variety of issues that needed to be addressed. For instance there was concern with terminology in proposed section 3007.3.1 which currently references a "building stair" instead of an "exit enclosure." Other concerns related to the standard reference to NEMA SB30 and the size of the elevator lobby.

Assembly Action:

Approved as Submitted

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because an assembly action was successful and public comments were submitted.

Public Comment 1:

Dave Frable, U.S. General Services Administration requests Approval as Modified by this public comment.

1. Modify proposal as follows:

403.10 Fire service access elevator. In buildings with an occupied floor more than 120 feet above the lowest level of fire department vehicle access, a minimum of one fire service access elevator shall be provided in accordance with Section 3007.

(Renumber subsequent sections)

**SECTION 3007
FIRE SERVICE ACCESS ELEVATOR**

3007.1 General. Where required by Section 403.10, every floor of the building shall be served by a fire service access elevator. Except as modified in this section, the fire service access elevator shall be installed in accordance with this chapter and ASME A17.1.

3007.2 Hoistway enclosures protection. The fire service access elevator shall be located in a shaft enclosure complying with Section 707.

3007.3 Fire service access elevator lobby. The fire service access elevator shall ~~have a door opening open~~ open into a fire service access elevator lobby ~~complying in accordance with~~ Sections 3007.3.1 through 3007.3.3.

Exception: Where ~~a~~ fire service access elevators ~~have multiple~~ has two entrances ~~door openings~~ open onto a floor, ~~the second additional entrance~~ door openings shall be permitted to open into an elevator lobby ~~lobbies protected~~ in accordance with Section 707.14.1.

3007.3.1 Access. The fire service access elevator lobby shall have direct access to an exit enclosure ~~building stair~~.

3007.3.2 Lobby enclosure. The fire service access elevator lobby ~~enclosure~~ shall be enclosed with a smoke barrier ~~having~~ have a minimum 1-hour fire resistance rating, except that lobby doorways shall comply with Section 3007.3.3.

Exception: Enclosed fire service access elevator lobbies are not required at the street floor.

~~**3007.3.3 Lobby fire door assemblies doorways.** Each fire service access elevator lobby fire door shall have a fire protection rating of not less than 1 hour and shall be self closing or automatic closing be provided with a doorway that is protected with a ¾ hour fire door assembly complying with Section 715.4.~~

~~**3007.4 Standpipe hose connection.** Each building exit stair having direct access to the fire service access elevator lobby shall be provided with a A Class I standpipe hose connection in accordance with Section 905 shall be provided in the exit enclosure having direct access from the fire service access elevator lobby.~~

~~**3007.5 Two-way fire department communication system.** The fire service access elevator and every associated fire service access elevator lobby shall be provided with an approved two-way fire department communication system. It shall operate between a fire command center complying with Section 911 and the fire service access elevator and every associated fire service access elevator lobby. The two-way fire department communication system shall be designed and installed in accordance with NFPA 72.~~

~~**Exception:** Fire department radio systems where approved by the fire department.~~

~~**3007.6 Elevator car size.** The elevator car size shall be in accordance with Section 3002.4.~~

~~**3007.7 Elevator system monitoring.** The Conditions necessary for the continued safe operation of the fire service access elevator shall be continuously monitored at the fire command center by a *Standard Fire Emergency Service Interface* system meeting the requirements of NFPA 72 and NEMA SB30.~~

~~**3007.8 Electrical power.** The following features associated with serving each fire service access elevators shall be supplied by both normal power and Type 60/Class 2/Level 1 standby power:~~

1. Elevator equipment
2. Elevator machine room ventilation and cooling equipment
3. Elevator controller cooling equipment

~~**3007.8.1 Protection of wiring or cables.** Control wiring. The normal and standby power control wiring supplying the fire service access elevators shall be protected by construction having a minimum 1 hour fire resistive rating. Wires or cables that provide normal and standby power, control signals, communication with the car, lighting, heating, air conditioning, ventilation, and fire detecting systems to fire service access elevators shall be protected by construction having a minimum 1 hour fire resistance rating or shall be circuit integrity cable having a minimum 1 hour fire resistance rating.~~

~~**3007.9 Standby power.** The fire service access elevator shall be provided with standby power in accordance with Sections 2702 and 3003.~~

~~**3007.10 Elevator machine rooms and machinery spaces.** Automatic fire sprinklers shall not be installed in fire service access elevator machine rooms and machinery spaces.~~

2. Revise as follows:

~~**903.3.1.1 NFPA 13 sprinkler systems.** Where the provisions of this code require that a building or portion thereof be equipped throughout with an automatic sprinkler system in accordance with this section, sprinklers shall be installed throughout in accordance with NFPA 13 except as provided in Section 903.3.1.1.1.~~

~~**903.3.1.1.1 Exempt locations.** Automatic sprinklers shall not be required in the following rooms or areas where such rooms or areas are protected with an approved automatic fire detection system in accordance with Section 907.2 that will respond to visible or invisible particles of combustion. Sprinklers shall not be omitted from any room merely because it is damp, of fire-resistance rated construction or contains electrical equipment.~~

1. Any room where the application of water, or flame and water, constitutes a serious life or fire hazard.
2. Any room or space where sprinklers are considered undesirable because of the nature of the contents, when approved by the fire code official.
3. Generator and transformer rooms separated from the remainder of the building by walls and floor/ceiling or roof/ceiling assemblies having a fire-resistance rating of not less than 2 hours.
4. In rooms or areas that are of noncombustible construction with wholly noncombustible contents.
5. In fire service access elevator machine rooms and machinery spaces.

~~**Commenter's Reason:** As the proponent of the original code change proposal, I submit this comment to support the successful Assembly Action in Lake Buena Vista that recommended approval of this code change. The proposed code change is a by-product of research currently being conducted by the National Institute of Standards and Technology (NIST) and funded by the U.S. General Services Administration. Overall, the General Code Committee stated they were in favor of the code change proposal but disapproved the code change proposal based on a number of issues. The purpose of this modified code change is to address the issues raised by the General Code Committee.~~

1. **3007.3 Fire service access elevator lobby.** This paragraph was revised for clarification purposes only. The exception also clarifies that if the fire service access elevator has two entrances, the second entrance is permitted to open into an enclosed or otherwise protected elevator lobby in accordance with 707.14.1.
2. **3007.3.1 Access.** This paragraph was revised for clarification purposes only. This change addresses the concerns of the Code Committee regarding the term "building stair".
3. **3007.3.2 Lobby enclosure.** This paragraph was revised for clarification purposes only. This change addresses concerns that this paragraph was non-specific with regard to the enclosure requirements for the lobby. A smoke barrier is the appropriate reference since it is designed to resist fire and smoke spread and is intended to create an area of refuge. The new exception addresses the need for not requiring an enclosed lobby on the street floor.

4. **3007.3.3 Lobby doorways.** The title and content of this paragraph was revised for clarification purposes only. A horizontal separation is allowed to be protected with a ¾ hour fire door assembly. Clearly a ¾ hour fire rated door provides more protection than a 20 minute fire door typically required by a smoke barrier.
5. **3007.4 Standpipe hose connection.** This paragraph was revised for clarification purposes only. It was felt that since 905.4 is limited to "required" exit stairways; this paragraph will still require a standpipe hose connection in non-required or additional exit stairways.
6. **3007.5 Two-way fire department communication system.** This paragraph was deleted since it is redundant and currently covered in the IBC.
7. **3007.6 Elevator car size.** This paragraph was deleted since it is redundant and currently covered in the IBC.
8. **3007.7 Elevator system monitoring.** This paragraph was revised to delete superfluous text, correct the title of the interface system, and to delete the reference to NEMA SB30.
9. **3007.8 Electrical power.** This paragraph was revised for clarification purposes only.
10. **3007.8.1 Protection of wiring or cables.** The title and content of this paragraph was revised for clarification purposes only.
11. **3007.9 Standby power.** This paragraph was deleted since it is redundant and currently covered in the IBC.
12. **3007.10 Elevator machine rooms and machinery spaces.** This paragraph was relocated to Chapter 9 based on a recommendation from the General Code Committee. See new exemption number 5, 903.3.1.1.1.

903.3.1.1.1 Exempt locations (new exemption 5). Added new exemption number 5. Relocated material from 3007.10. Provides an exemption for providing automatic sprinklers in fire service access elevator machine rooms and machinery spaces. The need for providing sprinkler protection in these areas is questionable based on the lack of fire loss statistics for elevator machine room and machinery space fires and the concerns from ASME regarding disconnecting the main power line to the affected elevators prior to the application of water from the sprinklers.

Final Hearing Results

G63-06/07 AMPC1

Code Change No: G68-06/07

Original Proposal

Section: 403.15 (New), Table 403.15 (New)

Proponent: William M. Connolly, State of New Jersey, Dept. of Community Affairs, Division of Codes and Standards, representing the International Code Council Ad Hoc Committee on Terrorism Resistant Buildings

Add new text as follows:

403.15 Spray-Applied Fire Resistive Materials (SFRM). The bond strength of the SFRM shall be in accordance with Table 403.15.

**TABLE 403.15
MINIMUM BOND STRENGTH**

HEIGHT OF BUILDING	SFRM MINIMUM BOND STRENGTH
More than 75 feet ^a and up to 420 feet	430 psf
More than 420 feet	1,000 psf

a. Above the lowest level of fire department vehicle access

Reason: This code change proposal is one of fourteen proposals being submitted by the International Code Council Ad Hoc Committee on Terrorism Resistant Buildings.

The purpose of this proposal is to increase the required adhesions of Spray Applied Fire Resistant Materials (SFRM).

The National Institute of Standards and Technology's (NIST) investigation into the World Trade Center (WTC) tragedy documented that the proximate cause of the actual collapse was the action of a building contents fire on light steel members in the absence of spray applied fire resistant material, which had been dislodged. Events far less dramatic than an airplane attack have been known to dislodge SFRM. The initiating events can be as simple as elevator movement, building sway or maintenance activities.

Recommendation 6 of the NIST WTC Report calls for improvement of the in-place performance of SFRM. This proposal is one of three that seeks to achieve that objective. The other two are a proposal for a new Section 714.8 dealing with the application of SFRM and a strengthened Section 1704.10 dealing with special inspections of SRFM installations.

The current code specifies a SFRM bond strength of 150 psf when tested in accordance with ASTM E736, no matter how large the building or how high the risk. This proposal requires the use of higher bond strength material for buildings over 75 feet in height and yet again higher strength for those that exceed 420 feet. These higher standards are warranted by the higher risk associated with taller buildings. Products that meet this standard are available in the marketplace.

Bond strength is not the only material characteristic that affects in-place durability. Density does as well. This proposal does not establish a separate density standard because density and bond strength are linked to one another. High bond strength entails high density.

Some might argue that more research is needed to establish appropriate bond strengths for different levels of risk. The proponents agree but believe something needs to be done now to improve the in-place durability of SFRM. This code provision will have that result. It should be recognized as a beginning, not an end.

Bibliography: National Institute of Standards and Technology. Final Report of the National Construction Safety Team on the Collapses of the World Trade Center Towers. United States Government Printing Office: Washington, D.C. September 2005.

Cost Impact: The code change proposal will increase the cost of construction but only marginally so. Many tall buildings already utilize these higher strength materials.

Public Hearing Results

Committee Action:

Approved as Modified

Modify the proposal as follows:

403.15 Spray-Applied Sprayed Fire Resistive Materials (SFRM). The bond strength of the SFRM shall be in accordance with Table 403.15.

**TABLE 403.15
MINIMUM BOND STRENGTH**

HEIGHT OF BUILDING ^a	SFRM MINIMUM BOND STRENGTH
More than 75 feet ^a and up to 420 feet	430 psf
More than 420 feet	1,000 psf

a. Above the lowest level of fire department vehicle access

Committee Reason: Although the data which provides technical support was not provided within the proposal, this does go along with the NIST recommendations and should provide better safety in high-rise buildings. Using the greater bond strengths will increase the probability that the protection will stay in place and will reduce the likelihood of being dislodged. These factors should provide for a longer time of safety. Placing the requirements in the high-rise provisions of Chapter 4 instead of within Chapter 7 makes sense because they are only applicable to high-rises and will be more likely to be found within that section. The committee did agree with the different bond strength requirements based upon the thought the taller buildings are at a higher risk and that items such as the vibration of tall buildings will affect the long term performance. Based on testimony which was provided, the cost impact of this requirement was considered as being relatively small. The higher density products which are currently available will generally meet these requirements. The modifications included a revision of the terminology Aspray applied® to Asprayed® to be consistent with the action of FS156-06/07 and to create a more global point of reference for building height by moving footnote a to the main title of the first column.

Analysis: Note Section 403.3.1 item 1 states A420 feet (128 m) in height,® relating to building height as defined in Section 502.

Assembly Action:

None

Final Hearing Results

G68-06/07

AM

Code Change No: G71-06/07

Original Proposal

Sections: 403.15 (New), 1019.1 (IFC [B] 1019.1)

Proponent: William M. Connolly, State of New Jersey, Dept. of Community Affairs, Division of Codes and Standards, representing the International Code Council Ad Hoc Committee on Terrorism Resistant Buildings

1. Add new text as follows:

403.15 Additional exit stairway. For buildings other than Group R-2 that are more than 420 feet (128 m) in height, one additional exit stairway meeting the requirements of Sections 1009 and 1020 shall be provided in addition to the minimum number of exits required by Section 1019.1. The total width of any combination of remaining stairways with one stairway removed shall not be less than the total width required by Section 1005.1. Scissor stairs shall not be considered the additional exit stair required by this section.

2. Revise as follows:

1019.1 Minimum number of exits. All rooms and spaces within each story shall be provided with and have access to the minimum number of approved independent exits required by Table 1019.1 based on the occupant load of the story, except as modified in Sections 403.15, 1015.1 or 1019.2. For the purposes of this chapter, occupied roofs shall be provided with exits as required for stories. The required number of exits from any story, basement or individual space shall be maintained until arrival at grade or the public way.

Reason: This code change proposal is one of fourteen proposals being submitted by the International Code Council Ad Hoc Committee on Terrorism Resistant Buildings.

This proposed change is intended to enable rapid full evacuation of very tall buildings by ensuring that ongoing and critical firefighting activity does not reduce the total required exit capacity needed to evacuate the remaining occupants of the building. It implements, in part, Recommendation 17 of the National Institute of Standards and Technology (NIST) World Trade Center (WTC) report.

The basic purpose behind the Code's current egress provisions for very tall buildings is to evacuate several floors near the fire floor. The provisions do not contemplate prompt full building evacuation. The NIST WTC report calls for Codes to consider that criterion. It is important to note that the need for full evacuation may be the result of a terrorist event, but that a range of other natural occurrences or man-made failures might also necessitate full building evacuation.

If the need for a full building evacuation occurs because of or at the same time as a fire then there will be very real problems. Necessary firefighting operations will reduce the capacity of the egress system. The extended period of time needed to fully evacuate a very tall building means that people will still be evacuating while full firefighting operations are taking place. Sound high rise fire fighting doctrine provides that the fire department take control of one stair, the one most appropriate to the circumstances of the given fire condition, in order to conduct suppression activities. In a building having two required stairs, each of the same width, this means that one-half of the exit capacity has been lost in a building which is still being evacuated.

This proposal calls for an additional stair so that egress capacity will be maintained through the time that full evacuation is complete. It is important to note that this additional stair is not proposed to be a dedicated fire department stair. The intent of the proposed provision is that the fire department be able to choose the stair which is most appropriate for the actual fire event. The principal purpose of this change is to maintain egress capacity in the case of fire events, but the additional stair will also significantly shorten the time needed for full evacuation in non-fire events.

The proponents recognize that effective use of this feature will require emergency responders to manage evacuation flow to the available stairs. The proponents have submitted proposed changes to Articles 4, 7, and 9 of the IBC that will assist in that management. It should be pointed out, however, that this management problem exists under current code provisions; it is just magnified by the loss of egress capacity for full building evacuation.

The issue of "counter flow" has been much discussed since the WTC tragedy --counter flow meaning the fire fighters going up interfere with occupants moving down. The NIST report suggests that counter flow did not slow evacuation rates, but it did affect firefighter ascent rates. Some have suggested that widening the minimum width of stairs will resolve the counter flow problem.

The proponents disagree and believe that dedicating a stair to the fire service while maintaining necessary egress capacity in the remaining stairs is a better solution. There is a practical limit to how rapidly occupants can descend, no matter how wide the stair. Whether minimum width should be expanded because the practical limit cannot be obtained at the current minimum is a different code issue than the one addressed here. The proponents have not seen data or analysis which suggests that additional minimum width is needed, independent of counter flow considerations.

Really rapid evacuation of all occupants, but especially those with disabilities, depends upon the development of robust and safe evacuation elevators. That is the long term solution. The elevator industry and the ASME A-117.1 Committee are working hard on this important challenge but a lot of work remains to be done. The proponents recognize that evacuation elevators might one day eliminate the need for the extra stair proposed here, but believe that something must be done now to address this very real problem.

The proposal adds a new Section 403.15 which requires one more stair than is otherwise required by Section 1019.1. It requires that the stair meet the minimum width requirements of Section 1009.1. More importantly, it also requires that the additional stair and the two (or more) stairs required by Section 1019.1 be sized, in terms of width, such that any combination of all stairs, less one, will provide for the required total width required by Section 1009.1. This meets the intent of the change that the required egress width be available even with one stair being used for firefighting operations.

It is important to note that the proposal does not require the additional stair to be located in accordance with other applicable requirements such as travel distance and separation. Those provisions of the Code will be met by the other stairs. The proponents believe that those requirements might be very difficult to meet with the additional stair and are not needed given the intent of the change.

Bibliography: National Institute of Standards and Technology. Final Report of the National Construction Safety Team on the Collapses of the World Trade Center Towers. United States Government Printing Office: Washington, D.C. September 2005.

Cost Impact: The code change proposal will increase the cost of construction for very tall buildings.

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The committee felt that review of the NIST report was not yet complete, therefore this proposal was premature. Modeling should be done to show the extent that an additional stair would improve exiting. The logistics of closing off a stairway for fire department staging during an emergency evacuation must be investigated. The calculation method for exit stairway width was confusing, and did not clearly indicate the width required for the extra stairway. The location of the extra stairway in relation to the other exit stairways was not indicated. In a high rise, fire fighters will typically be using the elevator to get near the fire floor and then move to the stairway. A question would be if this stairway should be located near the elevators.

Assembly Action:

None

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

William M. Connolly, State of New Jersey, Dept. of Community Affairs, Division of Codes and Standards, representing the International Code Council Ad Hoc Committee on Terrorism Resistant Buildings, requests Approval as Submitted.

Commenter's Reason: The Code Development Committee disapproved this change for several reasons. The first was that the "NIST report was not yet complete and the proposal was premature". The NIST report is complete and this proposal addresses Recommendation 17 of the report. The committee also felt that modeling should be done to show the impact of the additional stair. Modeling has been performed by NIST. This model demonstrates that the additional stair improves occupant egress and fire fighter access in all cases. The degree to which the access is improved is directly related to the location of the fire in the building. The committee was also confused with the manner in which the minimum width of the stair is calculated. The code change requires that required egress capacity for the building be determined with one stairway removed from the equation. The committee was also concerned with the lack of guidance regarding the location of the stair. The location of the additional stair is irrelevant. The fire service will commandeer the stair that is closest to the fire location; this code change merely assures that sufficient egress capacity is provided when the fire service does so. It also provides unimpeded access to the fire floor for the fire service. It is for these reasons that the TRB Ad-Hoc Committee requests your support for As Submitted.

Final Hearing Results

G71-06/07

AS

Code Change No: **G77-06/07**

Original Proposal

Section: 405.1

Proponent: Thomas Kinsman, T.A. Kinsman Consulting Company

Revise as follows:

405.1 General. The provisions of this section apply to building spaces having a floor level used for human occupancy more than 30 feet (9144 mm) below the lowest level of exit discharge.

Exceptions:

1. One- and two-family dwellings, sprinklered in accordance with Section 903.3.1.3.
2. Parking garages with automatic sprinkler systems in compliance with Section 405.3.
3. Fixed guideway transit systems.
4. Grandstands, bleachers, stadiums, arenas and similar facilities.
5. Where the lowest story is the only story that would qualify the building as an underground building and has an area not exceeding 1,500 square feet (139 m²) and has an occupant load less than 10.
6. Pumping stations and other similar mechanical spaces where human occupancy involves only intermittent labor relating to maintenance and repair.

Reason: The purpose of this proposal is exempt floor levels containing pumping stations and similar mechanical uses from the requirements of Section 405. The intent of the proposal is to apply this exception to only those pumping stations (water supply, sewage handling, etc.) and other similar mechanical spaces that involve human occupancy only relating maintenance and repairs rather than regular daily use.

The code does not define "human occupancy" found in the charging paragraph. It does define the term "occupiable space" in Section 202 which includes spaces that are used for human labor. Because of its similarity to "human occupancy", this can be, and has been, interpreted broadly to include even labor involving repair and maintenance. Such an interpretation seems beyond the intent of Section 405 given the flavor of the existing exceptions. The safety features required by 405 are overly excessive for such spaces with only intermittent occupancy.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: Section 405 is intended to address concerns with occupants regularly located underground remote from the level of exit discharge, versus spaces which are subject to occasional maintenance. See also the proponent's reason.

Assembly Action:

None

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Jerry J. Barbera, Port of Seattle Airport Building Department, representing himself, requests Approval as Modified by this public comment.

Further modify proposal as follows:

405.1 General. The provisions of this section apply to building spaces having a floor level used for human occupancy more than 30 feet (9144 mm) below the lowest level of exit discharge.

Exceptions:

1. One- and two-family dwellings, sprinklered in accordance with Section 903.3.1.3.
2. Parking garages with automatic sprinkler systems in compliance with Section 405.3.
3. Fixed guideway transit systems.
4. Grandstands, bleachers, stadiums, arenas and similar facilities.
5. Where the lowest story is the only story that would qualify the building as an underground building and has an area not exceeding 1,500 square feet (139 m²) and has an occupant load less than 10.
6. Pumping stations and other similar mechanical spaces ~~where human occupancy involves only intermittent labor relating to maintenance and repair.~~ intended only for limited periodic use by service or maintenance personal.

Commenter's Reason: I agree with the provision provided by the proponent. It is my belief, however, that we should try to have consistent language between the different codes so that the chance of misunderstanding is lessened. Over the 40+ years I have been involved with codes and standards administration, I have found that exceptions without some common set of terms tend to confuse the users and make a proper application of them very difficult.

I surveyed the provisions of IBC Sections Table 307.1(1)-Footnote k, 907.12, 1109.13, 1502.1, and 1607.11.2.1 all relating to mechanical spaces similar to the proposal and found that the common terms were "maintenance", "repair", "limited", "periodic", "service" and "maintenance personal." Therefore, I edited this proposal using these term giving it some of the consistency with the rest of the IBC.

Final Hearing Results

G77-06/07

AMPC1

Code Change No: **G78-06/07**

Original Proposal

Section: 406.2.6

Proponent: David S. Collins, FAIA, The Preview Group, Inc., representing the American Institute of Architects

Revise as follows:

406.2.6 Floor surface. Parking surfaces shall be of concrete or similar noncombustible and nonabsorbent materials.

Exception: ~~Asphalt parking surfaces are permitted at ground level.~~

The area of floor used for parking of automobiles or other vehicles shall be sloped to facilitate the movement of liquids to a drain or toward the main vehicle entry doorway.

Exceptions:

1. Asphalt parking surfaces shall be permitted at ground level.
2. Floors of S-2 parking garages shall not be required to have a sloped surface.

Reason: Many larger parking structures are constructed with prefabricated materials that are difficult if not impossible to design to slope all surfaces. The need to maintain slopes to drains isn't an absolute in such garages.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: This proposal solves a problem faced by many jurisdictions with large parking structures. The slope requirement is not necessary in these structures.

Assembly Action:

None

Final Hearing Results

G78-06/07

AS

Code Change No: G80-06/07

Original Proposal

Section: 406.1.5 (New), Chapter 35

Proponent: Bob Eugene, Underwriters Laboratories, Inc.

1. Add new text as follows:

406.1.5 Automatic garage door openers. Automatic garage door openers, if provided, shall be listed in accordance with UL 325.

2. Add standard to Chapter 35 as follows:

UL

325-02 Door, Drapery, Louver and Window Operations and Systems, with revisions through January 2006

Reason: The purpose of this change is to add a new requirement in the IBC, consistent with an existing requirement in Section R309.6 of the IRC.

The reason for this proposal is to assure consistency in the safety requirements for garage door openers, where provided, regardless if whether the IRC or the IBC is the code applied. This proposal does not require automatic garage door openers to be installed, but when a choice is made to install the openers, that the openers comply with ANSI approved safety requirements.

UL 325-02, Door, Drapery, Louver and Window Operations and Systems, with revisions through January 17, 2006 is an ANSI approved standard under continuous maintenance.

Bibliography: IRC R309.6

Cost Impact: The code change proposal will not increase cost of construction.

Public Hearing Results

Errata: Revise standard reference as follows:

325-02 Door, Drapery, Louver and Window Operations and Systems, with revisions through ~~January~~ February 2006

Note: The following analysis was not in the Code Change Proposal book but was published in the AErrata to the 2006/2007 Proposed Changes to the International Codes and Analysis of Proposed Referenced Standards® provided at the code development hearings:

Analysis: Review of the proposed new standard indicated that, in the opinion of ICC Staff, the standard did comply with ICC standards criteria. This standard is already referenced by the IRC.

Committee Action:

Approved as Submitted

Committee Reason: Reference to UL 325 for automatic garage door openers is appropriate and is consistent with the reference in the IRC.

Assembly Action:

None

Final Hearing Results

G80-06/07

AS

Code Change No: G81-06/07

Original Proposal

Sections: 406.3.6, 412.3.1, 412.3.6, [F] 415.6.1.6, Ch. 5, [F] 905.3.1 (IFC 905.3.1), 1406.2.2, 1509.5.1, 1808.2.5, 1915.5

Proponent: Philip Brazil, PE, Reid Middleton, Inc., representing himself

1. Revise as follows:

406.3.6 Area and height increases. The allowable area and height of open parking garages shall be increased in accordance with the provisions of this section. Garages with sides open on three-fourths of the building's perimeter are permitted to be increased by 25 percent in area and one tier in height. Garages with sides open around the entire building's perimeter are permitted to be increased by 50 percent in area and one tier in height. For a side to be considered open under the above provisions, the total area of openings along the side shall not be less than 50 percent of the interior area of the side at each tier and such openings shall be equally distributed along the length of the tier.

Allowable tier areas in Table 406.3.5 shall be increased for open parking garages constructed to heights less than the table maximum. The gross tier area of the garage shall not exceed that permitted for the higher structure. At least three sides of each such larger tier shall have continuous horizontal openings not less than 30 inches (762 mm) in clear height extending for at least 80 percent of the length of the sides and no part of such larger tier shall be more than 200 feet (60 960 mm) horizontally from such an opening. In addition, each such opening shall face a street or yard accessible to a street with a width of at least 30 feet (9144 mm) for the full length of the opening, and standpipes shall be provided in each such tier.

Open parking garages of Type II construction, with all sides open, shall be unlimited in allowable area where the building height does not exceed 75 feet (22 860 mm). For a side to be considered open, the total area of openings along the side shall not be less than 50 percent of the interior area of the side at each tier and such openings shall be equally distributed along the length of the tier. All portions of tiers shall be within 200 feet (60 960 mm) horizontally from such openings or other natural ventilation openings as defined in Section 406.3.3.1. These openings shall be permitted to be provided in courts with a minimum width of 30 feet (9144 mm) for the full width of the openings.

412.3.1 Definition. The following word and term shall, for the purposes of this chapter and as used elsewhere in this code, have the meaning shown herein.

RESIDENTIAL AIRCRAFT HANGAR. An accessory building less than 2,000 square feet (186 m²) and 20 feet (6096 mm) in building height, constructed on a one- or two-family residential property where aircraft are stored. Such use will be considered as a residential accessory use incidental to the dwelling.

412.3.6 Height and area limits. Residential aircraft hangars shall not exceed 2,000 square feet (186 m²) in area and 20 feet (6096 mm) in building height.

[F] 415.6.1.6 Coal pockets. Coal pockets located less than 30 feet (9144 mm) from interior lot lines or from structures on the same lot shall be constructed of not less than Type IB construction. Where more than 30 feet (9144 mm) from interior lot lines, or where erected along a railroad right-of-way, the minimum type of construction of such structures not more than 65 feet (19 812 mm) in building height shall be Type IV.

CHAPTER 5 GENERAL BUILDING HEIGHTS AND BUILDING AREAS

[F] 905.3.1 (IFC 905.3.1) Building hHeight. Class III standpipe systems shall be installed throughout buildings where the floor level of the highest story is located more than 30 feet (9144 mm) above the lowest level of fire department vehicle access, or where the floor level of the lowest story is located more than 30 feet (9144 mm) below the highest level of fire department vehicle access.

Exceptions:

1. Class I standpipes are allowed in buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2.
2. Class I manual standpipes are allowed in open parking garages where the highest floor is located not more than 150 feet (45 720 mm) above the lowest level of fire department vehicle access.
3. Class I manual dry standpipes are allowed in open parking garages that are subject to freezing temperatures, provided that the hose connections are located as required for Class II standpipes in accordance with Section 905.5.
4. Class I standpipes are allowed in basements equipped throughout with an automatic sprinkler system.
5. In determining the lowest level of fire department vehicle access, it shall not be required to consider:
 - 5.1. Recessed loading docks for four vehicles or less; and
 - 5.2. Conditions where topography makes access from the fire department vehicle to the building impractical or impossible.

1406.2.2 Architectural trim. In buildings of Type I, II, III and IV construction that do not exceed three stories or 40 feet (12 192 mm) in building height ~~above grade plane~~, exterior wall coverings shall be permitted to be constructed of wood where permitted by Section 1405.4 or other equivalent combustible material. Combustible exterior wall coverings, other than fire-retardant-treated wood complying with Section 2303.2 for exterior installation, shall not exceed 10 percent of an exterior wall surface area where the fire separation distance is 5 feet (1524 mm) or less. Architectural trim that exceeds 40 feet (12 192 mm) in height above grade plane shall be constructed of approved noncombustible materials and shall be secured to the wall with metal or other approved noncombustible brackets.

1509.5.1 Noncombustible construction required. Any tower, spire, dome or cupola that exceeds 60 feet (18 288) in height above the highest point at which it comes in contact with the roof, or that exceeds 200 square feet (18.6 m²) in area at any horizontal section, or which is intended to be used for any purpose other than a belfry or architectural embellishment, shall be entirely constructed of and supported by noncombustible materials. Such structures shall be separated from the building below by construction having fire-resistance rating of not less than 1.5 hours with openings protected with a minimum 1.5-hour fire-protection rating. Structures, except aerial supports 12 feet (3658 mm) high or less, flagpoles, water tanks and cooling towers, placed above the roof of any building more than 50 feet (15 240 mm) in building height, shall be of noncombustible material and shall be supported by construction of noncombustible material.

1808.2.5 Stability. Piers or piles shall be braced to provide lateral stability in all directions. Three or more piles connected by a rigid cap shall be considered braced, provided that the piles are located in radial directions from the centroid of the group not less than 60 degrees (1 rad) apart. A two-pile group in a rigid cap shall be considered to be braced along the axis connecting the two piles. Methods used to brace piers or piles shall be subject to the approval of the building official.

Piles supporting walls shall be driven alternately in lines spaced at least 1 foot (305 mm) apart and located symmetrically under the center of gravity of the wall load carried, unless effective measures are taken to provide for eccentricity and lateral forces, or the wall piles are adequately braced to provide for lateral stability. A single row of piles without lateral bracing is permitted for one- and two-family dwellings and lightweight construction not exceeding two stories or 35 feet (10 668 mm) in building height, provided the centers of the piles are located within the width of the foundation

1915.5 Fire-resistance-rating protection. Pipe columns shall be of such size or so protected as to develop the required fire-resistance ratings specified in Table 601. Where an outer steel shell is used to enclose the fire-resistant covering, the shell shall not be included in the calculations for strength of the column section. The minimum diameter

of pipe columns shall be 4 inches (102 mm) except that in structures of Type V construction not exceeding three stories or 40 feet (12 192 mm) in building height, pipe columns used in the basement and as secondary steel members shall have a minimum diameter of 3 inches (76 mm).

Reason: The code sections in this proposal have one thing in common. They specify requirements for a building based on its height. The IBC does not specify how to determine a building's height and the code user is left with a subjective standard for the measurement. Section 502.1, however, defines "building height" as "the vertical distance from grade plane to the average height of the highest roof surface." Grade plane is also defined in Section 502.1. The proposal will change "height" to "building height" so that the determination is an objective one based on the definitions for building height and grade plane.

This proposal does not include each code section in the IBC that specifies requirements for a building or structure based on its height. There are cases where the determination of their height from grade plane to the average height of the highest roof surface is not warranted or not applicable (e.g., towers, spires, domes, cupolas, etc.). Please refer to Sections 412.1.5, 903.2.10.3, 1509.5, 2109.1.1, 3108.3, 3202.2 and 3310.1.

This proposal also does not include references to the height of a building in terms of distance and number of stories. In these cases, the defined term of building height is not appropriate because it is limited to the height of a building in terms of distance. Please refer to Sections 503.1, 508.3.1.2, 508.3.2.2 and 508.3.3.3, and Table 503.

Note that "building height" is currently used in other sections of the IBC. Please refer to Sections 509.2(5) and 1709.3(2).

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis. While some sections listed are typically the purview of other committees, for consistency, the General Committee will make the determination for entire proposal.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: Cleans up code terminology with regard to building height. ABuilding height® is a defined term whereas Aheight® is not specifically defined.

Assembly Action:

None

Final Hearing Results

G81-06/07

AS

Code Change No: G84-06/07

Original Proposal

Sections: 408.2, 1014.2 (IFC [B] 1014.2)

Proponent: Maureen Traxler, City of Seattle, WA, representing the Washington Association of Building Officials

THIS PROPOSAL IS ON THE AGENDA OF THE IBC GENERAL AND IBC MEANS OF EGRESS CODE DEVELOPMENT COMMITTEES. SEE THE TENTATIVE HEARING ORDER FOR THESE COMMITTEES

PART I – IBC GENERAL

Revise as follows:

408.2 Mixed occupancies. Portions of buildings with an occupancy in Group I-3 that are classified as a different occupancy shall meet the applicable requirements of this code for such occupancies. Where security operations necessitate the locking of required means of egress, provisions shall be made for the release of occupants at all times.

Means of egress from detention and correctional occupancies that traverse other use areas shall, as a minimum, conform to requirements for detention and correctional occupancies.

Exception: It is permissible to exit through a horizontal exit into other contiguous occupancies that do not conform to detention and correctional occupancy egress provisions but that do comply with requirements set forth in the appropriate occupancy, as long as the occupancy is not a ~~high-hazard~~ Group H use.

PART II – IBC MEANS OF EGRESS

Revise as follows:

1014.2 Egress through intervening spaces. Egress through intervening spaces shall comply with this section.

1. Egress from a room or space shall not pass through adjoining or intervening rooms or areas, except where such adjoining rooms or areas are accessory to the area served, are not a ~~high-hazard~~ Group H occupancy and provide a discernible path of egress travel to an exit.

Exception: Means of egress are not prohibited through adjoining or intervening rooms or spaces in a Group H, S or F occupancy when the adjoining or intervening rooms or spaces are the same or a lesser hazard occupancy group.

2. Egress shall not pass through kitchens, storage rooms, closets or spaces used for similar purposes.

Exceptions:

1. Means of egress are not prohibited through a kitchen area serving adjoining rooms constituting part of the same dwelling unit or sleeping unit.
2. Means of egress are not prohibited through stockrooms in Group M occupancies when all of the following are met:
 - 2.1. The stock is of the same hazard classification as that found in the main retail area;
 - 2.2. Not more than 50 percent of the exit access is through the stockroom;
 - 2.3. The stockroom is not subject to locking from the egress side; and
 - 2.4. There is a demarcated, minimum 44-inch-wide (1118 mm) aisle defined by full or partial height fixed walls or similar construction that will maintain the required width and lead directly from the retail area to the exit without obstructions.
3. An exit access shall not pass through a room that can be locked to prevent egress.
4. Means of egress from dwelling units or sleeping areas shall not lead through other sleeping areas, toilet rooms or bathrooms.

Reason: This proposed change clarifies the application of the code section. “High-hazard occupancy” is a vague, undefined term. “Group H occupancy” is the designation commonly used in the IBC for high hazard occupancies—Section 307 is titled “High-hazard Group H”. The Commentary to the 2003 IBC states “egress paths ... must not pass through an extraordinary fire hazard, such as an area of high-hazard use (Group H).” If these provisions are not intended to apply to Group H occupancies, then what is intended?

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

PART I C IBC GENERAL

Committee Action:

Approved as Submitted

Committee Reason: The terminology Ahigh-hazard® is not defined. Revising the terminology to Group H clarifies which specific use classification is intended.

Assembly Action:

None

PART II C IBC MEANS OF EGRESS

Committee Action:

Approved as Submitted

Committee Reason: The proposal was approved to be consistent with the action taken by the General committee in Part I of the proposal for similar language in Section 408.2. The current use of the term Ahigh hazard® is not defined. The revised language clarifies that the intent is for all Group H occupancies.

Assembly Action:

None

Final Hearing Results

G84-06/07, Part I	AS
G84-06/07, Part II	AS

Code Change No: **G86-06/07**

Original Proposal

Section: 410.3.5

Proponent: William Conner, ASTC, Bill Conner Associates LLC, representing the American Society of Theatre Consultants

Revise as follows:

410.3.5 Proscenium curtain. Where a proscenium wall is required to have a fire-resistance rating, the stage opening shall be provided with a fire curtain of approved material or an approved water curtain complying with Section 903.3.1.1 or, in facilities not utilizing the provisions of smoke protected assembly seating in accordance with Section 1025.6.2, a smoke control system complying with Section 909 or natural ventilation designed to maintain the smoke level at least 6 feet (1829 mm) above the floor of the means of egress. The fire curtain shall be designed and installed to intercept hot gases, flames and smoke and to prevent a glow from a severe fire on the stage from showing on the auditorium side for a period of 20 minutes. The closing of the fire curtain from the full open position shall be accomplished in less than 30 seconds, with the last 8 feet (2438 mm) of travel requiring 5 or more seconds for full closure.

Reason: The proscenium opening protection is provide to afford occupants more time for egress. This change will permit facilities designed for entertainment better and more options to do this. In many large venues such as arenas where the amount of combustibile materials may exceed that found on stages by an order of magnitude, smoke control is relied upon to protect the audience from burning scenery, curtains, properties, mobile homes, boats, etc. Fire safety curtains don't fit or obstruct the production in many modern theatres. The requirements for m.o.e. today are vastly superior to the era before electricity when stage fires were a hazard; sprinkler technology is well developed and very effective; and the construction type limits combustibles. Together with engineered smoke control systems, the occupants will be much better protected from the hazards of fire than with a proscenium curtain or deluge system. This change would be a move towards a more performance-based design. The cost impact would be no significant change or actually lower cost of construction.

A similar proposal was submitted in the 2002 code change cycle and the reason given for rejection was that combining smoke protected assembly seating with proscenium opening protection was "double dipping". This proposal eliminates that possibility of utilizing smoke control for both proscenium opening protection and increased egress time.

Cost Impact: This code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: Provides additional option to the designer through a direct reference to the smoke control requirements in Section 909 and for the use of natural ventilation as long as the layer is held at 6 feet above the floor of the means of egress.

Assembly Action:

None

Final Hearing Results

G86-06/07

AS

Code Change No: **G87-06/07**

Original Proposal

Sections: 410.3.5, 410.3.5.1, 410.3.5.2, 410.3.5.3, 410.3.5.4, Chapter 35

Proponent: William Conner, ASTC, Bill Conner Associates LLC, representing the American Society of Theatre Consultants

1. Revise as follows:

410.3.5 Proscenium curtain. Where a proscenium wall is required to have a fire-resistance rating, the stage opening shall be provided with a fire curtain of approved material complying with NFPA 80 or an approved water curtain complying with Section 903.3.1.1. ~~The fire curtain shall be designed and installed to intercept hot gases, flames and smoke and to prevent a glow from a severe fire on the stage from showing on the auditorium side for a period of 20 minutes. The closing of the fire curtain from the full open position shall be accomplished in less than 30 seconds, with the last 8 feet (2438 mm) of travel requiring 5 or more seconds for full closure.~~

1. Delete without substitution:

410.3.5.1 Activation. ~~The curtain shall be activated by rate-of-rise heat detection installed in accordance with Section 907.10 operating at a rate of temperature rise of 15 to 20°F per minute (8 to 11°C per minute), and by an auxiliary manual control.~~

410.3.5.2 Fire test. ~~A sample curtain with a minimum of two vertical seams shall be subjected to the standard fire test specified in ASTM E 119 for a period of 30 minutes. The curtain shall overlap the furnace edges by an amount that is appropriate to seal the top and sides. The curtain shall have a bottom pocket containing a minimum of 4 pounds per linear foot (5.9 kg/m) of batten. The exposed surface of the curtain shall not glow, and flame or smoke shall not penetrate the curtain during the test period. Unexposed surface temperature and hose stream test requirements are not applicable to the proscenium fire safety curtain test.~~

410.3.5.3 Smoke test. ~~Curtain fabrics shall have a smoke-developed rating of 25 or less when tested in accordance with ASTM E 84.~~

410.3.5.4 Tests. ~~The completed proscenium curtain shall be subjected to operating tests prior to the issuance of a certificate of occupancy.~~

3. Revise standard in Chapter 35 as follows:

NFPA

80—99-07 Fire Doors and Other Opening Protectives ~~Fire Windows~~

Reason: The existing criteria are outdated and not thorough. The proposed referenced standard began to incorporate requirements for Fire Safety Curtains in 1998 and in this edition for the first time there is an ANSI standard representing a broad consensus of interest and affected parties. It is much more complete, thorough, and performance based than current or previous standards. Unofficial draft is attached.

Cost Impact: The code change proposal will increase the cost of this component for a significant number of stages because it requires motorizing to increase reliability and permit much greater closing forces to overcome the effects of dirt, rust, and age.

Analysis: The edition of the standard proposed was not available for review at the time the monograph was published.

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The updated version of the referenced standard was not available for review.

Assembly Action:

None

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Bill Conner, representing himself, requests Approval as Submitted.

Commenter's Reason: The updated standard, NFPA 80-07 Fire Doors and Other Opening Protectives is now available.

Analysis: Review of the proposed new standards indicated that in the opinion of ICC Staff, the standard complies with ICC Standards criteria.

Final Hearing Results

G87-06/07

AS

Code Change No: **G89-06/07**

Original Proposal

Section: 411.7, Chapter 35

Proponent: Manny Muniz, Manny Muniz Associates, LLC

1. Revise as follows:

411.7 Exit marking. Exit signs shall be installed at the required exit or exit access doorways of amusement buildings. Approved directional exit markings shall also be provided. Where mirrors, mazes or other designs are utilized that disguise the path of egress travel such that they are not apparent, approved and listed low-level exit signs that comply with Section 1011.4, and directional path markings listed in accordance with UL 1994, shall be provided and located not more than 8 inches (203 mm) above the walking surface and on or near the path of egress travel. Such markings shall become visible in an emergency. The directional exit marking shall be activated by the automatic fire detection system and the automatic sprinkler system in accordance with Section 907.2.11.2.

2. Add standard to Chapter 35 as follows:

Underwriters Laboratories

UL 1994-04 Luminous Egress Path Marking Systems, with revisions through February 2005

Reason: To clarify that low-level exit signs and directional path markings shall be listed. Presently, Section 7.10.7.1 requires internally illuminated exit signs be listed. Section 411.7 does not reference this requirement. UL 924, Standard for Safety Emergency Lighting and Power Equipment, has specific electrical and performance test criteria for exit signs in general, and an additional test for impact damage for exit signs installed at floor-level. Without a referenced safety and performance standard, the AHJ must make their own determination as to whether an exit sign is safe to use or that it will perform for 90 minutes in the event of primary power loss.

Likewise, Section 411.7 does not reference a test standard for directional path markings. UL 1994, Standard for Luminous Egress Path Marking Systems, has specific safety and performance test criteria for egress path marking systems. Without a referenced safety and performance standard, the AHJ must make their own determination as to whether a directional path marking system is safe to use or that it will perform for 90 minutes in the event of primary power loss.

The Life Safety Code (NFPA 101), which is used in every state in the US, contains similar requirements in Section 7.10.1.7 and 7.10.7.1 for floor-proximity egress path marking systems and exit signs to be tested and listed. The IBC should not be less stringent.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: Code changes being heard by the MOE Development committee deal with similar issues related the photoluminous egress markings. The standard UL 1994-05 has been reviewed for compliance with ICC Council Policy #28, Section 3.6. In the opinion of ICC Staff, the standard complies with ICC Criteria for referenced standards.

Public Hearing Results

Note: The following analysis was not in the Code Change Proposal book but was published in the AErrata to the 2006/2007 Proposed Changes to the International Codes and Analysis of Proposed Referenced Standards® provided at the code development hearings:

Analysis: Review of the proposed new standard indicated that, in the opinion of ICC Staff, the standards did comply with ICC standards criteria.

Committee Action:

Approved as Submitted

Committee Reason: Provides specific direction to jurisdictions as to which standards applies to low level exit signs and directional path markings.

Assembly Action:

None

Final Hearing Results

G89-06/07

AS

Code Change No: G92-06/07

Original Proposal

Sections: 419 (New), 310.1, 508.3.1; IRC R101.2

Proponent: David S. Collins, FAIA, The Preview Group, Inc., representing the American Institute of Architects

THIS PROPOSAL IS ON THE AGENDA OF THE IBC GENERAL AND IRC BUILDING/ENERGY CODE DEVELOPMENT COMMITTEES. SEE THE TENTATIVE HEARING ORDER FOR THESE COMMITTEES

PART I – IBC

1. Add new text as follows:

SECTION 419
LIVE/WORK UNITS

419.1 General. A live/work unit is a dwelling unit or sleeping unit in which a significant portion of the space includes a non-residential use which is operated by the tenant and shall comply with Section 419.

Exception: Dwelling units or sleeping units which include an office that is less than 10% of the area of the dwelling unit shall not be classified as a live/work unit.

419.1.1 Limitations: The following shall apply to all live/work areas:

1. The live/work unit is permitted to be a maximum of 3,000 sq ft;
2. The non-residential area is permitted to be a maximum 50% of the area of each live/work unit;
3. The non-residential area function shall be limited to the first or main floor only of the live-work unit; and
4. A maximum of 5 non-residential worker or employees are allowed to occupy the non-residential area at any one time.

419.2 Occupancies. Live/work units shall be classified as a Group R-2 occupancy. Separation requirements found in Section 508.3 shall not apply when the live/work unit is in compliance with Section 419. High hazard and storage occupancies shall not be permitted in a live/work unit. The aggregate of storage in the live/work unit shall be limited to 10% of the space dedicated to non-residential activities.

419.3 Means of egress. Except as modified by this section, the provisions for Group R-2 occupancies in Chapter 10 shall apply to the entire live/work unit.

419.3.1 Egress capacity. The egress capacity for each element of the live/work unit shall be based on the occupancy load for the occupancy served in accordance with Table 1004.1.1.

419.3.2 Sliding doors. Where doors in a means of egress are of the horizontal-sliding type, the force to slide the door to its fully open position shall not exceed 50 pounds (220 N) with a perpendicular force against the door of 50 pounds (220 N).

419.3.3 Spiral stairs. Spiral stairs that conform to the requirements of Section 1009.8 shall be permitted.

419.3.4 Locks. Egress doors shall be permitted to be locked in accordance Exception 4 of Section 1008.1.8.3.

419.4 Vertical openings. Floor opening between floor levels of a live/work unit is permitted without enclosure.

419.5 Fire protection. The live-work unit shall be provided with a monitored fire alarm system where required by Section 907.2.9, and a fire sprinkler system in accordance with Section 903.2.7.

419.6 Structural. Floor loading for the areas within a live/work unit shall be designed to conform to Table 1607.1 based on the function within the space.

419.7 Accessibility. The applicable requirements of Chapter 11 shall apply to each area within the live/work unit.

419.8 Ventilation. The applicable requirements of the *International Mechanical Code* shall apply to each area within the live/work unit for the function within that space.

(Renumber subsequent sections)

2. Revise as follows:

310.1 Residential Group R. Residential Group R includes, among others, the use of a building or structure, or a portion thereof, for sleeping purposes when not classified as an Institutional Group I or when not regulated by the *International Residential Code* in accordance with Section 101.2. Residential occupancies shall include the following:

R-1 Residential occupancies containing sleeping units where the occupants are primarily transient in nature, including:

- Boarding houses (transient)
- Hotels (transient)
- Motels (transient)

R-2 Residential occupancies containing sleeping units or more than two dwelling units where the occupants are primarily permanent in nature, including:

- Apartment houses
- Boarding houses (not transient)
- Convents
- Dormitories
- Fraternities and sororities
- Hotels (nontransient)
- Live/work units
- Monasteries
- Motels (nontransient)
- Vacation timeshare properties

Congregate living facilities with 16 or fewer occupants are permitted to comply with the construction requirements for Group R-3.

R-3 Residential occupancies where the occupants are primarily permanent in nature and not classified as Group R-1, R-2, R-4 or I, including:

- Buildings that do not contain more than two dwelling units.
- Adult facilities that provide accommodations for five or fewer persons of any age for less than 24 hours.
- Child care facilities that provide accommodations for five or fewer persons of any age for less than 24 hours.

Congregate living facilities with 16 or fewer persons.
Adult and child care facilities that are within a single-family home are permitted to comply with the *International Residential Code*.

- R-4** Residential occupancies shall include buildings arranged for occupancy as residential care/assisted living facilities including more than five but not more than 16 occupants, excluding staff.
Group R-4 occupancies shall meet the requirements for construction as defined for Group R-3, except as otherwise provided for in this code, or shall comply with the *International Residential Code*.

3. Revise as follows:

508.3.1 Accessory occupancies. Accessory occupancies are those occupancies subsidiary to the main occupancy of the building or portion thereof. Aggregate accessory occupancies shall not occupy more than 10 percent of the area of the story in which they are located and shall not exceed the tabular values in Table 503, without height and area increases in accordance with Sections 504 and 506 for such accessory occupancies.

Exceptions:

1. Accessory assembly areas having a floor area less than 750 square feet (69.7 m²) are not considered separate occupancies.
2. Assembly areas that are accessory to Group E occupancies are not considered separate occupancies except when applying the assembly occupancy requirements of Chapter 11.
3. Accessory religious educational rooms and religious auditoriums with occupant loads of less than 100 are not considered separate occupancies.
4. Live/work units in accordance with Section 419 are not considered separate occupancies.

PART II – IRC

Revise as follows:

R101.2 Scope. The provisions of the *International Residential Code for One- and Two-family Dwellings* shall apply to the construction, alteration, movement, enlargement, replacement, repair, equipment, use and occupancy, location, removal and demolition of detached one- and two-family dwellings and townhouses not more than three stories above-grade in height with a separate means of egress and their accessory structures.

Exception: Live/work units complying with the requirements of Section 419 of the *International Building Code* shall be permitted to be built as one- and two-family dwellings or townhouses. Fire suppression required by Section 419.5 of the *International Building Code* when constructed under the *International Residential Code for One- and Two-family Dwellings* shall conform to Section 903.3.1.3 of the *International Building Code*.

Reason: IBC. This code change creates a live/work unit that is considered to be an R-2 dwelling for application of the code. Several limitations and specific requirements that are to be applied to both the dwelling portion of the unit and the work portion of the unit are itemized. Fire suppression is required throughout a building containing a live/work unit; ventilation and structural requirements must be applied based on the function in the space, and these criteria are applicable whether the unit is in an IBC or IRC building.

The current IBC and IRC do not allow residential live-work units in a form that is typically desirable for community development. This increasingly popular concept of design and construction allows a public service business, with employees working within a residence and allows the public to enter the work area of the unit to acquire service. Some examples of live-work commercial functions are artist's studios, coffee shops and chiropractor's offices. It is important to note that live-work is specifically not to apply to an in home office (architect home office, consultant home office, et al).

These throwbacks to 1900 era planning, created a community where residents could walk to all needed services such as the typical corner commercial store scattered across many old cities. Live-work units began to re-emerge in the 1990's through a development style known as "Traditional Neighborhood Design" (TND). More recently, adaptive reuse of many older urban structures in city centers incorporated the same live-work tools to provide a variety of residential unit types.

Historically, the building codes did not have to deal with the live-work issue by zoning codes which generally precluded a mix of uses within a neighborhood, much less within a building. However, recent planning trends adopted by many jurisdictions, encourage the mixing of commercial and residential uses, not just in neighborhoods, but also in buildings, and even within unit types, such as the live-work unit commonly found in TND projects.

The live-work approach is also driven by the desire to provide affordable housing. Many cities and towns struggle with their revival also driving real estate values up and driving service level citizens out of their community. These jurisdictions want a full range of citizens to be able to both work and live in their community. They aggressively pursue affordable housing, with the *International Residential Code* (IRC) being a key tool in this effort. The IRC allows jurisdictions to produce a range of housing types at competitive market values. Included among these is the live-work unit.

There are no provisions for any use other than residential in the IRC. Since live-work units mix in a commercial use, they are driven out of the IRC, into the IBC. When this happens, the live-work units incur an increase in code related construction requirements (use separation, construction type, egress, fire prevention) far in excess of any risk present in the work function. The added requirements drive the construction cost up, and inevitably drive the units out of the affordable housing range.

The provisions in the IBC are intended to apply to buildings which contain live/work units and would conform in general with the R-2 provisions. In addition, a code change has been proposed to the IRC referencing this section for the criteria that would be appropriate for live/work units built under that code. Obviously, the method by which mixed use unseparated is applied is critical to the usefulness of the live/work concept.

This proposal allows mixed use unseparated occupancies within the dwelling unit or sleeping unit that meets the limits of this section to be classified as an R-2 occupancy. Any occupancy that is not within a dwelling unit would have to be treated as a mixed use condition and would be separated per the IBC. Special features that are common within a dwelling unit and are likely within the live/work unit are addressed in order to clearly delineate the means for designing a live/work unit.

Of concern to many Code Officials and Architects alike is the problem posed by the absence of any live-work provision in the IRC or IBC. Too often, this results in one of two poor choices: a) either the owner misrepresents the proposed "work" use, or b) the Code Officials are encouraged to look the other way, ignoring the "work" use. Consequently, conscientious Code Officials and Architects desire a code compliance tool that addresses their live-work predicament, allowing them to solve this problem as an integral part of a project's code compliance strategy, while still providing affordable residential units.

IRC. This code change creates a live/work unit that is considered to be an R-2 dwelling for application of the code. Several limitations and specific requirements that are to be applied to both the dwelling portion of the unit and the work portion of the unit are itemized. Fire suppression is required throughout a building containing a live/work unit; ventilation and structural requirements must be applied based on the function in the space, and these criteria are applicable whether the unit is in an IBC or IRC building.

The current IBC and IRC do not allow residential live-work units in a form that is typically desirable for community development. This increasingly popular concept of design and construction allows a public service business, with employees working within a residence and allows the public to enter the work area of the unit to acquire service. Some examples of live-work commercial functions are artist's studios, coffee shops and chiropractor's offices. It is important to note that live-work is specifically not to apply to an in home office (architect home office, consultant home office, et al).

These throwbacks to 1900 era planning, created a community where residents could walk to all needed services such as the typical corner commercial store scattered across many old cities. Live-work units began to re-emerge in the 1990's through a development style known as "Traditional Neighborhood Design" (TND). More recently, adaptive reuse of many older urban structures in city centers incorporated the same live-work tools to provide a variety of residential unit types.

Historically, the building codes did not have to deal with the live-work issue by zoning codes which generally precluded a mix of uses within a neighborhood, much less within a building. However, recent planning trends adopted by many jurisdictions, encourage the mixing of commercial and residential uses, not just in neighborhoods, but also in buildings, and even within unit types, such as the live-work unit commonly found in TND projects.

The live-work approach is also driven by the desire to provide affordable housing. Many cities and towns struggle with their revival also driving real estate values up and driving service level citizens out of their community. These jurisdictions want a full range of citizens to be able to both work and live in their community. They aggressively pursue affordable housing, with the *International Residential Code* (IRC) being a key tool in this effort. The IRC allows jurisdictions to produce a range of housing types at competitive market values. Included among these is the live-work unit.

There are no provisions for any use other than residential in the IRC. Since live-work units mix in a commercial use, they are driven out of the IRC, into the IBC. When this happens, the live-work units incur an increase in code related construction requirements (use separation, construction type, egress, fire prevention) far in excess of any risk present in the work function. The added requirements drive the construction cost up, and inevitably drive the units out of the affordable housing range.

The provisions in the IBC are intended to apply to buildings which contain live/work units and would conform in general with the R-2 provisions. In addition, a code change has been proposed to the IRC referencing this section for the criteria that would be appropriate for live/work units built under that code. Obviously, the method by which mixed use unseparated is applied is critical to the usefulness of the live/work concept.

This proposal allows mixed use unseparated occupancies within the dwelling unit or sleeping unit that meets the limits of this section to be classified as an R-2 occupancy. Any occupancy that is not within a dwelling unit would have to be treated as a mixed use condition and would be separated per the IBC. Special features that are common within a dwelling unit and are likely within the live/work unit are addressed in order to clearly delineate the means for designing a live/work unit.

Of concern to many Code Officials and Architects alike is the problem posed by the absence of any live-work provision in the IRC or IBC. Too often, this results in one of two poor choices: a) either the owner misrepresents the proposed "work" use, or b) the Code Officials are encouraged to look the other way, ignoring the "work" use. Consequently, conscientious Code Officials and Architects desire a code compliance tool that addresses their live-work predicament, allowing them to solve this problem as an integral part of a project's code compliance strategy, while still providing affordable residential units.

Cost Impact: The code change proposal will increase the cost of construction. There is no way to calculate the actual impact because this is a design concept that is new to the code, and except when it has been allowed through an appeal or variance process, hasn't been widely used. The criteria are generally limitations that are designed to aid the designer/owner and building official to appropriately use the live/work concept, many of which are already within the code and will have little cost impact (sprinklers/alarms/etc.). The unique feature of this proposal in concert with the proposal to the IRC is the use of the IBC criteria for a building built under the IRC.

Analysis: Regarding the Chapter 11 reference in proposed Section 419.7, would a live/work area be considered part of a dwelling unit in the consideration of the Type A and Type B unit requirements, particularly the multistory dwelling unit exception?

Public Hearing Results

PART I C IBC

Committee Action:

Approved As Submitted

Committee Reason: Though there were several minor concerns with the proposal the need for such provisions was seen as critical and it was pointed out that within the IBC all Group R occupancies will be sprinklered. This proposal will allow the building code to keep pace with development and revisions to zoning laws which allow such development.

Assembly Action:

None

PART II C IRC**Committee Action:****Approved as Submitted**

Committee Reason: The proposed language helps make it clear that live/work units are required to have fire suppression throughout. This additional language provides needed clarity as to the intent and aids the code official.

Assembly Action:**None**

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because public comments were submitted for Part I.

Public Comment 1:

Ronald Nickson, National Multi Housing Council, requests Approval as Modified by this public comment for Part I.

Modify proposal as follows:

419.7 Accessibility. ~~Accessibility shall be designed in accordance with Chapter 11. The applicable requirements of Chapter 11 shall apply to each area within the live/work unit.~~

(Portions of proposal not shown remain unchanged)

Commenter's Reason: To clarify the requirements for accessibility. The requirement that each area of the unit meet the accessibility requirements could trigger a requirement for an elevator to the second floor living area of units designed to have the first floor be used as the work area.

Final Hearing Results

G92-06/07, Part I	AMPC1
G92-06/07, Part II	AS

Code Change No: G98-06/07

Original Proposal

Section: 502.1

Proponent: Maureen Traxler, City of Seattle, WA, representing the Washington Association of Building Officials

Delete definition without substitution:

502.1 Definitions. The following words and terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

HEIGHT, STORY. ~~The vertical distance from top to top of two successive finished floor surfaces; and, for the topmost story, from the top of the floor finish to the top of the ceiling joists or, where there is not a ceiling, to the top of the roof rafters.~~

Reason: The purpose of this code change proposal is to delete an unnecessary definition. The definition of "story" contains the same information as the definition of "story height". Furthermore, the term "story height" is used only once in the 2006 IBC. It is used in Section 2106.5.2 in the context of design of masonry shear walls in high Seismic Design Categories. If this definition is needed, it should be moved to Chapter 21.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: This definition which is located in Chapter 5 is redundant with the definition of story height in Chapter 2 and is only used in Chapter 21 of the IBC therefore should be deleted from Chapter 5.

Assembly Action:

None

Final Hearing Results

G98-06/07

AS

Code Change No: **G110-06/07**

Original Proposal

Section: 503

Proponent: Philip Brazil, PE, Reid Middleton, Inc., representing himself

Revise as follows:

503.1 General. ~~The height and area for of a buildings of different construction types shall be governed by the intended use of the building and shall not exceed the limits specified in Table 503 based on the type of construction as determined by Section 602 and the occupancies as determined by Section 302 except as modified hereafter. Each part portion of a building included within the exterior walls or the exterior walls and fire walls where provided separated by one or more fire walls complying with Section 705 shall be permitted considered to be a separate building.~~

Reason: The purpose of the proposal is to establish technically sound charging language for the provisions of Section 503. The current language references buildings of different construction types but not buildings of a single construction type. Section 602.1 requires buildings to be classified into a single construction type. Section 503, however, is silent on buildings complying with Section 602.1. Section 705.1 permits portions of a building separated by fire walls to be considered as separate buildings. This, in turn, provides the option of classifying portions of buildings separated by fire walls into different types of construction. Section 503, however, is also silent on buildings complying with Section 705.1. Section 503 limits the height and area of a building with different types of construction by reference to Table 503. Table 503, however, is silent on its application to buildings with different types of construction.

Section 503.1 permits a portion of a building included within the exterior walls or the exterior walls and fire walls to be a separate building. A portion of a building included within the exterior walls is not a portion of a building but is the entire building. Permitting a portion of a building separated by one or more fire walls to be a separate building challenges the laws of physics. A portion of a building separated from the remainder of the building by a fire wall is still a portion of a building but it can be considered as a separate building for the purposes of compliance with the IBC when the fire wall complies with Section 705.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: Based upon proponents request. See committee reason for G10-06/07.

Assembly Action:

None

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Philip Brazil, PE, Reid Middleton, representing himself, requests Approval as Submitted.

Commenter's Reason: At the 2006/2007 ICC code development hearings in Orlando, I agreed to ask for disapproval in conjunction with the initiative by several organizations to pursue resolution to the ongoing differences over the IBC provisions for allowable building heights and building areas, specifically through the efforts of the ICC Code Technology Committee. At the time of the deadline to submit public comments for consideration at the final action hearings in Rochester, that effort was ongoing. Consequently, I am asking for approval as submitted based on the original reason statement.

Final Hearing Results

G110-06/07

AS

Code Change No: G125-06/07

Original Proposal

Sections: 506.4 (New), 506.1.1, 506.4, 506.4.1

Proponent: Philip Brazil, PE, Reid Middleton, Inc., Everett, WA, representing himself

Revise as follows:

506.4 Buildings with more than one story. The total allowable building area of a building with more than one story shall be determined in accordance with Section 506.4. The actual aggregate building area at all stories in the building shall not exceed the total allowable building area.

Exception: Portions of the building not required to be included in the total allowable building area, as specified in Section 506.4.1, shall be permitted to be excluded from the actual aggregate building area.

506.4.1 506.1.1 Basements. A single basement that is not a story above grade plane need not be included in the total allowable building area, provided such basement does not exceed the area permitted for a building with no more than one story above grade plane.

506.4.2 506.4 Area determination. The ~~maximum~~ total allowable building area of a building with more than one story above grade plane shall be determined by multiplying the allowable area ~~of the first per~~ story (A_a), as determined in Section 506.1, by the number of stories above grade plane as listed below:

1. For buildings with two stories above grade plane, multiply by 2;
2. For buildings with three or more stories above grade plane, multiply by 3; and
3. No story shall exceed the allowable area per story (A_a), as determined in Section 506.1, for the occupancies on that story.

Exceptions:

1. Unlimited area buildings in accordance with Section 507.
2. The maximum area of a building equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.2 shall be determined by multiplying the allowable area per story (A_a), as determined in Section 506.1, by the number of stories above grade plane.

506.4.2.1 506.4.1 Mixed occupancies. In buildings with mixed occupancies, the allowable area per story (A_a) shall be based on the most restrictive provisions for each occupancy when the mixed occupancies are treated according to Section 508.3.2. When the occupancies are treated according to Section 508.3.3 as separated occupancies, the maximum total building area shall be such that the sum of the ratios for each such area on all floors as calculated according to Section 508.3.3.2 shall not exceed 2 for two-story buildings and 3 for buildings three stories or higher.

Reason: The purpose of this proposal is to organize the technical provisions for determining the total allowable building area in buildings with more than one story in a more logical manner and provide charging language where needed. Section 503.1 establishes the allowable building height and the allowable area per story (A_a) by reference to Table 503. Section 506.1 determines increases in the allowable building height and allowable area per story (A_a) through application of the provisions in Section 506.2 for frontage and Section 506.3 for automatic fire sprinkler systems.

Section 506.1.1, which is a continuation of Section 506.1, exempts a single basement from being included in the total allowable area. The meaning of “total allowable area” is not clear but, presumably, it is a reference to the total allowable building area in buildings with more than one story. Section 506.1, however, is not applicable to the total allowable area. The provisions for determining the total allowable building area are found in Section 506.4.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Modified

Modify proposal as follows:

506.4 Buildings with more than one story. The total allowable building area of a building with more than one story shall be determined in accordance with this section. ~~Section 506.4.~~ The actual aggregate building area at all stories in the building shall not exceed the total allowable building area.

Exception: Portions of the building not required to be included in the total allowable building area, as specified in Section 506.4.1, shall be permitted to be excluded from the actual aggregate building area.

(Portions of proposal not shown remain unchanged)

Committee Reason: The proposal clarifies and provides proper structure to the total building area requirements. The modification is simply related to how the applicable provisions are referenced.

Assembly Action:

None

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Maureen Traxler, City of Seattle Department of Planning and Development requests Approval as Modified by this public comment.

Further modify proposal as follows:

506.4 Buildings with more than one story. The total allowable building area of a building with more than one story shall be determined in accordance with this section. The actual aggregate building area at all stories in the building shall not exceed the total allowable building area.

~~**Exception:** Portions of the building not required to be included in the total allowable building area, as specified in Section 506.4.1, shall be permitted to be excluded from the actual aggregate building area.~~

~~**506.4.1 Basements.** A single basement that is not a story above grade plane need not be included in the total allowable building area, provided such basement does not exceed the area permitted for a building with no more than one story above grade plane.~~

(Portions of proposal not shown remain unchanged)

~~**Commenter's Reason:** This is an editorial comment, intended to simplify Section 506.4. The exception in the original proposal is merely a cross reference to the new Section 506.4.1. It's much simpler to reformat Section 506.4.1 as an exception to 506.4.~~

Final Hearing Results

G125-06/07

AMPC1

Code Change No: **G131-06/07**

Original Proposal

Sections: 508.2, 508.2.1, 508.2.2, 508.2.2.1, 508.2.3, 407.2.1, 407.2.3, 706.3.6, 706.3.8, 706.5, [F] 903.2.13 (IFC 903.2.13), [F] Table 903.2.13 (IFC Table 903.2.13), 3410.6.18 (IEBC [B] 1301.6.19), Table 3410.6.18 (IEBC [B] Table 1301.6.19)

Proponent: Philip Brazil, PE, Reid Middleton, Inc., representing himself

Revise as follows:

508.2 Incidental uses. Incidental ~~use areas~~ uses shall comply with the provisions of this section.

Exception: Incidental ~~use areas~~ uses within and serving a dwelling unit are not required to comply with this section.

508.2.1 Occupancy classification. An incidental use area shall be classified in accordance with the occupancy of that portion of the building in which it is located or the building shall be classified as a mixed occupancy and shall comply with Section 508.3.

508.2.2 Separation. Incidental ~~use areas~~ uses shall be separated or protected, or both, in accordance with Table 508.2.

508.2.2.1 Construction. Where Table 508.2 requires a fire-resistance-rated separation, the incidental ~~use areas~~ use shall be separated from the remainder of the building by a fire barrier constructed in accordance with Section 706 or a horizontal assembly constructed in accordance with Section 711, or both. Where Table 508.2 permits an automatic fire-extinguishing system without a fire barrier, the incidental use area shall be separated from the remainder of the building by construction capable of resisting the passage of smoke. The partitions shall extend from the floor to the underside of the fire-resistance-rated floor/ceiling assembly or fire-resistance-rated roof/ceiling ceiling assembly above or to the underside of the floor or roof sheathing, or sub deck above. Doors shall be self- or automatic closing upon detection of smoke. Doors shall not have air transfer openings and shall not be undercut in excess of the clearance permitted in accordance with NFPA 80.

508.2.3 Protection. Where an automatic fire-extinguishing system or an automatic sprinkler system is provided in accordance with Table 508.2, only the areas of the incidental ~~uses~~ areas need be equipped with such a system.

407.2.1 Spaces of unlimited area. Waiting areas and similar spaces constructed as required for corridors shall be permitted to be open to a corridor, only where all of the following criteria are met:

1. The spaces are not occupied for patient sleeping units, treatment rooms, hazardous or incidental ~~use areas~~ uses as defined in accordance with Section 508.2.
2. The open space is protected by an automatic fire detection system installed in accordance with Section 907.
3. The corridors onto which the spaces open, in the same smoke compartment, are protected by an automatic fire detection system installed in accordance with Section 907, or the smoke compartment in which the spaces are located is equipped throughout with quick-response sprinklers in accordance with Section 903.3.2.
4. The space is arranged so as not to obstruct access to the required exits.

407.2.3 Mental health treatment areas. Areas wherein mental health patients who are not capable of self-preservation are housed, or group meeting or multipurpose therapeutic spaces other than incidental ~~use areas~~ uses as defined in accordance with Section 508.2, under continuous supervision by facility staff, shall be permitted to be open to the corridor, where the following criteria are met:

1. Each area does not exceed 1,500 square feet (140 m²).
2. The area is located to permit supervision by the facility staff.
3. The area is arranged so as not to obstruct any access to the required exits.

4. The area is equipped with an automatic fire detection system installed in accordance with Section 907.2.
5. Not more than one such space is permitted in any one smoke compartment.
6. The walls and ceilings of the space are constructed as required for corridors.

706.3.6 Incidental use areas. The fire barrier separating incidental ~~use areas~~ uses from other spaces in the building shall have a fire-resistance rating of not less than that indicated in Table 508.2.

706.3.8 ~~Separation of mixed~~ Separated occupancies. Where the provisions of Section 508.3.3 are applicable, the fire barrier separating mixed occupancies shall have a fire-resistance rating of not less than that indicated in ~~Section~~ Table 508.3.3 based on the occupancies being separated.

706.5 Continuity. Fire barriers shall extend from the top of the floor/ceiling assembly below to the underside of the floor or roof slab or deck above and shall be securely attached thereto. Such fire barriers shall be continuous through concealed spaces, such as the space above a suspended ceiling. The supporting construction for fire barrier walls shall be protected to afford the required fire-resistance rating of the fire barrier supported, except for 1-hour ~~fire-resistance-rated incidental use area separations as~~ fire barriers required by Table 508.2 in buildings of Type IIB, IIIB and VB construction. Hollow vertical spaces within a fire barrier shall be fireblocked in accordance with Section 717.2 at every floor level.

Exceptions:

1. The maximum required fire-resistance rating for assemblies supporting fire barriers separating tank storage as provided for in Section 415.6.2.1 shall be 2 hours, but not less than required by Table 601 for the building construction type.
2. Shaft enclosures shall be permitted to terminate at a top enclosure complying with Section 707.12.

[F] 903.2.13 (IFC 903.2.13) Other required suppression systems. In addition to the requirements of Section 903.2, the provisions indicated in Table 903.2.13 also require the installation of a suppression system for certain buildings and areas.

**[F] TABLE 903.2.13 (IFC TABLE 903.2.13)
ADDITIONAL REQUIRED SUPPRESSION SYSTEMS**

SECTION	SUBJECT
508.2	Incidental use areas <u>uses</u>

(Portions of table not shown remain unchanged)

3410.6.18 (IEBC 1301.6.19) Incidental use. Evaluate the protection of incidental ~~use areas~~ uses in accordance with Section 508.2. Do not include those where this code requires suppression throughout the building including covered mall buildings, high-rise buildings, public garages and unlimited area buildings. Assign the lowest score from Table 3410.6.18 for the building or fire area being evaluated. If there are no specific occupancy areas in the building or fire area being evaluated, the value shall be zero.

**TABLE 3410.6.18 (IEBC TABLE 1301.6.19)
INCIDENTAL USE AREA VALUES^a**

(No changes to table text)

Reason: The purpose of this proposal is to separate the concept of an incidental use from the area of the building in which it is located. An incidental use is an area of special hazard within a separated occupancy. Its use poses a special hazard to the other uses within the separated occupancy. The provisions for accessory occupancies, nonseparated occupancies and separated occupancies are associated with the provisions for incidental uses. Each set of provisions covers classification of the occupancies, limits on areas and heights, and separations (i.e., fire barriers). Specifying incidental use areas as incidental uses will align them with their associated occupancies each of which has separate requirements applicable to its area.

Section 706.3.6 is being revised because the current language implies that the fire barrier separates incidental use areas from each other not necessarily from other spaces in the building (i.e., main occupancies). Reference to "other spaces" is being done for consistency with the same term in Section 508.3.2.1.

In Section 706.3.8, "mixed occupancies" is changed to "separated occupancies" to recognize that, according to Section 508.3, mixed occupancies consist of accessory occupancies, nonseparated occupancies and separated occupancies.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis. While some sections listed are typically the purview of other committees, for consistency, the General Committee will make the determination for entire proposal.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: Clarifies that the code intends to separate uses not use areas from other activities in the building. The uses are the hazard not the area itself.

Assembly Action:

None

Final Hearing Results

G131-06/07

AS

Code Change No: **G133-06/07**

Original Proposal

Sections: 508.2.1, Table 508.2, 508.3.1

Proponent: Philip Brazil, PE, Reid Middleton, Inc., Everett, WA, representing himself

Revise as follows:

508.2.1 Occupancy classification. An incidental use area shall be classified in accordance with the occupancy of that portion of the building in which it is located ~~or the building shall be classified as a mixed occupancy and shall comply with Section 508.3.~~

**TABLE 508.2
INCIDENTAL USE AREAS**

ROOM OR AREA	SEPARATION AND/OR
Furnace room where any piece of equipment is over 400,000 Btu per hour input	1 hour or provide automatic fire-extinguishing system
Rooms with boilers where the largest piece of equipment is over 15 psi and 10 horsepower	1 hour or provide automatic fire-extinguishing system
Refrigerant machinery room	1 hour or provide automatic sprinkler system
Parking garage (Section 406.2)	2 hours; or 1 hour and provide automatic fire-extinguishing System
Hydrogen cut-off rooms, not classified as Group H	1-hour in Group B, F, M, S and U occupancies. 2-hour in Group A, E, I and R occupancies.
Incinerator rooms	2 hours and automatic sprinkler System
Paint shops, not classified as Group H, located in occupancies other than Group F	2 hours; or 1 hour and provide automatic fire-extinguishing System
Laboratories and vocational shops, not classified as Group H, located in Group E or I-2 occupancies	1 hour or provide automatic fire-extinguishing system
Laundry rooms over 100 square feet	1 hour or provide automatic fire-extinguishing system
Storage rooms over 100 square feet	1 hour or provide automatic fire-extinguishing system
Group I-3 cells equipped with padded surfaces	1 hour
Group I-2 waste and linen collection rooms	1 hour
Waste and linen collection rooms over 100 square feet	1 hour or provide automatic fire-extinguishing system
Stationary storage battery systems having a liquid capacity of more than 100 gallons used for facility standby power, emergency power or uninterrupted power supplies	1-hour in Group B, F, M, S and U occupancies. 2-hour in Group A, E, I and R occupancies.

For SI: 1 square foot = 0.0929 m², 1 pound per square inch = 6.9 kPa,
1 British thermal unit per hour = 0.293 watts, 1 horsepower = 746 watts,
1 gallon = 3.785 L

508.3.1 Accessory occupancies. Accessory occupancies are those occupancies subsidiary to the main occupancy of the building or portion thereof. Aggregate accessory occupancies shall not occupy more than 10 percent of the area of the story in which they are located and shall not exceed the tabular values in Table 503, without height and area increases in accordance with Sections 504 and 506 for such accessory occupancies. The provisions for accessory occupancies shall not reduce the requirements for incidental use areas in Section 508.2.

Exceptions:

1. Accessory assembly areas having a floor area less than 750 square feet (69.7 m²) are not considered separate occupancies.
2. Assembly areas that are accessory to Group E occupancies are not considered separate occupancies except when applying the assembly occupancy requirements of Chapter 11.
3. Accessory religious educational rooms and religious auditoriums with occupant loads of less than 100 are not considered separate occupancies.

Reason: The purpose of this proposal is to reestablish the requirements for incidental use areas by eliminating the option of classifying them as mixed occupancies. Incidental use areas are typically areas of special hazard within occupancies. They are typically not classified as separate occupancies. But a few of the areas listed in Table 508.2 are typically classified as separate occupancies, thus diluting the purpose for the requirements imposed on incidental use areas. The proposal will remove the incidental use areas that are typically classified as separate occupancies (storage rooms and parking garages) and restore the requirements for separation and/or protection specified in Table 508.2 to the remaining incidental use areas. Note that storage rooms are typically classified as Group S-1 or S-2 and parking garages are typically classified as Group S-2.

Section 508.2.1 currently requires an incidental use area to be classified in accordance with the occupancy in which it is located, or to be classified as a mixed occupancy and comply with Section 508.3. Section 508.3 requires each portion of a building to be individually classified in accordance with Section 302.1 on classification of occupancies. When a building contains more than one occupancy group, it is required to comply with the provisions for accessory occupancies (Section 508.3.1), nonseparated occupancies (Section 508.3.2), or separated occupancies (Section 508.3.3). The effect of this is to permit an incidental use area to comply with the provisions for accessory occupancies or nonseparated occupancies. Since incidental use areas are typically not classified as separate occupancies, the separation and/or protection typically required for incidental use areas in the absence of these options is eliminated and the special hazard posed by an incidental use area is not addressed. The other areas within the separated occupancy continue to be exposed to the special hazard but are not protected from it.

Removing storage rooms greater than 100 square feet and parking garages from being classified as incidental uses areas will permit them to qualify as accessory occupancies provided they meet the limitations of Section 508.3.1 for accessory occupancies. But that is the case now. This purpose for this proposal is not to change the provisions of the IBC with respect to storage rooms greater than 100 square feet and parking garages. Rather, it is to change the provisions for incidental use areas other than storage rooms greater than 100 square feet and parking garages by restoring the requirements for separation and/or protection specified in Table 508.2.

A prohibition on applying the provisions of Section 508.3.1 for accessory occupancies in order to reduce the requirements of Section 508.2 for incidental use areas is added to Section 508.3.1. Incidental uses are not occupancies but are areas of special hazard within occupancies. Technically, the prohibition is superfluous but it is proposed to ensure that the provisions for accessory occupancies are not misconstrued as a substitute for the requirements for incidental use areas.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: Based upon the request of the proponent. The proponent will come back with a public comment to clean up the proposed language.

Assembly Action:

None

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because public comments were submitted.

Public Comment 2:

Philip Brazil, PE, Reid Middleton, Inc., Everett, WA, representing himself requests Approval as Modified by this public comment.

Modify proposal to revise Section 508.2.2:

508.2.2 Separation. Incidental use areas shall be separated or protected, or both, in accordance with Table 508.2.

Exception: Incidental uses classified as separated occupancies and complying with Section 508.3.3.

(Portions of proposal not shown remain unchanged)

Commenter's Reason: I asked for disapproval at the 2006/2007 ICC code development hearings in Orlando because of concerns raised by some of my colleagues that incidental uses could also be classified as separate occupancies and be required to comply with the provision of Section 508.2 for incidental uses as well as Section 508.3.3 for separated occupancies. In the proposed exception, "incidental uses" are proposed rather than "incidental use areas" for consistency with similar changes in Proposal G131-06/07 (AS). The proposed exception to Section 508.2.2 is intended to answer those concerns. Note that Section 508.2.1 requires an incidental use to be classified in accordance with the occupancy of that portion of the building in which it is located.

Final Hearing Results

G133-06/07

AMPC2

Code Change No: G134-06/07

Original Proposal

Sections: 508.2.2.1, 508.3 through 508.3.3.3

Proponent: Philip Brazil, PE, Reid Middleton, Inc., representing himself

Revise as follows:

508.2.2 Separation. Incidental use areas shall be separated or protected, or both, in accordance with Table 508.2.

508.2.2.1 Construction. Where Table 508.2 ~~requires~~ specifies a fire-resistance-rated separation, the incidental use area shall be separated from the remainder of the building by a fire barrier constructed in accordance with Section 706 or a horizontal assembly constructed in accordance with Section 711, or both. Where Table 508.2 permits an automatic fire-extinguishing system without a fire barrier, the incidental use area shall be separated from the remainder of the building by construction capable of resisting the passage of smoke. The partitions shall extend from the floor to the underside of the fire-resistance-rated floor/ceiling assembly or fire-resistance-rated roof/ceiling assembly above or to the underside of the floor or roof sheathing, or sub deck above. Doors shall be self- or automatic closing upon detection of smoke. Doors shall not have air transfer openings and shall not be undercut in excess of the clearance permitted in accordance with NFPA 80.

508.3 Mixed occupancies. Each portion of a building shall be individually classified in accordance with Section 302.1.

Where a building contains more than one occupancy group, the building or portion thereof shall comply with Sections 508.3.1, 508.3.2, 508.3.3 or a combination of these sections.

Exceptions:

1. Occupancies separated in accordance with Section 509.
2. Where required by Table 415.3.2, areas of Group H-1, H-2 ~~or~~ and H-3 occupancies shall be located in a separate and detached building or structure.

508.3.1 Accessory occupancies. Accessory occupancies are those occupancies subsidiary to the main occupancy of the building or portion thereof. ~~Aggregate accessory occupancies shall not occupy more than 10 percent of the area of the story in which they are located and shall not exceed the tabular values in Table 503, without height and area increases in accordance with Sections 504 and 506 for such accessory occupancies.~~

Exceptions:

1. Accessory assembly areas having a floor area less than 750 square feet (69.7 m²) are not considered separate occupancies.
2. Assembly areas that are accessory to Group E occupancies are not considered separate occupancies except when applying the assembly occupancy requirements of Chapter 11.

3. Accessory religious educational rooms and religious auditoriums with occupant loads of less than 100 are not considered separate occupancies.

508.3.1.1 Occupancy classification. Accessory occupancies shall be individually classified in accordance with Section 302.1. ~~The Code requirements of this code shall apply to each portion of the building based on the occupancy classification of that the accessory space occupancy,~~ except that the most restrictive applicable provisions of Section 403 and Chapter 9 shall apply to the entire building or portion thereof.

508.3.1.2 Allowable area and height. The allowable area and height of the building shall be based on the allowable area and height for the main occupancy in accordance with Section 503.1. The aggregate area of accessory occupancies shall not occupy more than 10 percent of the area of the story in which they are located and shall not exceed the tabular values in Table 503, without height and area increases in accordance with Sections 504 and 506 for such accessory occupancies. The height of ~~any~~ each accessory occupancy shall not exceed the tabular values in Table 503, without height and area increases in accordance with Sections 504 and 506 for such accessory occupancies occupancy.

508.3.1.3 Separation. No separation is required between accessory occupancies ~~or~~ and the main occupancy.

Exception: Group H-2, H-3, H-4 ~~or~~ and H-5 occupancies shall be separated from all other occupancies in accordance with Section 508.3.3.

508.3.2 Nonseparated occupancies. Buildings or portions of buildings that comply with the provisions of this section shall ~~qualify~~ be considered as nonseparated occupancies.

508.3.2.1 Occupancy classification. Nonseparated occupancies shall be individually classified in accordance with Section 302.1. ~~The Code requirements of this code shall apply to each portion of the building based on the occupancy classification of that space except that the most restrictive applicable provisions of Section 403 and Chapter 9 shall apply to the entire building or portion thereof~~ in which the nonseparated occupancies are located.

508.3.2.2 Allowable area and height. (No change to text)

508.3.2.3 Separation. No separation is required between nonseparated occupancies.

Exception: Group H-2, H-3, H-4 ~~or~~ and H-5 occupancies shall be separated from all other occupancies in accordance with Section 508.3.3.

508.3.3 Separated occupancies. Buildings or portions of buildings that comply with the provisions of this section shall ~~qualify~~ be considered as separated occupancies.

508.3.3.1 Occupancy classification. Separated occupancies shall be individually classified in accordance with Section 302.1. Each ~~fire area~~ separated space shall comply with this code based on the occupancy classification of that portion of the building.

508.3.3.2 Allowable area. In each story, the building area shall be such that the sum of the ratios of the actual ~~floor~~ building area of each separated occupancy divided by the allowable area of each separated occupancy shall not exceed one.

508.3.3.3 Allowable height. Each separated occupancy shall comply with the height limitations based on the type of construction of the building in accordance with Section 503.1. The height, in both feet and stories, of each fire area shall be measured from grade plane. This measurement shall include the height, in both feet and stories, of intervening fire areas.

Exception: Special provisions permitted by Section 509.

Reason: The purpose of this proposal is to make editorial and technical improvements in the provisions of Section 508 for mixed occupancies. In Section 508.2.2.1, "requires" is changed to "specifies" because Table 508.2 doesn't require anything. It does, however, specify fire barriers, construction capable of resisting the passage of smoke or an automatic fire-extinguishing system for areas with specific hazards.

The revision to the second exception to Section 508.3 will avoid the assumption that there is a choice in the requirements for locating Group H-1, H-2 and H-3 occupancies in separate and detached buildings or structures. There is not. The areas of all such occupancies are required to be located in separate and detached buildings or structures to the extent that they are located on a site and Table 415.3.2 requires that they be so located. A similar revision is proposed in the exception to Section 508.3.1.3.

The limit on the aggregate area of accessory occupancies is relocated from Section 508.3.1 to Section 508.3.1.2 on allowable area and height for which it is applicable.

The change from the “entire building or portion thereof” to the “building or portion thereof in which the nonseparated occupancies are located” in Section 508.3.2.1 is being done to recognize that a building could have more than one separated occupancy each of which could have one or more nonseparated occupancies.

The change from “fire area” to “separated space” in Section 508.3.3.1 is being done to recognize that there could be more than one fire area within a separated occupancy and for consistency with the current use of “space” in Section 508.3.2.1. There are approximately 50 code sections in the IBC requiring fire barriers that are not necessarily associated with separated occupancies. Refer to the reason statement with code change proposal FS40-03/04 for further information.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: This proposal was approved as it clarifies the language in Section 508. Specifically language such as fire area was removed from Section 508.3.3.1 and the language limiting the area of accessory occupancies to 10 percent was moved from the main section on Accessory occupancies to the area specific to heights and areas for accessory occupancies (Section 508.3.1.2). See also proponents reason.

Assembly Action:

None

Final Hearing Results

G134-06/07

AS

Code Change No: **G137-06/07**

Original Proposal

Section: 508.3.1

Proponent: Gregory R. Keith, Professional heuristic Development, representing the Boeing Company

Revise as follows:

508.3.1 Accessory occupancies. Accessory occupancies are those occupancies subsidiary to the main occupancy of the building or portion thereof. Aggregate accessory occupancies shall not occupy more than 10 percent of the area of the story in which they are located and shall not exceed the tabular values in Table 503, without height and area increases in accordance with Sections 504 and 506 for such accessory occupancies.

Exceptions:

- ~~1. Accessory assembly areas having a floor area less than 750 square feet (69.7 m²) are not considered separate occupancies.~~
- ~~2. Assembly areas that are accessory to Group E occupancies are not considered separate occupancies except when applying the assembly occupancy requirements of Chapter 11.~~
- ~~3. Accessory religious educational rooms and religious auditoriums with occupant loads of less than 100 are not considered separate occupancies.~~

Reason: This proposal is intended to follow up on the reorganization of the mixed occupancy and use provisions introduced in the 2006 Edition of the *International Building Code*. Specifically, it is intended to clarify accessory occupancy provisions. It is proposed to eliminate the three current exceptions. These exceptions are a result of the somewhat vague nature of accessory use areas contained in previous editions of the IBC. As such, they are at odds with the current accessory occupancy provisions. Specifically, Section 508.3.1.1 states, “Accessory occupancies shall be individually classified in accordance with Section 302.1. Code requirements shall apply to each portion of the building based on the occupancy classification of that accessory space, except that the most restrictive applicable provisions of Section 403 and Chapter 9 shall apply to the entire building or portion thereof.” Traditionally, the exceptions have been employed to allow such buildings to have allowable areas based on the main occupancy of the building and to avoid occupancy separations. The reality is that each of these goals can be achieved using current provisions, without the exceptions. The key difference is that if there are any specific requirements that are normally associated with a given occupancy, they must be acknowledged. Exception 1 is almost moot inasmuch as assembly uses (whether they are accessory or not) less than 750 square feet, would seldom be classified as separate occupancies. New Section 303.1, Exceptions 2 and 3 already appropriately address this condition. If it is truly felt that all inclusive educational and religious occupancies be permitted, such provisions should be contained within the specific occupancy

sections in Chapter 3. It should be noted that a similar proposal was defeated during the previous code development cycle. The 2006 IBC accessory occupancy provisions clarify that they are intended only to define a mixed occupancy design option. They are not intended to relieve any pertinent code requirement. Approval of this proposal will clarify accessory occupancy provisions in the IBC and promote needed uniformity in the treatment of these important areas.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: Concern that essential exceptions such as item 2 that allows assembly spaces in Group E occupancies to be considered as part of the Group E occupancy would be lost.

Assembly Action:

None

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Gregory R. Keith, Professional heuristic Development, representing the Boeing Company requests Approval as Modified by this public comment.

Modify proposal as follows:

303.1 Assembly Group A. Assembly Group A occupancy includes, among others, the use of a building or structure, or a portion thereof, for the gathering of persons for purposes such as civic, social or religious functions; recreation, food or drink consumption; or awaiting transportation.

Exceptions:

1. A building or tenant space used for assembly purposes with an occupant load of less than 50 persons shall be classified as a Group B occupancy.
2. A room or space used for assembly purposes with an occupant load of less than 50 persons and accessory to another occupancy shall be classified as a Group B occupancy or as part of that occupancy.
3. A room or space used for assembly purposes that is less than 750 square feet (70 m²) in area and accessory to another occupancy shall be classified as a Group B occupancy or as part of that occupancy.
4. Assembly areas that are accessory to Group E occupancies are not considered separate occupancies except when applying the assembly occupancy requirements of Chapter 11.
5. Accessory religious educational rooms and religious auditoriums with occupant loads of less than 100 are not considered separate occupancies.

(Remainder of section unchanged)

(Portions of proposal not shown remain unchanged)

Commenter's Reason: This proposal is intended to follow up on the reorganization of the mixed occupancy and use provisions introduced in the 2006 Edition of the International Building Code. Specifically, it is intended to clarify accessory occupancy provisions. It is proposed to eliminate the three current exceptions. These exceptions are a result of the somewhat vague nature of accessory use areas contained in previous editions of the IBC. As such, they are at odds with the current accessory occupancy provisions. Specifically, Section 508.3.1.1 states, "Accessory occupancies shall be individually classified in accordance with Section 302.1. Code requirements shall apply to each portion of the building based on the occupancy classification of that accessory space, except that the most restrictive applicable provisions of Section 403 and Chapter 9 shall apply to the entire building or portion thereof." Traditionally, the exceptions have been employed to allow such buildings to have allowable areas based on the main occupancy of the building and to avoid occupancy separations. The reality is that each of these goals can be achieved using current provisions, without the exceptions. The key difference is that if there are any specific requirements that are normally associated with a given occupancy, they must be acknowledged. It was noted during discussion of the item in Orlando that although the provisions were removed from Section 508.3.1, they were not relocated in more appropriate sections. The modification reflected in this public comment corrects that valid observation. Exception 1 is almost moot inasmuch as the matter is already addressed at Section 303.1, Exception 3. Former Exceptions 2 and 3 have been relocated as Exceptions 4 and 5 to Section 303.1. The 2006 IBC accessory occupancy provisions clarify that they are intended only to define a mixed occupancy design option. They are not intended to relieve any pertinent code requirement. Approval of this proposal will clarify accessory occupancy provisions in the IBC and promote needed uniformity in the treatment of these important areas.

Final Hearing Results

G137-06/07

AMPC1

Code Change No: **G140-06/07**

Original Proposal

Sections: 508.3.1.3, 508.3.2.3

Proponents: George Thomas, PE, CBO, Pleasanton, CA, representing the California Fire Chiefs Association and Tri-Chapter Code Committee; Laura Blaul and Lorin Neyer, representing the California Fire Chief's Association

Revise as follows:

508.3.1.3 Separation. No separation is required between accessory occupancies or the main occupancy.

Exceptions:

1. Group H-2, H-3, H-4 or H-5 occupancies shall be separated from all other occupancies in accordance with Section 508.3.3.
2. Group R occupancies shall be separated from other accessory occupancies in accordance with Section 508.3.3.4.

508.3.2.3 Separation. No separation is required between occupancies.

Exceptions:

1. Group H-2, H-3, H-4 or H-5 occupancies shall be separated from all other occupancies in accordance with Section 508.3.3.
2. All Group R occupancies shall be separated from other occupancies in accordance with Section 508.3.3.4

Reason: The 2006 IBC, like the 2000 and 2003 editions, requires that a one-hour fire rated separation be provided between all dwelling units in Group R occupancies. Some interpret that since the code requires a separation between dwelling units it is logical that there also should be a one-hour separation between dwelling units and other use groups within the same building. The code however does not explicitly state that a fire rated separation between that portion of a building used for Group R and any other uses be provided except for Groups H2, H3, H4 and H5. Table 508.3.3 requires occupancy separations with one hour or more fire resistance to be located between Group R and all other occupancies. In multiple family dwellings, Section 419.3 requires that walls separating dwelling units must be constructed as fire partitions having a fire-resistance rating not less than 1-hour. It is logical that where dwelling units are located in mixed use buildings containing other occupancies that the occupancy separations required by Table 508.3.3 should not be eliminated through the use of the non-separated occupancy provisions of Section 508.3.2.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The additional separation requirements were not felt to be justified. In addition the separation being proposed is between Group R and accessory occupancies. This would not require separation from other more significant occupancies. These requirements would also make live/work arrangements more difficult.

Assembly Action:

None

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Frank Rainone, City of Sunnyvale, requests Approval as Submitted.

Commenter's Reason: Additional reasoning to support G 140, with the new exceptions to sections 508.3.1.3 and 508.3.2.3 are as follows; residential buildings already have the highest fire incidence, higher than any other occupancy and now would be subjected to even higher fire loading. Based on current code 508.3.1.3 and 508.3.2.3 these sections would allow the following occupancies B, F and M to have hazardous materials per tables 307.7 (1) and (2) with no separation to an, R occupancy. Introducing hazardous materials in these occupancies increases the fire loading of the whole building and subject the R occupancy to fire incidence which was not allowed by the previous edition of the IBC. The two exceptions should be included in the sections listed above. Due to the fact that section 419.3 already requires a separation between dwelling units, it would be justified to provide separations between occupancies with potential hazardous materials and all R occupancies, we disagree with the committee's action and wish to support G140 as submitted for approval.

Final Hearing Results

G140-06/07

AS

Code Change No: G142-06/07

Original Proposal

Section: 508.3.3.3

Proponent: Gregory R. Keith, Professional heuristic Development, representing the Boeing Company

Revise as follows:

508.3.3.3 Allowable height. Each occupancy shall comply with the height limitations based on the type of construction of the building in accordance with Section 503.1. ~~The height, in both feet and stories, of each fire area shall be measured from grade plane. This measurement shall include the height, in both feet and stories, of intervening fire areas.~~

Exception: Special provisions permitted by Section 509.

Reason: The stricken language was originally intended to modify the former (2003) separated use provisions. In the context of the new (2006) organization and format, the information is redundant. The basic provision of Section 508.3.3.3 requires the allowable height in feet and stories be determined in accordance with the fundamental provisions of Section 503.1. The concern of the stricken language is currently addressed in the definition of HEIGHT, BUILDING in Section 502.1. The additional language could confuse interpreters by indicating that the height requirements for separated occupancies are determined differently than for individual occupancies. It should be noted that the proposed language is identical to that approved by the membership in Detroit as a portion of the mixed occupancy and use reformatting exercise. Approval of this proposal will clarify the provisions for the determination of allowable height requirements in separated occupancies.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: This change removes provisions that were originally intended to work with the former (2003) separated occupancy requirements. Fire area is a separate concept from the separated occupancies in the 2006 IBC.

Assembly Action:

None

Final Hearing Results

G142-06/07

AS

Code Change No: **G145-06/07**

Original Proposal

Table 508.3.3

Proponents: Don Davies, Salt Lake City Corporation, representing the Utah Chapter; Stephen Thomas, City of Cherry Hills Village, representing the Colorado Chapter

Revise table as follows:

TABLE 508.3.3 REQUIRED SEPARATION OF OCCUPANCIES (HOURS)

(No changes to table text)

For SI: 1 square foot = 0.0929 m².

- S = Buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1.
 NS = Buildings not equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1.
 N = No separation requirement.
 NP = Not permitted.

- a. For Group H-5 occupancies, see Section 903.2.4.2.
~~b. Occupancy separation need not be provided for storage areas within Groups B and M if the:~~
~~1. Area is less than 10 percent of the floor area;~~
~~2. Area is equipped with an automatic fire extinguishing system and is less than 3,000 square feet; or~~
~~3. Area is less than 1,000 square feet.~~
~~c. b.~~ Areas used only for private or pleasure vehicles shall be allowed to reduce separation by 1 hour.
~~d. c.~~ See Section 406.1.4.
~~e. d.~~ Commercial kitchens need not be separated from the restaurant seating areas that they serve.

Reason: Don Davies. These special exceptions are a carryover from a legacy code prior to the creation of the nonseparated use provision in Section 508.3.2 and the incidental use Table 508.2. The separation or nonseparation of storage areas is better addressed under the provisions of the incidental use table where the separation is not required where a fire extinguishing system is provided. Where the building is not sprinkled then the provisions of a nonseparated use could be applied. Exception #2 is especially problematic in that it conflicts with the incidental use table which does not require the one-hour separation of storage areas when automatic fire-extinguishing system is provided. If a storage area exceeding 3,000 square feet is a problem to B and M occupancies then it should pose the same hazard to all occupancies. An additional conflict now occurs in the new occupancy separation table 508.3.3 which does not require any separation of storage areas "S" occupancy from "B" and "M" occupancies. As an exception to the table the exception which originally negated the requirement for a separation would now require the separation which makes no sense. In the context of the I.B.C. these provisions are no longer necessary.

Stephen Thomas. When this table was revised, the separation between a Group B or M occupancy and a Group S-1 occupancy was eliminated. However, footnote b was maintained. Based on this change, the footnote is no longer necessary since storage areas can be classified as a separate occupancy and are no longer required to be separated. Therefore, the footnote is not necessary.

Cost Impact: Don Davies. The code change proposal will not increase the cost of construction. On the surface it appears that the elimination of the exceptions would require the separations and impose a greater cost but since other provisions of the code already eliminate the separations there is no additional cost.

Stephen Thomas. The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The footnote is no longer required as the separation would not be required between Group B and M occupancies and the storage areas contained in these occupancies in Table 508.3.3. This issue would be better addressed simply through incidental and accessory requirements.

Assembly Action:

None

Final Hearing Results

G145-06/07

AS

Code Change No: **G149-06/07**

Original Proposal

Sections: 508.1 through 508.3.1.3

Proponent: Sarah A. Rice, Schirmer Engineering Corporation, Deerfield, IL

Revise as follows:

508.1 General. Each portion of a building shall be individually classified in accordance with Section 302.1. Where a building or portion thereof contains two or more occupancies or uses, the building or portion thereof shall comply with the applicable provisions of this section. Section 508.2, 508.3 or 508.4, or a combination of these sections.

Exceptions:

1. Occupancies separated in accordance with Section 509.
2. Where required by Table 415.3.2, areas of Group H-1, H-2 or H-3 occupancies shall be located in a separate and detached building or structure.

508.2 Ancillary use areas incidental uses. Ancillary use areas are those occupancies that are subordinate or auxiliary to the main occupancy of the building or portion thereof. Ancillary incidental use areas shall comply with the provisions of Section 508.2.1 through 508.2.6.3. this section.

Exceptions:

1. Ancillary incidental use areas within and serving a dwelling unit, are not required to comply with this section.
2. Accessory assembly areas having a floor area less than 750 square feet (69.7 m²) are not considered separate occupancies.
3. Accessory areas that are accessory to Group E occupancies are not considered separate occupancies except when applying the assembly occupancy requirements of Chapter 11.
4. Accessory religious educational rooms and religious auditoriums with occupant loads of less than 100 are not considered separate occupancies.

508.2.1 Area limitations. Ancillary use areas when measured aggregately, shall not occupy more than 10 percent of the area of the story in which they are located and shall not exceed the tabular values in Table 503, without area increases in accordance with Section 506 for the occupancy of the ancillary use or uses.

508.2.1 Occupancy classification. An incidental use area shall be classified in accordance with the occupancy of that portion of the building in which it is located or the building shall be classified as a mixed occupancy and shall comply with Section 508.3.

508.2.2 Occupancy classification. Ancillary use areas shall be individually classified in accordance with Section 302.1.

508.2.3 Applicability of other code requirements. Code requirements shall apply to each portion of the building based on the occupancy classification of that ancillary use area, except that the most restrictive applicable provisions of Section 403 and Chapter 9 shall apply to the entire building or portion thereof.

508.2.4 Allowable area and height. The allowable area and height of the building shall be based on the allowable area and height for the main occupancy in accordance with Section 503.1. The height of any ancillary use areas shall not exceed the tabular values in Table 503, without height increases in accordance with Section 504 for such ancillary occupancies. The area of the ancillary use area shall be in accordance with Section 508.2.1.

508.2.5 Separation of occupancies. Except where required by Section 508.2.6 the walls or floors separating ancillary use areas from other occupancies shall not be required to be fire-resistance rated.

Exception: Group H-2, H-3, H-4 or H-5 occupancies shall be separated from all other occupancies in accordance with Section 508.3.3.

508.2.2 508.2.6 Separation of ancillary use areas. Incidental use areas shall be separated or protected, or both, in accordance with Table 508.2. The ancillary use areas listed in Table 508.2.6 shall be physically separated from the remainder of the building or equipped with an automatic fire-extinguishing system, or both, in accordance with Table 508.2.

508.2.6.1 Fire resistance rated separation. 508.2.2.1 Construction. Where Table 508.2 requires a fire-resistance-rated separation, the incidental ancillary use area shall be separated from the remainder of the building by a fire barrier constructed in accordance with Section 706 or a horizontal assembly constructed in accordance with Section 711, or both.

508.2.6.2 Nonfire-resistance rated separation and protection. Where Table 508.2 permits an automatic fire-extinguishing system without a fire barrier, the incidental ancillary use area shall be separated from the remainder of the building by construction capable of resisting the passage of smoke. The ~~partitions~~ walls shall extend from the floor to the underside of the fire-resistance-rated floor/ceiling assembly or fire-resistance-rated roof/ceiling ceiling assembly above or to the underside of the floor or roof sheathing, or sub deck above. Doors shall be self- or automatic closing upon detection of smoke in accordance with Section 715.4.7.3. Doors shall not have air transfer openings and shall not be undercut in excess of the clearance permitted in accordance with NFPA 80.

TABLE 508.2 INCIDENTAL ANCILLARY USE AREAS

(No changes to current text)

508.2.3 508.2.6.3 Protection. Where an automatic fire-extinguishing system or an automatic sprinkler system is provided in accordance with Table 508.2, only the incidental use areas need be equipped with such a system.

508.3 Mixed occupancies. Each portion of a building shall be individually classified in accordance with Section 302.1. Where a building contains more than one occupancy group, the building or portion thereof shall comply with Sections 508.3.1, 508.3.2, 508.3.3 or a combination of these sections.

Exceptions:

- ~~1. Occupancies separated in accordance with Section 509.~~
- ~~2. Where required by Table 415.3.2, areas of Group H-1, H-2 or H-3 occupancies shall be located in a separate and detached building or structure.~~

508.3.1 Accessory occupancies. Accessory occupancies are those occupancies subsidiary to the main occupancy of the building or portion thereof. Aggregate accessory occupancies shall not occupy more than 10 percent of the area of the story in which they are located and shall not exceed the tabular values in Table 503, without height and area increases in accordance with Sections 504 and 506 for such accessory occupancies.

Exceptions:

- ~~1. Accessory assembly areas having a floor area less than 750 square feet (69.7 m²) are not considered separate occupancies.~~
- ~~2. Assembly areas that are accessory to Group E occupancies are not considered separate occupancies except when applying the assembly occupancy requirements of Chapter 11.~~
- ~~3. Accessory religious educational rooms and religious auditoriums with occupant loads of less than 100 are not considered separate occupancies.~~

~~**508.3.1.1 Occupancy classification.** Accessory occupancies shall be individually classified in accordance with Section 302.1. Code requirements shall apply to each portion of the building based on the occupancy classification of that accessory space, except that the most restrictive applicable provisions of Section 403 and Chapter 9 shall apply to the entire building or portion thereof.~~

~~**508.3.1.2 Allowable area and height.** The allowable area and height of the building shall be based on the allowable area and height for the main occupancy in accordance with Section 503.1. The height of any accessory occupancy shall not exceed the tabular values in Table 503, without height and area increases in accordance with Sections 504 and 506 for such accessory occupancies.~~

~~**508.3.1.3 Separation.** No separation is required between accessory occupancies or the main occupancy.~~

~~**Exception:** Group H-2, H-3, H-4 or H-5 occupancies shall be separated from all other occupancies in accordance with Section 508.3.3.~~

(Renumber subsequent sections)

Reason: There has always been confusion when it comes to determining when a building has mixed occupancies, and if it does what level of protection and/or separation is required, and how ““accessory use areas”” and ““incidental use areas”” are related.

The changes made to Section 302 last cycle made it clear that both accessory use areas and incidental use areas are subsets of a mixed occupancy building, but that really was a beginning of what is needed to make Section 302 ““user friendly.””. This proposal seeks to go to the next level and

- Organize Section 302.3 to be more user-friendly, and
- Make it clear that “incidental use areas” are really only “accessory use areas” that require special protection.

To begin with, the use of two terms to define different aspects (or levels) of the same concept have been the source of confusion. Therefore, to make this cleaner and hopefully add clarity to the entire concept of mixed occupancies, it is proposed that both the term “accessory use area” and “incidental use area” be replaced with a new term - “ancillary use area.” Then the provisions that were attached to each of these organized such that those provisions previously called “incidental use area” are now considered as “ancillary use area” but have special protection and/or separation provisions.

In addition, the text has been arranged such that when a building contains small areas occupied by an occupancy(s) that is different than that of the main occupancy, depending upon the risk of that “ancillary” occupancy it may or may not need to be separated from the main occupancy.

The proposed change is intended to clearly establish the hierarchy of the options available to a designer when a building contains mixed occupancies.

As the designer is fundamentally given the choice of which option they wish to apply when designing a building having mixed occupancies, the proposed code change arranges the code provisions in the order in which most designers are going to look at a mixed occupancy scenario. The order would be:

- 1) identify all of the occupancies in the building (regardless of the amount of area they occupy),
- 2) see if the area occupied by any one occupancy or multiple occupancies,
 - a) occupies < 10% of the aggregate floor area, or
 - b) exceeds the tabular values for either height or area for such occupancy.
- 3) if the occupancy(s) does occupy < 10% of the aggregate floor area nor exceed the tabular values for either height or area for such occupancy. or so, then it is an ““ancillary use area”” and Section 508.2 applies. If an “ancillary use area,” it becomes clear that there are certain cases where it must be separated/protected - Table 508.2
- 4) If > 10% then it is not an ““ancillary use area”” and must comply with either a non separated occupancy or a separated occupancy.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: Disapproved with concern that it will undo provisions that were recently implemented into the 2006 code. The incidental use area concept will be lost by this proposal. Suggest a more thorough review of the subject to see how it will affect the new provisions.

Assembly Action:

None

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Sarah A. Rice, Schirmer Engineering Corporation, Deerfield, IL and Gregory R. Keith, Professional heuristic Development representing the Boeing Company requests Approval as Modified by this public comment.

Modify proposal as follows:

508.1 General. Each portion of a building shall be individually classified in accordance with Section 302.1. Where a building contains more than one occupancy group or portion thereof contains two or more occupancies or uses, the building or portion thereof shall comply with the applicable provisions of Section 508.2, 508.3 or 508.4, or a combination of these sections.

Exceptions:

1. Occupancies separated in accordance with Section 509.
2. Where required by Table 415.3.2, areas of Group H-1, H-2 or H-3 occupancies shall be located in a separate and detached building or structure.

508.2 Accessory occupancies ~~Ancillary use areas~~ ~~Ancillary use areas~~ Accessory occupancies are those occupancies that are ancillary subordinate or auxiliary to the main occupancy of the building or portion thereof. ~~Ancillary use areas~~ Accessory occupancies shall comply with the provisions of Section 508.2.1 through 508.2.6.3.

Exceptions:

- ~~1. Ancillary use areas within and serving a dwelling unit, are not required to comply with this section.~~
- ~~1.~~ ~~2.~~ Accessory assembly areas having a floor area less than 750 square feet (69.7 m²) are not considered separate occupancies.
- ~~2.~~ ~~3.~~ Assembly areas that are accessory to Group E occupancies are not considered separate occupancies except when applying the assembly occupancy requirements of Chapter 11.
- ~~3.~~ ~~4.~~ Accessory religious educational rooms and religious auditoriums with occupant loads of less than 100 are not considered separate occupancies.

508.2.1 Area limitations. ~~Ancillary use areas when measured aggregately.~~ Aggregate accessory occupancies shall not occupy more than 10 percent of the area of the story in which they are located and shall not exceed the tabular values in Table 503, without area increases in accordance with Section 506 for such accessory occupancies ~~the occupancy of the ancillary use or uses.~~

508.2.2 Occupancy classification. ~~Ancillary use areas~~ Accessory occupancies shall be individually classified in accordance with Section 302.1.

508.2.3 Applicability of other code requirements. Code requirements shall apply to each portion of the building based on the occupancy classification of that space ~~Ancillary use areas~~, except that the most restrictive applicable provisions of Section 403 and Chapter 9 shall apply to the entire building or portion thereof.

508.2.3 508.2.4 Allowable area and height. The allowable area and height of the building shall be based on the allowable area and height for the main occupancy in accordance with Section 503.1. The height of any ~~ancillary use areas~~ accessory occupancies shall not exceed the tabular values in Table 503, without height increases in accordance with Section 504 for such ancillary accessory occupancies. The area of the ~~ancillary use areas~~ accessory occupancies shall be in accordance with Section 508.2.1

508.2.4 508.2.5 Separation of occupancies. ~~No separation is required between accessory occupancies or the main occupancy. Except where required by Section 508.2.6, the walls or floors separating ancillary use areas from other occupancies shall not be required to be fire-resistance rated.~~

Exceptions:

- ~~1.~~ Group H-2, H-3, H-4 or H-5 occupancies shall be separated from all other occupancies in accordance with Section 508.4 ~~3.3.~~
- ~~2.~~ Incidental accessory occupancies required to be separated or protected by Section 508.2.5.

508.2.5 508.2.6 Separation of incidental accessory occupancies ~~ancillary use areas~~. The ~~ancillary use areas~~ incidental accessory occupancies listed in Table 508.2.5 shall be physically separated from the remainder of the building or equipped with an automatic fire-extinguishing system, or both, in accordance with Table 508.2.5.

Exception: Incidental accessory use areas within and serving a dwelling unit are not required to comply with this section.

508.2.5.1 508.2.6.1 Fire resistance rated separation. Where Table 508.2.5 requires a fire-resistance rated separation, the ~~ancillary use areas~~ incidental accessory occupancies shall be separated from the remainder of the building by a fire barrier constructed in accordance with Section 706 or a horizontal assembly constructed in accordance with Section 711, or both.

508.2.5.2 508.2.6.2 Nonfire-resistance rated separation and protection. Where Table 508.2.5 permits an automatic fire extinguishing system without a fire barrier, the ~~ancillary use areas~~ incidental accessory occupancies shall be separated from the remainder of the building by construction capable of resisting the passage of smoke. The walls shall extend from the floor to the underside of the fire-resistance-rated floor/ceiling assembly or fire-resistance-rated roof/ceiling assembly above or to the underside of the floor or roof sheathing, or sub deck above. Doors shall be self- or automatic closing upon detection of smoke in accordance with Section 715.4.7.3. Doors shall not have air transfer openings and shall not be undercut in excess of the clearance permitted in accordance with NFPA 80.

508.2.5.3 508.2.6.3 Protection. Where an automatic fire-extinguishing system or an automatic sprinkler system is provided in accordance with Table 508.2.5, only the ~~incidental use area~~ space occupied by the incidental accessory occupancy need be equipped with such a system.

TABLE 508.2.5

Incidental Accessory Occupancies ~~Ancillary-Use Areas~~ (No changes to current text of table)

508.3 508.3.2 Nonseparated occupancies. [No changes to current text but section renumbered accordingly]

508.4 508.3.3 Separated occupancies. [No changes to current text but section renumbered accordingly]

Commenter's Reason: The language proposed above is a result of a collaborative effort of the co-proponents. What is proposed is intended to achieve the intent of the original proposal and resolve the concerns expressed at the hearings regarding the potential adverse affect on the new format of Section 508. This proposal does the following:

- It relocates the content of current Section 508.2; Incidental Use Areas to be part of the mixed use provisions in Section 508.3; Mixed occupancies. More specifically, this proposal relocates the text currently found in Section 508.2 and moves it into current Section 508.3.1 so as to become a subset of the accessory occupancy provisions.
- It fundamentally maintains the terminology currently found in Section 508 (e.g., accessory occupancy and incidental use areas) – with the exception that what were called “incidental use areas” are now called “incidental accessory occupancies.” The terminology change is consistent with the concept that “incidental use areas” are a subset of “accessory occupancies.”
- By “incidental use areas” becoming a subset of “accessory occupancies” it is clear that there is a maximum area limit to those occupancies that are considered currently to be “incidental use areas” - 10% - same as “accessory use areas.”
- The proposed language maintains the format of Section 508
- The language found in current Section 508.3 which gives direction on how the mixed occupancies provisions are to be used has been relocated to be part of the general statement in 508.1.

Final Hearing Results

G149-06/07

AMPC1

Code Change No: G151-06/07

Original Proposal

Section: 509.1

Proponent: John Berry, Cole + Russell Architects, Inc., Cincinnati, OH

Revise as follows:

509.1 General. The provisions in this section shall permit the use of special conditions that are exempt from, or modify, the specific requirements of this chapter regarding the allowable heights and areas of buildings based on the occupancy classification and type of construction, provided the special condition complies with the provisions specified in this section for such condition and other applicable requirements of this code. The provisions of Sections 509.2 through 509.8 are to be considered independent and separate from each other.

Reason: Section 509 is an unusual section that allows special provisions in unique and limited situations. A common point of confusion w/ many code users is assuming that all options allowed in Section 509 are actually required to be met at the same time. This is not the intent of Section 509. Each section within Section 509 is to be considered and applied to a building based upon the specific requirements/allowances specified solely within the specific section. Adding the proposed sentence will clarify the proper application of Section 509.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The proposal clarifies that each of the sections within 509 are independent from one another and should be applied independently.

Assembly Action:

None

Final Hearing Results

G151-06/07

AS

Code Change No: **G153-06/07**

Original Proposal

Sections: 509.2, 509.3

Proponent: Philip Brazil, PE, Reid Middleton, Inc., Everett, WA, representing himself

509.2 Group S-2 enclosed or open parking garage with Group A, B, M, R or S above. A ~~basement and/or the first story above grade plane of a building~~ shall be considered as a two separate and distinct buildings for the purpose of determining area limitations, continuity of fire walls, limitation of number of stories and type of construction ~~when~~ where all of the following conditions are met:

1. ~~The basement and/or the first story above grade plane is of Type IA construction and is separated from the buildings are separated above~~ with a horizontal assembly having a minimum 3-hour fire-resistance rating.
2. The building below the horizontal assembly is no more than one story above grade plane.
3. The building below the horizontal assembly is of Type IA construction.
4. Shaft, stairway, ramp ~~or~~ and escalator enclosures through the horizontal assembly shall have not less than a 2-hour fire-resistance rating with opening protectives in accordance with Table 715.4.

Exception: Where the enclosure walls below the horizontal assembly have not less than a 3-hour fire-resistance rating with opening protectives in accordance with Table 715.4, the enclosure walls extending above the horizontal assembly shall be permitted to have a 1-hour fire-resistance rating, provided:

1. The building above the horizontal assembly is not required to be of Type I construction;
 2. The enclosure connects less than four stories; and
 3. The enclosure opening protectives above the horizontal assembly have a minimum 1-hour fire protection rating.
- ~~3.5.~~ The building above the horizontal assembly shall be permitted to have multiple Group A uses, each with an occupant load of less than 300, or Group B, M, R or S uses.
- ~~4.6.~~ The building below the horizontal assembly is a Group S-2 enclosed or open parking garage, used for the parking and storage of private motor vehicles.

Exceptions:

1. Entry lobbies, mechanical rooms and similar uses incidental to the operation of the building shall be permitted.
 2. Multiple Group A uses, each with an occupant load of less than 300, or Group B or M uses shall be permitted, in addition to those uses incidental to the operation of the building (including storage areas), provided that the entire structure below the horizontal assembly is protected throughout by an approved automatic sprinkler system.
- ~~5.7.~~ The maximum building height in feet shall not exceed the limits set forth in Section 503 for the building having the smaller allowable height as measured from the grade plane.

509.3 Group S-2 enclosed parking garage with Group S-2 open parking garage above. A Group S-2 enclosed parking garage with no more than one story above grade plane and located ~~in the basement or first story~~ below a Group S-2 open parking garage shall be classified as a separate and distinct building for the purpose of determining the type of construction ~~when~~ where the following conditions are met:

1. The allowable area of the ~~structure~~ building shall be such that the sum of the ratios of the actual area divided by the allowable area for each separate occupancy shall not exceed 1.0.
2. The Group S-2 enclosed parking garage is of Type I or II construction and is at least equal to the fire-resistance requirements of the Group S-2 open parking garage.

3. The height and the number of ~~the floors above the basement~~ tiers of the Group S-2 open parking garage shall be limited as specified in Table 406.3.5.
4. The floor assembly separating the Group S-2 enclosed parking garage and Group S-2 open parking garage shall be protected as required for the floor assembly of the Group S-2 enclosed parking garage. Openings between the Group S-2 enclosed parking garage and Group S-2 open parking garage, except exit openings, shall not be required to be protected.
5. The Group S-2 enclosed parking garage is used exclusively for the parking or storage of private motor vehicles, but shall be permitted to contain an office, waiting room and toilet room having a total area of not more than 1,000 square feet (93 m²), and mechanical equipment rooms incidental to the operation of the building.

Reason: The purpose of this proposal is to clarify the methods used in Sections 509.2 and 509.3 to establish the equivalent of separate and distinct buildings. Currently, Section 509.2 permits a basement and/or a first story above grade plane, and Section 509.3 permits a Group S-2 enclosed parking garage located in a basement and/or first story below a Group S-2 open parking garage, to be considered a separate and distinct building if certain conditions are met. The height of the first story above grade plane is well established elsewhere in Chapter 5 but that of a basement is not. The question of whether the term “basement” applies to each floor level that is partly or completely below grade or to all floor levels that are partly or completely below grade is addressed by a related code change proposal. Assuming that the term “basement” applies to each floor level that is partly or completely below grade, it is conceivable that more than one basement could qualify as a story above grade plane. The definition of basement in Section 502.1 establishes when a basement is considered a story above grade plane but there is no restriction in the definition or elsewhere in the IBC limiting such a basement to no higher than the first (one) story above grade plane.

Once the location of the basement and/or a first story above grade plane is established, what about the floor levels below the basement and/or a first story above grade plane? Literally, they are currently excluded from the separate and distinct building below the fire-resistance-rated horizontal assembly, which is required between the upper and lower buildings in both cases. The proposed revision establishes a criterion in each case that is more precise and closer to the intent, which is to consider a portion of a building whose topmost floor is no higher than the first story above grade plane to be a separate and distinct building.

The proposed change from “floors” to “tiers” in Item 3 of Section 508.3 is for consistency with the use of “tier” for open parking garages in Section 406.3. “Structure” is revised to “building” in Item #1 of Section 509.3 for consistency with use of the term “building” in the charging statement of Section 509.3.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: Based upon the request of the proponent.

Assembly Action:

None

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Philip Brazil, PE, Reid Middleton, Inc., Everett, WA, representing himself, requests Approval as Modified by this public comment.

Modify proposal as follows:

509.2 Group S-2 enclosed or open parking garage with Group A, B, M, R or S above. A building shall be considered as ~~two~~ separate and distinct buildings for the purpose of determining area limitations, continuity of fire walls, limitation of number of stories and type of construction where all of the following conditions are met:

1. The buildings are separated with a horizontal assembly having a minimum 3-hour fire-resistance rating.
2. The building below the horizontal assembly is no more than one story above grade plane.
3. The building below the horizontal assembly is of Type IA construction.
4. Shaft, stairway, ramp and escalator enclosures through the horizontal assembly shall have not less than a 2-hour fire-resistance rating with opening protectives in accordance with Table 715.4.

Exception: Where the enclosure walls below the horizontal assembly have not less than a 3-hour fire-resistance rating with opening protectives in accordance with Table 715.4, the enclosure walls extending above the horizontal assembly shall be permitted to have a 1-hour fire-resistance rating, provided:

1. The building above the horizontal assembly is not required to be of Type I construction;
 2. The enclosure connects less than four stories; and
 3. The enclosure opening protectives above the horizontal assembly have a minimum 1-hour fire protection rating.
5. The building or buildings above the horizontal assembly shall be permitted to have multiple Group A uses, each with an occupant load of less than 300, or Group B, M, R or S uses.
 6. The building below the horizontal assembly is a Group S-2 enclosed or open parking garage, used for the parking and storage of private motor vehicles.

Exceptions:

1. Entry lobbies, mechanical rooms and similar uses incidental to the operation of the building shall be permitted.
 2. Multiple Group A uses, each with an occupant load of less than 300, or Group B or M uses shall be permitted, in addition to those uses incidental to the operation of the building (including storage areas), provided that the entire structure below the horizontal assembly is protected throughout by an approved automatic sprinkler system.
7. The maximum building height in feet shall not exceed the limits set forth in Section 503 for the building having the smaller allowable height as measured from the grade plane.

(Portions of the proposal not shown remain unchanged)

Commenter's Reason: The purpose for this public comment is to eliminate an unintended consequence of the originally proposed revisions. Section 509.2, as originally proposed for revision, could be interpreted as limiting the portion of the building above the horizontal assembly to one building. The current language of Section 509.2 does not intend to limit that portion of the building in such a manner and I did not intend to change that in the proposal. As currently intended and as intended by the revised proposal in this public comment, the portion of the building above the horizontal assembly could consist of more than building. Note that this unintended consequence exists with the current language unaffected by the original proposal. In Item #5 of Section 509.2, "building above the horizontal assembly" is changed to "buildings above the horizontal assembly."

Final Hearing Results

G153-06/07

AMPC1

Code Change No: G154-06/07

Original Proposal

Section: 509.2

Proponent: Marshall A. Klein, P.E., Marshall A. Klein and Associates, Inc., representing the Erickson Retirement Communities

Revise as follows:

509.2 Group S-2 enclosed or open parking garage with Group A, B, M, R or S above. A basement and/or the first story above grade plane of a building shall be considered as a separate and distinct building for the purpose of determining area limitations, continuity of fire walls, limitation of number of stories and type of construction when all of the following conditions are met:

1. The basement and/or the first story above grade plane is of Type IA construction and is separated from the building above with a horizontal assembly having a minimum 3-hour fire-resistance rating.
2. Shaft, stairway, ramp or escalator enclosures through the horizontal assembly shall have not less than a 2-hour fire-resistance rating with opening protectives in accordance with Table 715.4.

Exception: Where the enclosure walls below the horizontal assembly have not less than a 3-hour fire-resistance rating with opening protectives in accordance with Table 715.4, the enclosure walls extending above the horizontal assembly shall be permitted to have a 1-hour fire-resistance rating, provided:

1. The building above the horizontal assembly is not required to be of Type I construction;

2. The enclosure connects less than four stories; and
 3. The enclosure opening protectives above the horizontal assembly have a minimum 1-hour fire protection rating.
3. The building above the horizontal assembly shall be permitted to have multiple Group A uses, each with an occupant load of less than 300, or Group B, M, R or S uses.
 4. The building below the horizontal assembly is a Group S-2 enclosed or open parking garage, used for the parking and storage of private motor vehicles.

Exceptions:

1. Entry lobbies, mechanical rooms and similar uses incidental to the operation of the building shall be permitted.
 2. Multiple Group A uses, each with an occupant load of less than 300, or Group B or M, or R uses shall be permitted, in addition to those uses incidental to the operation of the building (including storage areas), provided that the entire structure below the horizontal assembly is protected throughout by an approved automatic sprinkler system.
5. The maximum building height in feet shall not exceed the limits set forth in Section 503 for the building having the smaller allowable height as measured from the grade plane.

Reason: Section 509.2(4) Exception #2 is being proposed to be updated to include the R-use **below** the 3-hour horizontal separation, as is already permitted by Section 508.2(3) for uses **above** the 3-hour horizontal separation.

This section's code requirements were originally from the UBC (Section 702(a)). This section was created to address mixed use construction buildings in urban areas where many cities were trying to promote mixed-use neighborhoods. The concept of these code requirements for "pedestal" buildings was a cost-effective way of allowing housing to be provided in commercial areas without jeopardizing the safety of residents. Since its placement in the UBC, and now under the IBC, it has been used to revitalize urban areas by bringing people back into the cities to live and work.

In the past few years, many projects have been proposed to use work/live units or additional dwelling units on the first floor of mixed-use buildings built under the special requirements of Section 509.2. From a fire protection/life safety standpoint, placing an R use on the first floor, below the 3-hour horizontal separation is not an issue. After all, the entire structure below the 3-hour horizontal separation is already required to be Type 1A (the highest fire resistive construction type in the Code), and is required to be protected throughout by an approved automatic sprinkler system. However, the literal text of the Exception #2 does not address an R use, which is what work/live units would also fall under.

Therefore, this code proposal would address the uses below the 3-hour horizontal separation to be consistent with the same uses above the 3-hour horizontal separation.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The proposal was approved as submitted as it would assist efforts to revitalize urban areas without any increase in hazard. In fact the proposal may increase occupant safety by potentially locating residential occupancies closer to the level of exit discharge.

Assembly Action:

None

Final Hearing Results

G154-06/07

AS

Code Change No: **G155-06/07**

Original Proposal

Section: 509.2

Proponent: Marshall A. Klein, P.E., Marshall A. Klein and Associates, Inc.

Revise as follows:

509.2 Group S-2 enclosed or open parking garage with Group A, B, M, R or S above. A basement and/or the first story above grade plane of a building shall be considered as a separate and distinct building for the purpose of determining area limitations, continuity of fire walls, limitation of number of stories and type of construction when all of the following conditions are met:

1. The basement and/or the first story above grade plane is of Type IA construction and is separated from the building above with a horizontal assembly having a minimum 3-hour fire-resistance rating.
2. Shaft, stairway, ramp or escalator enclosures through the horizontal assembly shall have not less than a 2-hour fire-resistance rating with opening protectives in accordance with Table 715.4.

Exception: Where the enclosure walls below the horizontal assembly have not less than a 3-hour fire-resistance rating with opening protectives in accordance with Table 715.4, the enclosure walls extending above the horizontal assembly shall be permitted to have a 1-hour fire-resistance rating, provided:

1. The building above the horizontal assembly is not required to be of Type I construction;
2. The enclosure connects less than four stories; and
3. The enclosure opening protectives above the horizontal assembly have a minimum 1-hour fire protection rating.
3. The building above the horizontal assembly shall be permitted to have multiple Group A uses, each with an occupant load of less than 300, or Group B, M, R or S uses.
4. The building below the horizontal assembly ~~is shall be permitted to be~~ a Group S-2 enclosed or open parking garage; ~~used for the parking and storage of private motor vehicles.~~

Exceptions:

1. ~~Entry lobbies, mechanical rooms and similar uses incidental to the operation of the building shall be permitted.~~
2. Multiple Group A uses, each with an occupant load of less than 300; ~~or~~ Group B or M uses shall be permitted, in addition to those uses incidental to the operation of the building (including entry lobbies, mechanical rooms, storage areas, and similar uses), provided that the entire structure below the horizontal assembly is protected throughout by an approved automatic sprinkler system.
5. The maximum building height in feet shall not exceed the limits set forth in Section 503 for the building having the smaller allowable height as measured from the grade plane.

Reason: Revisions are intended to be only editorial to make the use and intent of this section of the Code clearer to the user.

The exceptions really are not exceptions, but additional uses permitted below the 3-hour horizontal separation from the building above the 3-hour horizontal separation. Since this section on "pedestal" buildings was from one of the legacy codes (UBC), users of the other two legacy codes (BOCA & SBC) have had problems understanding the intent and application of this section's exceptions. The rewording as proposed will help clear up any confusion on properly applying which uses in the IBC are permitted below the 3-hour horizontal separation.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Modified

Replace proposal as follows:

509.2 Horizontal building separation allowance. A basement and/or the first story above grade plane of a building shall be considered as a separate and distinct building for the purpose of determining area limitations, continuity of fire walls, limitation of number of stories and type of construction when all of the following conditions are met:

1. The basement and/or the first story above grade plane is of Type IA construction and is separated from the building above with a horizontal assembly having a minimum 3-hour fire-resistance rating.
2. Shaft, stairway, ramp or escalator enclosures through the horizontal assembly shall have not less than a 2-hour fire-resistance rating with opening protectives in accordance with Table 715.4.

Exception: Where the enclosure walls below the horizontal assembly have not less than a 3-hour fire-resistance rating with opening protectives in accordance with Table 715.4, the enclosure walls extending above the horizontal assembly shall be permitted to have a 1-hour fire-resistance rating, provided:

1. The building above the horizontal assembly is not required to be of Type I construction;
 2. The enclosure connects less than four stories; and
 3. The enclosure opening protectives above the horizontal assembly have a minimum 1-hour fire protection rating.
3. The building above the horizontal assembly shall be permitted to have multiple Group A uses, each with an occupant load of less than 300, or Group B, M, R or S uses.
 4. The building below the horizontal assembly ~~is~~ shall be protected throughout by an approved automatic sprinkler system in accordance with Section 903.3.1.1, and shall be permitted to be any of the following occupancies:

~~1.-a~~ Group S-2 enclosed or open parking garage used for the parking and storage of private motor vehicles. ~~1~~

Exceptions:

- ~~1. Entry lobbies, mechanical rooms and similar uses incidental to the operation of the building shall be permitted.~~
 - ~~2. Multiple Group A uses, each with an occupant load of less than 300; or~~
 - ~~3. Group B or~~
 - ~~4. Group M, and uses shall be permitted, in addition to those~~
 - ~~5. Uses incidental to the operation of the building (including entry lobbies, mechanical rooms, storage areas, and similar uses), provided that the entire structure below the horizontal assembly is protected throughout by an approved automatic sprinkler system.~~
5. The maximum building height in feet shall not exceed the limits set forth in Section 503 for the building having the smaller allowable height as measured from the grade plane.

Committee Reason: Does not change the intent of the section but clarifies that any of the occupancies listed would be allowed regardless of whether or not a Group S-2 parking garage was located in that portion of the building. The modification simply clarified the allowance with the creation of a numbered list. In order to make a numbered list the sprinkler requirements needed to be moved to the main body of item 4.

Analysis: Note that the section title has been revised by staff to coordinate better with the content of the section. Section titles are editorial.

Assembly Action:

None

Final Hearing Results

G155-06/07

AM

Code Change No: G156-06/07

Original Proposal

Sections: 509.5, 509.6

Proponent: Roger R. Evans, Park City Municipal Corporation, representing the Utah Chapter

Revise as follows:

509.5 Group R-2 buildings of Type IIIA construction. The height limitation for buildings of Type IIIA construction in Group R-2 shall be increased to six stories and 75 feet (22 860 mm) where the first-floor construction above the basement has a fire-resistance rating of not less than 3 hours and the floor area is subdivided by 2-hour fire-resistance-rated fire walls into areas of not more than 3,000 square feet (279 m²).

509.6 Group R-2 buildings of Type IIA construction. The height limitation for buildings of Type IIA construction in Group R-2 shall be increased to nine stories and 100 feet (30 480 mm) where the building is separated by not less than 50 feet (15 240 mm) from any other building on the lot and from lot lines, the exits are segregated in an area enclosed by a 2-hour fire-resistance-rated fire wall and the first-floor construction has a fire-resistance rating of not less than 1½ hours.

Reason: When you compare the differences between Group R-1 occupancies and Group R-2 occupancies and look at the fire record information that is published by NFPA, there is no justifiable reason not to extend the special provisions of Section 509 to Group R-1 occupancies.

Cost Impact: The code change proposal will decrease the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: Since fire losses in Group R-1 occupancies have been minimal they should be given the same height increase allowances as Group R-2 as addressed in Sections 509.5 and 509.6.

Assembly Action:

None

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

William Michael Brady, Ohio Board of Building Standards, representing himself, requests Approval as Modified by this public comment.

Further modify proposal as follows:

509.5 Group R1 and R-2 buildings of Type IIIA construction. The height limitation for buildings of Type IIIA construction in Groups R1 and R-2 shall be increased to six stories and 75 feet (22 860 mm) where the first-floor construction above the basement has a fire-resistance rating of not less than 3 hours and the floor area is subdivided by 2-hour fire resistance-rated fire walls into areas of not more than 3,000 square feet (279 m2).

509.6 Groups R1 and R-2 buildings of Type IIA construction. The height limitation for buildings of Type IIA construction in Groups R1 and R-2 shall be increased to nine stories and 100 feet (30 480 mm) where the building is separated by not less than 50 feet (15 240 mm) from any other building on the lot and from lot lines, the exits are segregated in an area enclosed by a 2-hour fire-resistance-rated fire wall and the first-floor construction has a fire-resistance rating of not less than 1½ hours.

Commenter's Reason: The proponent's reasoning statement and the committee's reason for approving the proposal was based on including R-1 occupancies into section 509.5 and 509.6. The proponent's language, however, inadvertently covered all R occupancies including R-3 and R-4 (assisted living facilities) with no justification. The proposed change returns the text to the proponent's original intent.

Final Hearing Results

G156-06/07

AMPC1

Code Change No: **G157-06/07**

Original Proposal

Section: 509.8

Proponent: Philip Brazil, PE, Reid Middleton, Inc., representing himself
Revise as follows:

509.8 Group B or M with Group S-2 open parking garage above. ~~Group B or M uses located in the basement or first story below a Group S-2 open parking garage~~ A building shall be classified considered as a two separate and distinct building for the purpose of determining the type of construction when where all of the following conditions are met:

- ~~1. The basement or first story shall be Type I or II construction, but not less than the type of construction required for the open parking garage above. The height and area of the basement or first story shall not exceed the limitations in Section 503 for the Group B or M uses.~~
 - ~~2. The height and area of the open parking garage shall not exceed the limitations permitted under Section 406.3. The height, in both feet and stories, of the open parking garage shall be measured from grade plane and include both the open parking garage and the basement or first story.~~
 - ~~3. Fire separation assemblies between the open parking garage and the basement or first story use group shall correspond to the required fire-resistance rating prescribed by Table 508.3.3~~
 - ~~4. Exits serving the open parking garage shall discharge directly to a street or public way and shall be separated from the basement or first story use group by not less than 2-hour fire barriers constructed in accordance with Section 706 or 2-hour horizontal assemblies constructed in accordance with Section 711, or both, with opening protectives in accordance with Table 715.4.~~
1. The buildings are separated with a horizontal assembly having a minimum 2-hour fire-resistance rating.
 2. The occupancies in the building below the horizontal assembly are limited to Groups B and M.
 3. The building above the horizontal assembly is a Group S-2 open parking garage.
 4. The building below the horizontal assembly is no more than one story above grade plane.
 5. The building below the horizontal assembly is of Type I or II construction but not less than the type of construction required for the Group S-2 open parking garage above.
 6. The height and area of the building below the horizontal assembly does not exceed the limits set forth in Section 503.
 7. The height and area of the Group S-2 open parking garage does not exceed the limits set forth in Section 406.3. The height, in both feet and stories, of the open parking garage shall be measured from grade plane and shall include the building below the horizontal assembly.
 8. Exits serving the Group S-2 open parking garage discharge directly to a street or public way and are separated from the building below the horizontal assembly by 2-hour fire barriers constructed in accordance with Section 706 or 2-hour horizontal assemblies constructed in accordance with Section 711, or both.

Reason: The purpose of this proposal is to update the provisions for consistency with other related provisions in the code and to make them more understandable to the average code user. Item #3 currently refers to fire separation assemblies, which is the only instance in the IBC of the term. A fire-resistance-rated horizontal assembly is the likely intent. Section 711 on horizontal assemblies specifies technical provisions for horizontal assemblies ensuring horizontal compartmentation through fire-resistance of the assembly and the protection of penetrations and openings equivalent to a fire-resistance rating. There are no technical provisions in the IBC, however, for fire separation assemblies. Item #3 also refers to use groups but this term was effectively eliminated from the IBC by code change proposal G14-04/05.

Item #1 permits Group B or M occupancies in a basement or first story below a Group S-2 open parking garage to be considered a separate and distinct building if certain conditions are met. A story is defined in Section 502.1 as a “portion of a building included between the upper surface of a floor and the upper surface of the floor or roof next above.” Consequently, stories are established between all adjoining floors including basement floors. In a building with several floors below grade, the first story is located between the bottom two floors. A story no higher than the first story above grade plane is the likely intent.

The height of the first story above grade plane is well established elsewhere in Chapter 5 but that of a basement is not. The question of whether the term “basement” applies to each floor level that is partly or completely below grade or to all floor levels that are partly or completely below grade is addressed by a related code change proposal. Assuming that the term “basement” applies to each floor level that is partly or completely below grade, it is conceivable that more than one basement could qualify as a story above grade plane. The definition of basement in Section 502.1 establishes when a basement is considered a story above grade plane but there is no restriction in the definition or elsewhere in the IBC limiting such a basement to no higher than the first (one) story above grade plane.

Once the location of the basement or first story above grade plane is established, what about the floor levels below the basement or a first story above grade plane? Literally, they are currently excluded from the separate and distinct building below the fire-resistance-rated horizontal assembly. The proposed revision establishes a criterion that is more precise and closer to the intent, which is to consider a portion of a building whose topmost floor is no higher than the first story above grade plane to be a separate and distinct building.

Items #2, #3 and #4 of the proposal correspond to the current charging language. Items #5 and #6 of the proposal correspond to current Item #1. Item #7 of the proposal corresponds to current Item #2. Item #1 of the proposal corresponds to current Item #3. Item #8 of the proposal corresponds to current Item #4.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: Based upon proponents request. The proponent plans to submit a public comment.

Assembly Action:

None

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Philip Brazil, PE, Reid Middleton, Inc., representing himself requests, Approval as Modified by this public comment.

Replace the proposal with the following:

509.8 Group B or M with Group S-2 open parking garage below. Group B or M uses occupancies located in the basement or first story below a Group S-2 open parking garage no higher than the first story above grade plane shall be ~~classified~~ considered as a separate and distinct building for the purpose of determining the type of construction ~~when~~ where all of the following conditions are met:

1. ~~The basement or first story shall be Type I or Type II construction, but not less than the type of construction required for the open parking garage above. The height and area of the basement or first story shall not exceed the limitations in Section 503 for the B or M uses.~~
 2. ~~The height and area of the open parking garage shall not exceed the limitations permitted under Section 406.3. The height, in both feet and stories, of the open parking garage shall be measured from grade plane and include both the open parking garage and the basement or first story.~~
 3. ~~Fire separation assemblies between the open parking garage and the basement or first story use group shall correspond to the required fire resistance rating prescribed by Table 508.3.3.~~
 4. ~~Exits serving the open parking garage shall discharge directly to a street or public way and shall be separated from the basement or first story use group by 2-hour fire barriers constructed in accordance with Section 706 or 2-hour horizontal assemblies constructed in accordance with Section 711, or both, with opening protectives in accordance with Section 715.4.~~
1. The buildings are separated with a horizontal assembly having a minimum 2-hour fire-resistance rating.
 2. The occupancies in the building below the horizontal assembly are limited to Groups B and M.
 3. The occupancy above the horizontal assembly is limited to a Group S-2 open parking garage.
 4. The building below the horizontal assembly is of Type I or II construction but not less than the type of construction required for the Group S-2 open parking garage above.
 5. The height and area of the building below the horizontal assembly does not exceed the limits set forth in Section 503.
 6. The height and area of the Group S-2 open parking garage does not exceed the limits set forth in Section 406.3. The height, in both feet and stories, of the Group S-2 open parking garage shall be measured from grade plane and shall include the building below the horizontal assembly.
 7. Exits serving the Group S-2 open parking garage discharge directly to a street or public way and are separated from the building below the horizontal assembly by 2-hour fire barriers constructed in accordance with Section 706 or 2-hour horizontal assemblies constructed in accordance with Section 711, or both.

Commenter's Reason: The purpose for the public comment is to eliminate an unintended consequence of the originally proposed revisions. Section 509.8, as originally proposed for revision, could be interpreted as limiting the Group S-2 open parking garage above the horizontal assembly to one building. The current language of Section 509.8 does not intend to limit the open parking garage in such a manner and I did not intend to change that in the proposal. As currently intended and as intended by the revised proposal in this public comment, the Group S-2 open parking garage could consist of more than building.

Final Hearing Results

G157-06/07

AMPC1

Code Change No: G158-06/07

Original Proposal

Section: 509.9 (New)

Proponent: John Berry, Cole + Russell Architects, Inc., Cincinnati, OH

Add new text as follows:

509.9 Multiple buildings above an enclosed or open Group S-2 parking garage. Where two or more buildings are provided above the horizontal assembly separating a Group S-2 open or closed parking garage from the buildings above in accordance with the special provisions in Sections 509.2, 509.3, 509.4 and 509.7, the buildings above the horizontal assembly shall be regarded as separate and distinct buildings and shall comply with all other provisions of this code as applicable to each separate and distinct building.

Reason: This text is needed to clarify when two or more buildings are built atop a common parking garage that the buildings above the garage are to be considered as distinct buildings separate from one another. As an example, this will allow a four-story Type VA Group R-2 condominium building to be built as a separate building from a six-story Type IIA Group B office building. Although this may be obvious to some, I have had more than one jurisdiction interpret that multiple structures above the parking garage are actually one building and are limited to the most restrictive construction type and Use Group provisions. The proposed text legitimizes the evaluation of this example as two distinct buildings for construction type, fire separation distance, suppression, opening protectives, etc.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Modified

Modify proposal as follows:

509.9 Multiple buildings above an enclosed or open Group S-2 parking garage. Where two or more buildings are provided above the horizontal assembly separating a Group S-2 open or closed parking garage from the buildings above in accordance with the special provisions in Sections 509.2, 509.3, ~~509.4~~ and 509.7, the buildings above the horizontal assembly shall be regarded as separate and distinct buildings and shall comply with all other provisions of this code as applicable to each separate and distinct building.

Committee Reason: Clarifies that buildings located above the horizontal separation are allowed to be addressed as separate and distinct buildings from other buildings also located above the same horizontal separation. The modification removes reference to a section that is only focused upon a single building with a parking garage underneath.

Assembly Action:

None

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Rick Thornberry, P.E., The Code Consortium, requests Approval as Modified by this public comment.

Further modify proposal as follows:

509.9 Multiple buildings above an enclosed or open Group S-2 parking garage. Where two or more buildings are provided above the horizontal assembly separating a Group S-2 open or closed parking garage from the buildings above in accordance with the special provisions in Sections 509.2, ~~and 509.3, and 509.7,~~ the buildings above the horizontal assembly shall be regarded as separate and distinct buildings and shall comply with all other provisions of this code as applicable to each separate and distinct building.

Commenter's Reason: The purpose of this Public Comment is to restrict the application of this proposed new section that allows two or more buildings to be located above the horizontal assembly that separates a Group S-2 parking garage from the buildings above so they can be treated as separate and distinct buildings. Currently, we believe the code would only allow that condition to occur for Sections 509.2 and 509.3 which specify that the buildings located above the horizontal assembly are considered separate from the parking garage below the horizontal assembly.

Furthermore, the horizontal assembly in that case is required to have a minimum 3 hour fire-resistance rating which, in effect, serves as a "horizontal" fire wall. Such is not the case for Sections 509.4 and 509.7 which simply specify an occupancy separation between the parking garage and the structure above. Therefore, in addition to the committee action for Approved as Modified which deleted the reference to Section 509.4 we have proposed to delete Section 509.7 from this code change proposal with this Public Comment.

These are different applications that still treat the building as one complete building with a different occupancy located above the Group S-2 parking garage. But they do not treat the horizontal fire separation between the Group S-2 parking garage and the occupancies above as creating a separate and distinct building like Sections 509.2 and 509.3. Therefore, if the membership believes this section is necessary to further clarify the application of the code regarding the buildings constructed above the horizontal assembly specified in the special provisions of Section 509, then we urge the membership to vote to approve this Public Comment. It further amends this code change proposal to delete the reference to Section 509.7 which does not apply for the purpose of this original code change proposal

Final Hearing Results

G158-06/07

AMPC1

Code Change No: G160-06/07

Original Proposal

Table 601

Proponent: Herb Yingling, Greenville County, South Carolina, representing himself

Add new footnote to table as follows:

**TABLE 601
FIRE-RESISTANCE RATING REQUIREMENTS FOR BUILDING ELEMENTS (hours)**

BUILDING ELEMENT
Structural frame ^{a,h}
Bearing walls
Exterior ^{g,h}
Interior

a. through g. (No change to current text)

h. Not less than the fire-resistance rating as referenced in Section 714.5.

(Portions of table and footnotes not shown do not change)

Reason: The purpose of the proposed change is to insure navigation to applicable corresponding section of the code. The reason is to coordinate the appropriate code sections with the table.

The section is commonly overlooked when determining the required ratings of structural members. The most common type of construction that is affected is IIIB construction, however all the "B" types are affected by the section.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The requirements in Section 714.5 for exterior walls are commonly overlooked. This reference in a footnote to Table 601 will ensure that the structural members are protected appropriately.

Assembly Action:

None

Final Hearing Results

G160-06/07

AS

Code Change No: **G168-06/07**

Original Proposal

Section: 603.1

Proponent: Joseph Holland, Hoover Treated Wood Products

Revise as follows:

603.1 Allowable materials. Combustible materials shall permitted in buildings of Type I or Type II construction in the following applications and in accordance with Sections 603.1.1 through 603.1.3:

1. Fire-retardant-treated wood shall be permitted in:
 - 1.1. Nonbearing partitions where the required fire-resistance rating is 2 hours or less.
 - 1.2. Nonbearing exterior walls where no fire rating required.
 - 1.3. Roof construction, including girders, trusses, framing and decking.

Exception: In buildings of Type IA construction exceeding two stories in height, fire-retardant-treated wood is not permitted in roof construction when the vertical distance from the upper floor to the roof is less than 20 feet (6096 mm).

(Items 2 through 22 – no change to text)

Reason: The purpose of this change is to allow FRTW for the roof on a Type IB building.

Under the BOCA code Type 2 construction allowed FRTW use in roof systems. During the conversion from the legacy codes to the IBC changes in the types of construction resulted in the Boca 2A (2,2,1-½,) being eliminated and replaced with the IBC (2,2,2), Type IB. This change reduced the allowable height where FRTW can be used from a maximum of 100 feet to a maximum of 65 feet. Because Type 2A was lost, the roof application where FRTW could be used was unfairly lost. There is no fire record showing FRTW in the roofs of the BOCA 2A building did not perform as expected. By restricting the application to the IBC Type II construction the IBC has created a class of non-conforming building. Example: any business occupancy over 5 stories or any residential occupancy over 4 stories.

A comparison of IBC Type IB and BOCA Type 2A shows they are very similar in the fire protection required for the structural elements. In addition to the built in protection under the IBC, most multistory structures would have to be sprinklered.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The committee felt that allowing fire retardant treated wood in Type IB roof construction when less than 20 feet from the upper floor of a building us appropriate. The allowance is justified based upon the performance history of such materials.

Assembly Action:

None

Final Hearing Results

G168-06/07

AS

Code Change No: **G169-06/07**

Original Proposal

Section: 603.1

Proponent: Philip Brazil, PE, Reid Middleton, Inc., representing himself

Revise as follows:

603.1 Allowable materials. Combustible materials shall be permitted in buildings of Type I or Type II construction in the following applications and in accordance with Sections 603.1.1 through 603.1.3:

1. Fire-retardant-treated wood shall be permitted in:
 - 1.1. Nonbearing partitions where the required fire-resistance rating is 2 hours or less.
 - 1.2. Nonbearing exterior walls where no fire rating is required.
 - 1.3. Roof construction, including girders, trusses, framing and decking.

Exception: In buildings of Type I construction exceeding two stories in height, fire-retardant-treated wood is not permitted in roof construction when the vertical distance from the upper floor to the roof is less than 20 feet (6096 mm).

2. Thermal and acoustical insulation, other than foam plastics, having a flame spread index of not more than 25.

Exceptions:

1. Insulation placed between two layers of noncombustible materials without an intervening airspace shall be allowed to have a flame spread index of not more than 100.
2. Insulation installed between a finished floor and solid decking without intervening airspace shall be allowed to have a flame spread index of not more than 200.
3. Foam plastics in accordance with Chapter 26.
4. Roof coverings that have an A, B or C classification.
5. Interior floor finish ~~and interior finish, trim and floor covering materials installed in accordance with Section 804.~~
6. Millwork such as doors, door frames, window sashes and frames.
7. Interior wall and ceiling finishes installed in accordance with Sections 801 and 803.
8. Trim installed in accordance with Section 806.
9. Where not installed over 15 feet (4572 mm) above grade, show windows, nailing or furring strips and wooden bulkheads below show windows, including their frames, aprons and show cases.
- 7- 10. Finished Finish flooring applied directly to the floor slab or to wood sleepers that are fireblocked in accordance with Section 717.2.7 installed in accordance with Section 805.

(Renumber remaining items #8 through 22 accordingly)

Reason: The purpose of this proposal is to restore portions of the revisions approved in the 2004/2005 code development cycle by code change proposals G154-04/05 (AS) and G160-04/05 (AM) that were inadvertently deleted by public comment #1 on code change proposal FS163-04/05 (D), which was approved at the final action hearings (AMPC1). Four proposals were submitted for the purpose of revising the provisions on floor finish, finished flooring and floor coverings. The fourth proposal was G153-04/05 (AS) in addition to the three proposals listed above. They were developed in coordination with each other and to be heard in a specific order. Proposal FS163-04/05 was intended to be heard last. It was assumed that the four proposals would be assigned to the same committee. Instead, they were assigned to two committees, the Fire Safety and General Code Committees. At the Cincinnati hearings, the Fire Safety Committee met before the General Code Committee. Instead of being heard last, proposal FS163-04/05 was heard first.

The proposed revisions to Section 603.1 in proposals G154-04/05 (AS) and G160-04/05 (AM) had been repeated in proposal FS163-04/05 for the reference of the committee members, assuming proposals G154-04/05 (AS) and G160-04/05 (AM). When I discovered that proposal FS163-04/05 would be heard first, rather than last, a floor amendment was submitted to correct the problem. The floor amendment was not sufficient to obtain approval of proposal FS163-04/05.

The purpose for public comment #1 to proposal FS163-04/05 was to address the committee's concerns with the language in Section 804.4.1 associating interior floor finish with the DOC FF-1 pill test and the rectify what the floor amendment had failed to do. Section 603.1 was included in public comment #1 to eliminate the proposed changes to Section 603.1 in proposal FS163-04/05 because they had already been approved by proposals G154-04/05 and G160-04/05. It was not my intent to reverse the approved revisions. Unfortunately, the effect of public comment #1 to proposal FS163-04/05 was to do just that. This proposal, if approved, will restore the revisions to Section 603.1 that had been approved by proposals G154-04/05 and G160-04/05.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: This proposal fixed a section that was revised but then unintentionally undone during the 04/05 public comment phase.

Assembly Action:

None

Final Hearing Results

G169-06/07

AS

Code Change No: G171-06/07

Original Proposal

Sections: 1203.2.1, IRC R806.1

Proponent: Roger R. Wristen, Collins Products, LLC, Portland, Oregon

THIS PROPOSAL IS ON THE AGENDA OF THE IBC GENERAL AND IRC BUILDING/ENERGY COMMITTEES. SEE THE TENTATIVE HEARING ORDER FOR THESE COMMITTEES.

PART I – IBC

Revise as follows:

1203.2.1 Openings into attic. Exterior openings into the attic space of any building intended for human occupancy shall be covered with corrosion-resistant wire cloth screening, hardware cloth, perforated vinyl or similar material that will prevent the entry of birds, squirrels, rodents, snakes and other similar creatures. ~~The openings therein shall be a minimum of 1/8 inch (3.2 mm) and shall not exceed 1/4 inch (6.4 mm).~~ The openings shall be a penetration or multiple slots not to exceed 12 inches (305 mm) in length with width of the opening shall be a minimum of 1/8 inch (3.2 mm) and shall not exceed 1/4 inch (6.4 mm). Where combustion air is obtained from an attic area, it shall be in accordance with Chapter 7 of the *International Mechanical Code*.

PART II – IRC

Revise as follows:

R806.1 Ventilation required. Enclosed attics and enclosed rafter spaces formed where ceilings are applied directly to the underside of roof rafters shall have cross ventilation for each separate space by ventilating openings protected against the entrance of rain or snow. ~~Ventilating openings shall be provided with corrosion-resistant wire mesh, 1/8 inch (3.2 mm) minimum to 1/4 inch (6.4 mm) maximum openings.~~ The openings shall be a penetration or multiple slots not to exceed 12 inches (305 mm) in length with width of the opening shall be a minimum of 1/8 inch (3.2 mm) and shall not exceed 1/4 inch (6.4 mm).

Reason: The requested change for this product will reduce construction cost and slots will be so placed that venting compliance per Section 1203.2 Attic spaces, will be accomplished. The current language is overly restrictive as the maximum ¼ inch width regardless of length prohibits entry of bird, snakes, etc.

Cost Impact: The code change proposal will decrease the cost of construction and minimize building site errors.

Public Hearing Results

PART I C IBC

Committee Action:

Approved as Modified

Modify the proposal as follows:

1203.2.1 Openings into attic. Exterior openings into the attic space of any building intended for human occupancy shall be protected covered with corrosion-resistant wire cloth screening, hardware cloth, perforated vinyl or similar material that will prevent the entry of birds, squirrels, rodents, snakes and other similar creatures. The openings shall be a penetration or multiple slots not to exceed 12 inches (305 mm) in length with width of the opening shall be a minimum of 1/8 inch (3.2 mm) and shall not exceed 1/4 inch (6.4 mm). Openings for ventilation having a least dimension of 1/8 inch (3.2 mm) minimum and 1/4 inch (6.4 mm) maximum shall be permitted. Openings for ventilation larger than 1/4 inch (6.4 mm) shall be provided with corrosion-resistant wire cloth screening, hardware cloth, perforated vinyl or similar material with 1/8 inch (3.2 mm) minimum and 1/4 inch (6.4 mm) maximum openings. Where combustion air is obtained from an attic area, it shall be in accordance with Chapter 7 of the *International Mechanical Code*.

Committee Reason: The modified proposal provides more flexibility for size and number of openings for attic ventilation. The modification made the allowance for the size of openings in much more general terms to reduce possible confusion of the intention. The intent is that openings greater than 1/4 inch be protected.

Assembly Action:

None

PART II C IRC**Committee Action:**

Approved as Modified

Modify the proposal as follows:

R806.1 Ventilation required. Enclosed attics and enclosed rafter spaces formed where ceilings are applied directly to the underside of roof rafters shall have cross ventilation for each separate space by ventilating openings protected against the entrance of rain or snow. The openings shall be a penetration or multiple slots not to exceed 12 inches (305 mm) in length with width of the opening shall be a minimum of 1/8 inch (3.2 mm) and shall not exceed 1/4 inch (6.4 mm). Ventilation openings shall have a least dimension of 1/16 inch (1.6 mm) minimum and 1/4 inch (6.4 mm) maximum. Ventilation openings larger than 1/4 inch (6.4 mm) shall be provided with corrosion-resistant wire cloth screening, hardware cloth, or similar material with 1/8 inch (3.2 mm) minimum and 1/4 inch (6.4 mm) maximum openings.

Committee Reason: This change permits use of additional products to be used for screening ventilation openings. The modification clarifies the opening limitation on the screening products.

Assembly Action:

None

Final Hearing Results

G171-06/07, Part I	AM
G171-06/07, Part II	AM

Code Change No: G174-06/07

Original Proposal

Section: 1210.1

Proponent: David S. Collins, FAIA, The Preview Group, Inc., representing the American Institute of Architects

Revise as follows:

1210.1 Floors and wall base finish materials. In other than dwelling units, toilet, ~~and~~ bathing and shower room floors finish materials shall have a smooth, hard, nonabsorbent surface. The intersections of such floors with walls shall have a smooth, hard, nonabsorbent vertical base that extends upward onto the walls at least 6 1/4 inches (162 102 mm).

Reason: This code change stems from an interpretation that the floor of a bathroom does not permit the use of tile with a separate base. It was read as requiring a material that is homogenous, such as sheet vinyl or terrazzo. The explanation given was that if the *floor material extends upward*, then it must be continuous and unbroken, and you cannot do that with tile (or any other floor finish) and a separate base. The surface of VCT is slightly porous until it's polished, but it certainly cannot be considered absorbent. There did not appear to be any support in the background of any of the legacy codes that would lead to this interpretation.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The committee agreed with reducing the extension of the wall materials from 6 inches to 4 inches as it is a more reasonable minimum.

Assembly Action:

None

Final Hearing Results

G174-06/07

AS

Code Change No: G182-06/07

Original Proposal

Section: 3002.7

Proponent: Ron Drey, CBO, C-West Code Consultants

Revise as follows:

3002.7 Common enclosure with stairway. Elevators shall not be in a common shaft enclosure with a stairway.

Exception: Open parking garages.

Reason: Taken at face value, Section 3002.7 precludes elevators & stairs in a common shaft enclosure in all cases. This is not true. The infrequent user of the code would have to know to go to Sections 707.14 and 1019.1, Exception.5 to determine that's not the case for open parking garages.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: This exception clarifies that elevators and stairways can be located in a common shaft enclosure when located in an open parking garage. This is specifically allowed in Section 1020.1 exception 5.

Assembly Action:

None

Final Hearing Results

G182-06/07

AS

Code Change No: **G183-06/07**

Original Proposal

Section: 3004.3

Proponent: Ed Donoghue, Edward A. Donoghue Associates, Inc. (EADAI), representing the National Elevator Industry, Inc. (NEII)

Revise as follows:

3004.3 Area of vents. Except as provided for in Section 3004.3.1, the area of the vents shall not be less than $3\frac{1}{2}$ percent of the area of the hoistway nor less than 3 square feet (0.28 m²) for each elevator car, and not less than $3\frac{1}{2}$ percent nor less than 0.5 square feet (0.047 m²) for each dumbwaiter car in the hoistway, whichever is greater. Of the total required vent area, not less than one-third shall be permanently open. Closed portions of the required vent area shall consist of openings glazed with annealed glass not greater than 0.125 inch (3.2 mm) in thickness. The manual override control shall be located in an approved location.

Exception: The total required vent area shall not be required to be permanently open where all the vent openings automatically open upon detection of smoke in the elevator lobbies or hoistway, upon power failure and upon activation of a manual override control.

Reason: To require that an approved location be established for the manual override.

Currently the section does not give any indication of location. This acknowledges that each situation is unique and such a location must be established for each building.

If a manual override control is required a location needs to be established. In this case an exact location can not be mandated within the code because each situation is different.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Modified

Modify the proposal as follows:

3004.3 Area of vents. Except as provided for in Section 3004.3.1, the area of the vents shall not be less than $3\frac{1}{2}$ percent of the area of the hoistway nor less than 3 square feet (0.28 m²) for each elevator car, and not less than $3\frac{1}{2}$ percent nor less than 0.5 square feet (0.047 m²) for each dumbwaiter car in the hoistway, whichever is greater. Of the total required vent area, not less than one-third shall be permanently open. Closed portions of the required vent area shall consist of openings glazed with annealed glass not greater than 0.125 inch (3.2 mm) in thickness. ~~The manual override control shall be located in an approved location.~~

Exception: The total required vent area shall not be required to be permanently open where all the vent openings automatically open upon detection of smoke in the elevator lobbies or hoistway, upon power failure and upon activation of a manual override control. The manual override control shall be located in an approved location.

Committee Reason: Since manual override is required when using the exception to automatically open the vents the location of such controls needs to be addressed. In addition a modification was needed to move the new provisions to the end of the exception instead of the end of the main section. The language was more applicable to the exception which is where the manual control requirements are located.

Assembly Action:

None

Final Hearing Results

G183-06/07

AM

Code Change No: G187-06/07

Original Proposal

Section: 3006.4

Proponent: Ed Donoghue, Edward A. Donoghue Associates, Inc. (EADAI), representing the National Elevator Industry, Inc. (NEII)

Revise as follows:

3006.4 Machine rooms and machinery spaces. Elevator machine rooms and machinery spaces shall be enclosed with fire barriers complying with Section 706 or horizontal assemblies complying with Section 711 having a minimum 1 hour fire-resistance rating and not less than the required rating of the hoistway enclosure served by the machinery. Openings shall be protected with assemblies having a fire-protection rating not less than that required for the hoistway enclosure doors.

Exception: Machine rooms and machinery spaces not abutting and not having any openings to the hoistway enclosure they serve shall be permitted to be enclosed by a 1 hour fire barrier.

Reason: Allows a machine room or machinery space to have a maximum fire resistance rating of 1 hour even if when the hoistway would require a higher rating. Only allowed when they are separate from one another.

The current requirement for Section 3006.4 is too strict for elevator machine rooms that do not abut and do not have any openings to the elevator shaft. Also, some elevators, such as those within an atrium space, are not required to be within a fire-rated hoistway enclosure. The 1 hour room enclosure is drawn from that required by the code for isolating a hazardous contents room from the remainder of the space on a floor.

Similar to code change G171-04/05.

Cost Impact: The code change proposal will decrease the cost of construction.

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The language trying to provide a reduction in fire resistance construction for machinery rooms and spaces not next to the hoistway was not clear. The language in G188-06/07 was clearer though that was also disapproved.

Assembly Action:

None

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because public comments were submitted.

Public Comment 1:

Ed Donoghue, Edward A. Donoghue Associates, Inc. (EADAI), representing the National Elevator Industry, Inc. (NEII), requests Approval as Modified by this public comment.

Replace proposal with the following:

3006.4 Machine rooms and machinery spaces. Elevator machine rooms and machinery spaces shall be enclosed with fire barriers complying with Section 706 or horizontal assemblies complying with Section 711 having a fire-resistance rating not less than the required rating of the hoistway enclosure served by the machinery. Openings shall be protected with assemblies having a fire-protection rating not less than that required for the hoistway enclosure doors.

Exception: Where machine rooms and machinery spaces do not abut and have no openings to the hoistway enclosure they serve the fire barriers complying with 706 or horizontal assemblies complying with Section 711 shall be permitted to be reduced to a 1 hour fire resistance rating.

Commenter's Reason: The original proposal had two objectives. The first was to retain a minimum rating of machine rooms and spaces when the hoistway was not required to be enclosed and the second objective was to give credit to machine rooms and machinery spaces remote from the hoistway. This public comment focuses on the latter. The intent of the original proposal with respect to the new exception was to allow a machine room or machinery space to have a reduced rating of 1 hour when the hoistway would require a 2 hour fire resistance rating in accordance with Section 707.4. This would only be allowed when the hoistway and machine room or machinery space do not abut one another. The current requirement for Section 3006.4 is too strict for elevator machine rooms that do not abut and do not have any openings to the elevator shaft. The language has been revised to be more consistent with that originally proposed by G188-06/07 but retaining a 1 hour minimum rating for the enclosure.

Final Hearing Results

G187-06/07

AMPC1

Code Change No: G188-06/07

Original Proposal

Section: 3006.4

Revise as follows:

3006.4 Machine rooms and machinery spaces. Elevator machine rooms and machinery spaces shall be enclosed with fire barriers complying with Section 706 or horizontal assemblies complying with Section 711 having a fire-resistance rating not less than the required rating of the hoistway enclosure served by the machinery. Openings shall be protected with assemblies having a fire-protection rating not less than that required for the hoistway enclosure doors.

Exception: When machine room and machinery spaces do not abut and have no openings to the hoistway enclosure they serve, the machine room and machinery spaces need not be rated.

Reason: This exception eliminates the need to fire rate the room enclosing the equipment in this situation. The reason is, there are no openings directly from the machine room to the elevator shaft and in some cases the machine room may be in a different part of the building. The intent of this code section is for rooms that become a part of an elevator shaft due to the fact that they have unprotected openings between the room and the shaft due to some of the mechanics involved with the elevator.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: Language is clearer than what is proposed in G187-06/07 but there were concerns related to the lack of fire resistive separation. Specifically how will that affect fire fighter safety when using such elevators? It was suggested that perhaps it should be limited to lower rise buildings.

Assembly Action:

None

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Jim McClintic, Sandy City Corporation, representing the Utah Chapter requests Approval as Modified by this public comment.

Modify proposal as follows:

3006.4 Machine rooms and machinery spaces. Elevator machine rooms and machinery spaces shall be enclosed with fire barriers complying with Section 706 or horizontal assemblies complying with Section 711 having a fire-resistance rating not less than the required rating of the hoistway enclosure served by the machinery. Openings shall be protected with assemblies having a fire-protection rating not less than that required for the hoistway enclosure doors.

Exception: In buildings 4 stories or less, above grade plane when machine room and machinery spaces do not abut and have no openings to the hoistway enclosure they serve, the machine room and machinery spaces need not be rated.

Commenter-s Reason: With committee's recommendations a revision has been added to limit this exception to lower rise buildings and eliminating concerns over fire fighter safety.

Final Hearing Results

G188-06/07

AMPC1

Code Change No: G189-06/07

Original Proposal

Section: 3102.2

Proponent: Juli Case, Industrial Fabrics Association International

Revise definition as follows:

3102.2 Definitions. The following words and terms shall, for the purposes of this section and as used elsewhere in this code, have the meanings shown herein:

AIR-INFLATED STRUCTURE. ~~A building where the shape of the structure is maintained by air pressurization of cells or tubes to form a barrel vault over the usable area.~~ A structure that uses air-pressurized membrane beams, arches or other elements to enclose space. Occupants of such a structure do not occupy the pressurized area used to support the structure.

Reason: To clarify the code. The suggested wording more accurately reflects terminology currently utilized in the membrane structure industry.

Members of the Industrial Fabrics Association International, including the Lightweight Structures Association; the Professional Awning Manufacturers Association; the Tent Rental Division; and the Banner, Flag & Graphics Association, worked jointly on assessing terminology. Participants reflected backgrounds in engineering, architecture, end product manufacturing and component suppliers.

The change reflected in the proposed definition is already being used in the membrane structure industry, having been published in the *Fabric Architecture* and *Industrial Fabric Products Review* magazines, published on the Lightweight Structures Association website, and used by the IFAI International Achievement Awards program.

Bibliography:

"By Any Other Name," *Industrial Fabric Products Review*, volume 91, Number 1, January 2006.
"A Defining Moment for Fabric Structures," *InTents*, volume 12, number 1, February/March 2005
"Defining the Basics," *InTents*, Volume 13, Number 1, February/March 2006
Lightweight Structures Association, Structure Definitions, <http://www.lightweightstructures-ifai.com>
IFAI International Achievement Awards 2006 entry brochure

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The revision allows greater flexibility for the types of air inflated structures available. The current definition is limited in scope.

Assembly Action:

None

Final Hearing Results

G189-06/07

AS

Code Change No: **G190-06/07**

Original Proposal

Section: 3104.5

Proponent: Marshall A. Klein, P.E., Marshall A. Klein and Associates, Inc., representing the Erickson Retirement Communities

Revise as follows:

3104.5 Fire barriers between pedestrian walkways and buildings. Walkways shall be separated from the interior of the building by fire-barrier walls with a fire-resistance rating of not less than 2 hours. This protection shall extend vertically from a point 10 feet (3048 mm) above the walkway roof surface or the connected building roof line, whichever is lower, down to a point 10 feet (3048 mm) below the walkway and horizontally 10 feet (3048 mm) from each side of the pedestrian walkway. Openings within the 10-foot (3048 mm) horizontal extension of the protected walls beyond the walkway shall be equipped with devices providing a $\frac{3}{4}$ -hour fire protection rating in accordance with Section 715.

Exception: The walls separating the pedestrian walkway from a connected building and the openings within the 10 foot horizontal extension of the protected walls beyond the walkway are not required to have a fire-resistance rating by this section where any of the following conditions exist:

1. The distance between the connected buildings is more than 10 feet (3048 mm), the pedestrian walkway and connected buildings, except for open parking garages, are equipped throughout with an automatic sprinkler system in accordance with NFPA 13 and the wall is constructed of a tempered, wired or laminated glass wall and doors subject to the following:
 - 1.1. The glass shall be protected by an automatic sprinkler system in accordance with NFPA 13 and the sprinkler system shall completely wet the entire surface of interior sides of the glass wall when actuated.
 - 1.2. The glass shall be in a gasketed frame and installed in such a manner that the framing system will not deflect without breaking (loading) the glass before the sprinkler operates.
 - 1.3. Obstructions shall not be installed between the sprinkler heads and the glass.
2. The distance between the connected buildings is more than 10 feet (3048 mm) and both sidewalls of the pedestrian walkway are at least 50 percent open with the open area uniformly distributed to prevent the accumulation of smoke and toxic gases.
3. Buildings are on the same lot in accordance with Section 503.1.2.
4. Where exterior walls of connected buildings are required by Section 704 to have a fire-resistance rating greater than 2 hours, the walkway shall be equipped throughout with an automatic sprinkler system installed in accordance with NFPA 13.

Reason: The additional wording is intended to be editorial in order to clarify the application of the Exception to the base requirements of Section 3104.5. This section of the IBC (verbatim) on pedestrian walkways was originally from the BOCA Code. It was the result of BOCA Code Change B43-89, that was submitted by John W. McCormick, P.E., Rolf Jenson & Associates (Mr. McCormick is now a principle at Code Consultants, Inc., St. Louis, MO).

According to BOCA Code Change B43-89 supporting statement, and how it was applied under the BOCA Code when incorporated into the 1990 edition, the application of the exception conditions to Section 3104.5 are intended to apply to all the base requirements of Section 3104.5.

The base requirements of Section 3104.5 are to provide:

1. On each side of the pedestrian walkway, where the walkway connects to the buildings, the *interior* walls between the walkway and the connected buildings shall be 2 hour fire rated.
2. For 10' around the exterior of the pedestrian walkway, where the walkway connects to the buildings, the *exterior* walls of the buildings shall be 2 hour fire rated.
3. For 10' horizontally out from the exterior of the pedestrian walkway, where the walkway connects to the buildings, any *exterior* openings of the buildings shall be $\frac{3}{4}$ hour fire rated.

Therefore, the intent of the Section 3104.5 Exception is that application of *any* of the four listed design alternatives under the exception will apply to *all* the base requirements of Section 3104.5.

Since its inclusion into the first edition of the IBC, some designers and code officials are misunderstanding the application of this Exception and *only* applying the Exception to the *interior* walls between the walkway and the connected buildings (Base requirement #1 noted above). This is incorrect, and the proposed additional text is only intended to clear up this confusion.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: Clarifies that the exception not only applies to the wall but also to the openings contained in the wall. This reduces potential confusion for designers and authorities.

Assembly Action:

None

Final Hearing Results

G190-06/07

AS

Code Change No: G191-06/07

Original Proposal

Section: 3104.5

Proponent: Marshall A. Klein, P.E., Marshall A. Klein and Associates, Inc., representing the Erickson Retirement Communities

Revise as follows:

3104.5 Fire barriers between pedestrian walkways and buildings. Walkways shall be separated from the interior of the building by fire-barrier walls with a fire-resistance rating of not less than 2 hours. This protection shall extend vertically from a point 10 feet (3048 mm) above the walkway roof surface or the connected building roof line, whichever is lower, down to a point 10 feet (3048 mm) below the walkway and horizontally 10 feet (3048 mm) from each side of the pedestrian walkway. Openings within the 10-foot (3048 mm) horizontal extension of the protected walls beyond the walkway shall be equipped with devices providing a 3/4-hour fire protection rating in accordance with Section 715.

Exception: The walls separating the pedestrian walkway from a connected building are not required to have a fire-resistance rating by this section where any of the following conditions exist:

1. The distance between the connected buildings is more than 10 feet (3048 mm), ~~and~~ ~~the~~ pedestrian walkway and connected buildings, except for open parking garages, are equipped throughout with an automatic sprinkler system in accordance with NFPA 13, ~~and~~ ~~the~~ wall is capable of resisting the passage of smoke or is constructed of a tempered, wired or laminated glass wall and doors subject to the following:
 - 1.1. The wall or glass separating the interior of the building from the pedestrian walkway shall be protected by an automatic sprinkler system in accordance with NFPA 13 and the sprinkler system shall completely wet the entire surface of interior sides of the ~~glass wall~~ or glass when actuated.
 - 1.2. The glass shall be in a gasketed frame and installed in such a manner that the framing system will deflect without breaking (loading) the glass before the sprinkler operates.
 - 1.3. Obstructions shall not be installed between the sprinkler heads and the wall or glass.
2. The distance between the connected buildings is more than 10 feet (3048 mm) and both sidewalls of the pedestrian walkway are at least 50 percent open with the open area uniformly distributed to prevent the accumulation of smoke and toxic gases.
3. Buildings are on the same lot in accordance with Section 503.1.2.
4. Where exterior walls of connected buildings are required by Section 704 to have a fire-resistance rating greater than 2 hours, the walkway shall be equipped throughout with an automatic sprinkler system installed in accordance with NFPA 13.

Reason: The existing first sentence of Condition #1 is recommended to be broken into three separate sentences for editorial purposes. The existing first sentence has three distinct code requirements that are more user-friendly to understand if broken into three sentences.

The rest of the additional wording is intended to provide a reasonable equivalency to Condition #1 when the wall assembly is not entirely comprised of glass.

This section of the IBC (verbatim) on pedestrian walkways was originally from the BOCA Code. It was the result of BOCA Code Change B43-89, that was submitted by John W. McCormick, P.E., Rolf Jenson & Associates (Mr. McCormick is now a principle at Code Consultants, Inc., St. Louis, MO).

There are reasonable designs where the walls between the walkways and the connected buildings are a combination of both glass and drywall (or other solid opaque material) that are capable of resisting the passage of smoke equal to, or better, than the glass criteria stated under Condition #1. The added terminology used for this proposal "...capable of resisting the passage of smoke..." is consistent with the same wording used for construction of similar walls for incidental uses under Section 508.2.2.1.

Based on a recent informal interpretation from ICC staff, the literal text of Condition #1 would only permit assemblies entirely constructed of glass to be provided. Even though other wall assemblies may be equal to or better than glass, such as a wall "...capable of resisting the passage of smoke...", such a reasonable alternative would need to be considered under the present Code by way of Sections 104.10, "Modifications", and 104.11, "Alternative materials, design and methods of construction and equipment".

There is no reduction in the fire protection/life safety under this proposal, and one could reasonably argue that the proposed type of wall assembly added to this Condition #1 is not as smoke resistant as the glass wall condition now permitted under the existing Condition #1. This common situation of a glass wall, or solid wall capable of resisting the passage of smoke, or any combination of the two types, should be incorporated into the text of Condition #1 since it is a reasonable and logical design of such wall assemblies in the past, present and future editions of this Code.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: This proposal was accepted as it would allow a solid wall the same exception already afforded to a glass wall as indicated in exception 1. A solid wall provides a equal or greater level of protection.

Assembly Action:

None

Final Hearing Results

G191-06/07

AS

Code Change No: G198 -06/07

Original Proposal

Sections: 3403.3 (IEBC [B] 302.3)

Proponent: William W. Stewart, FAIA, Chesterfield, MO, representing himself

Revise as follows:

3403.3 (IEBC 302.3) Nonstructural. Nonstructural alterations or repairs to an existing building or structure are permitted to be made of the same materials of which the building or structure is constructed, provided that they do not adversely affect any structural member or the fire-resistance rating of any part of the building or structure.

The work shall not make the building less conforming to the building, plumbing, mechanical, electrical or fire codes of the jurisdiction, or to alternative materials, design and methods of construction, or to any previously approved plans, modifications, alternative methods, or compliance alternatives, than it was before the repair was undertaken.

Reason: Section 3403.3 covers repairs fairly well but by adding the words from Section 401.3 in the *International Existing Building Code*, Section 3403.3 makes it even better.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The committee felt that the additional statement will ensure that the building or portion thereof will retain a baseline of compliance.

Assembly Action: **None**

Final Hearing Results

G198-06/07

AS

Code Change No: G199-06/07

Original Proposal

Sections: 3403.4.1 (New) [IEBC [B] 302.4.1 (New)]

Proponent: Bill Conner, Oak Park, IL, representing himself

Add new text as follows:

3403.4.1 (IEBC 302.4.1) Handrails. In alterations or replacement of an existing stairway in an existing structure, handrails shall comply with Section 1009.10.

Exception: In alterations, full extension of the handrails in accordance with Section 1012.5 is not required where such extensions would be hazardous due to plan configuration.

Reason: Replacement of handrails on existing stairways that meet new construction requirements may result in a conflict with the extensions and paths for means of egress. This proposed section would be a subsection of Section 3403.4 (IEBC 302.4), Stairways. This proposed language would be a coordination item with Section 505.10, Exception 3 of ICC A117.1 and the ADA/ABA Guidelines.

There does not appear to be a location that addressed existing stairways in the remaining chapters of the IEBC.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action: **Approved as Submitted**

Committee Reason: The proposed language adds much needed language to address a potentially hazardous condition in existing buildings.

Assembly Action: **None**

Final Hearing Results

G199-06/07

AS

Code Change No: **G203-06/07**

Original Proposal

Sections: 3409.1, 3409.4.1 (New), 3409.4.2 (New) [IEBC [B] 308.4, [B] 308.4.1 (New), [B] 308.4.2 (New)]; IEBC 912.8, 912.8.1 (New), 912.8.2 (New)

Proponent: Brian D. Black, BD Black Codes, Inc., Perry, NY, representing himself

THIS PROPOSAL IS ON THE AGENDA OF THE IBC GENERAL AND IEBC CODE DEVELOPMENT COMMITTEES. SEE THE TENTATIVE HEARING ORDER FOR THESE COMMITTEES

PART I – IBC

Revise as follows:

3409.4 (IEBC 308.4) Change of occupancy. Existing buildings, ~~or portions thereof,~~ that undergo a change of group or occupancy shall ~~have all of the following accessible features~~ comply with this section:

3409.4.1 (IEBC 308.4.1) Partial change in occupancy. Where a portion of the building is changed to a new occupancy classification, any alterations shall comply with Sections 3409.6, 3409.7 and 3409.8.

3409.4.2 (IEBC 308.4.2) Complete change of occupancy. Where an entire building undergoes a change of occupancy, it shall comply with Section 3409.4.1 and shall have all of the following accessible features:

1. At least one accessible building entrance.
2. At least one accessible route from an accessible building entrance to primary function areas.
3. Signage complying with Section 1110.
4. Accessible parking, where parking is being provided.
5. At least one accessible passenger loading zone, when loading zones are provided.
6. At least one accessible route connecting accessible parking and accessible passenger loading zones to an accessible entrance.

Where it is technically infeasible to comply with the new construction standards for any of these requirements for a change of group or occupancy, the above items shall conform to the requirements to the maximum extent technically feasible. ~~Change of group or occupancy that incorporates any alterations or additions shall comply with this section and Sections 3409.5, 3409.6, 3409.7 and 3409.8.~~

PART II – IEBC

1. Revise as follows:

912.8 Accessibility. Existing buildings ~~or portions thereof~~ that undergo a change of group or occupancy classification shall ~~have all of the following accessible features:~~ comply with this section.

912.8.1 Partial change in occupancy. Where a portion of the building is changed to a new occupancy classification, any alterations shall comply with Sections 605 and 706 as applicable.

912.8.2 Complete change of occupancy. Where an entire building undergoes a change of occupancy, it shall comply with Section 912.8.1 and shall have all of the following accessible features:

1. At least one accessible building entrance.
2. At least one accessible route from an accessible building entrance to primary function areas.
3. Signage complying with Section 1110 of the *International Building Code*.
4. Accessible parking, where parking is provided.
5. At least one accessible passenger loading zone, where loading zones are provided.
6. At least one accessible route connecting accessible parking and accessible passenger loading zones to an accessible entrance.

Where it is technically infeasible to comply with the new construction standards for any of these requirements for a change of group or occupancy, the above items shall conform to the requirements to the maximum extent technically feasible. ~~Changes of group or occupancy that incorporate any alterations or additions shall comply with this section and Sections 605.1 and 1005.1 as applicable.~~

Exception: Type B dwelling or sleeping units required by Section 1107 of the *International Building Code* are not required to be provided in existing buildings and facilities.

Reason: The purpose of the proposed code change is to establish a realistic benchmark at which a building must be provided with accessible features, regardless of cost, beyond those required in alterations.

The code requires that elements or spaces being altered comply with the accessibility requirements of ICC A117.1. Additional requirements apply where alterations affect an area containing a primary function, many of which may be included in the 'laundry list' in the current change of occupancy provisions of Section 3409.4. The difference is that when a space is altered, the additional requirements are capped at a cost of 20% of the base alteration cost, whereas the requirements for a change of occupancy have no cap.

This proposal offers a compromise by requiring the additional accessible elements to be provided regardless of cost only where an entire building is undergoing a change of occupancy. It is reasonable to insure this greater level of access where an existing high school building is being converted to apartments, or where an old warehouse is changed to a business occupancy containing office suites.

The problem is that the current code requires accessible entrances, routes, parking, *etc.* regardless of the size of an occupancy being changed or the cost of the alterations (if any) involved in that change. Changing a 500 square foot space in a building from a boutique jewelry store to a tax preparer's office could involve no building alterations and the simple removal of display cases and moving in a few desks and file cabinets, but the code could require a ramp or platform lift to get to that space that changed from a Group M to Group B occupancy. In some cases, the costs would far exceed the 20% cap in 3409.7 but would still be required by this section. Moreover, many of the changes required could be beyond the control of the person leasing that 500 s.f. tax office space, where a building manager or agent controls the corridors, entrances, parking areas, and building signs.

This proposal recognizes the fact that the ICC and legacy codes have traditionally placed a higher standard of code compliance on buildings and spaces undergoing a change of occupancy, and acknowledges the fact that the history of the code's access requirements – stretching back to the BCMC Accessibility Report -- included accessibility for persons with disabilities in that higher standard. At the same time, imposing excessively high costs for converting the use of portions of existing buildings is not supported by the ADA, the intent of the original code writers, or the economic realities of effectively reusing our nation's existing building stock. Applying the laundry list in 3409.4 only where an entire building undergoes a change of occupancy makes sense.

References to 3409.5 were deleted because the accessibility requirements for additions will apply regardless of the requirements of this section.

NOTE: This proposed change does not affect the harmonization of the code with the ADA or Fair Housing and is consistent with the U.S. Department of Justice interpretation of landlord-tenant responsibilities under its ADA regulations.

Cost Impact: This code change will not increase the cost of construction.

Public Hearing Results

PART I C IBC

Committee Action:

Approved as Submitted

Committee Reason: The proposed language clarifies the scope and achieves an appropriate level of accessibility for existing buildings. A partial change of occupancy will be handled similar to an alteration. The list of elements are only required where an entire building undergoes a change of occupancy.

Assembly Action:

None

PART II C IEBC

Committee Action:

Approved as Submitted

Committee Reason: The committee felt that this proposal achieved an appropriate level of accessibility for existing buildings by clarifying that the accessible features currently listed in Section 912.8 are only required where an entire building undergoes a change of occupancy. Further, this language provides relief to existing buildings where there is only a partial change of occupancy.

Assembly Action:

None

Final Hearing Results

**G203-06/07, Part I
G203-06/07, Part II**

**AS
AS**

Code Change No: **G206-06/07**

Original Proposal

Sections: 3409 .1, 3409.6, 3409.8.7 (IEBC) [B] 308.1, [B] 308.6, [B] 308.8.7; IEBC 605.1, 605.1.8, 706.3, 912.8

Proponent: Brian D. Black, BD Black Codes, Inc., Perry, NY, representing himself

PART I B IBC

Revise as follows:

3409.1 (IEBC 308.1) Scope. The provisions of Sections 3409.1 (IEBC 308.1) through 3409.9 (IEBC 308.9) apply to maintenance, change of occupancy, additions and alterations to existing buildings, including those identified as historic buildings.

Exception: Type B dwelling or sleeping units required by Section 1107 are not required to be provided in existing buildings and facilities being altered or undergoing a change of occupancy.

3409.6 (IEBC 308.6) Alterations. A building, facility or element that is altered shall comply with the applicable provisions in Chapter 11 and ICC A117.1, unless technically infeasible. Where compliance with this section is technically infeasible, the alteration shall provide access to the maximum extent technically feasible.

Exceptions:

1. The altered element or space is not required to be on an accessible route, unless required by Section 3409.7 (IEBC 308.7).
2. Accessible means of egress required by Chapter 10 are not required to be provided in existing buildings and facilities.
3. ~~The alteration to Type A individually owned dwelling units within a Group R-2 occupancy shall meet the provision for a Type B dwelling unit and shall comply with the applicable provisions in Chapter 11 and ICC/ANSI A117.1. Type A dwelling units or sleeping units required by Section 1107 are not required to be provided in existing building and facilities being altered.~~

3409.8.7 (IEBC 308.8.7) Dwelling or sleeping units. Where I-1, I-2, I-3, R-1, R-2 or R-4 dwelling or sleeping units are being altered or added, the requirements of Section 1107 for Accessible ~~or Type A~~ units and Section 907 for accessible alarms apply only to the quantity of spaces being altered or added.

PART II B IEBC

1. Revise as follows:

605.1 General. A building, facility or element that is altered shall comply with the applicable provisions in Sections 605.1.1 through 605.1.12, Chapter 11 of the *International Building Code* and ICC A117.1 unless it is technically infeasible. Where compliance with this section is technically infeasible, the alteration shall provide access to the maximum extent that is technically feasible. A building, facility or element that is constructed or altered to be accessible shall be maintained accessible during occupancy.

Exceptions:

1. The altered element or space is not required to be on an accessible route unless required by Section 605.2.
2. Accessible means of egress required by Chapter 10 of the *International Building Code* are not required to be provided in existing buildings and facilities.

3. ~~Type A and Type B dwelling or sleeping units required by Section 1107 of the *International Building Code* are not required to be provided in existing buildings and facilities being altered.~~
4. ~~The alteration to Type A individually owned dwelling units within a Group R-2 occupancy shall meet the provisions for Type B dwelling units and shall comply with the applicable provisions in Chapter 11 of the *International Building Code* and ICC A117.1.~~

605.1.8 Dwelling units and sleeping units. Where Group I-1, I-2, I-3, R-1, R-2, or R-4 dwelling or sleeping units are being altered, the requirements of Section 1107 of the *International Building Code* for Accessible units ~~or Type A units~~ and Chapter 9 of the *International Building Code* for accessible alarms apply only to the quantity of spaces being altered.

706.3 Dwelling units and sleeping units. Where Group I-1, I-2, I-3, R-1, R-2, or R-4 dwelling units or sleeping units are being added, the requirements of Section 1107 of the *International Building Code* for Accessible units ~~or Type A units~~ and Chapter 9 of the *International Building Code* for accessible alarms apply only to the quantity of spaces being added.

912.8 Accessibility. Existing buildings or portions thereof that undergo a change of group or occupancy classification shall have all of the following accessible features:

1. At least one accessible building entrance.
2. At least one accessible route from an accessible building entrance to primary function areas.
3. Signage complying with Section 1110 of the *International Building Code*.
4. Accessible parking, where parking is provided.
5. At least one accessible passenger loading zone, where loading zones are provided.
6. At least one accessible route connecting accessible parking and accessible passenger loading zones to an accessible entrance.

Where it is technically infeasible to comply with the new construction standards for any of these requirements for a change of group or occupancy, the above items shall conform to the requirements to the maximum extent technically feasible. Changes of group or occupancy that incorporate any alterations or additions shall comply with this section and Sections 605.1 and 1005.1 as applicable.

Exception: Type B dwelling or sleeping units required by Section 1107 of the *International Building Code* are not required to be provided in existing buildings and facilities undergoing a change of occupancy.

Public Hearing Results

PART I C IBC

Committee Action:

Approved as Modified

Modify the proposal as follows:

3409.6 (IEBC 308.6) Alterations. A building, facility or element that is altered shall comply with the applicable provisions in Chapter 11 and ICC A117.1, unless technically infeasible. Where compliance with this section is technically infeasible, the alteration shall provide access to the maximum extent technically feasible.

Exceptions:

1. The altered element or space is not required to be on an accessible route, unless required by Section 3409.7 (IEBC 308.7).
2. Accessible means of egress required by Chapter 10 are not required to be provided in existing buildings and facilities.
3. The alteration to Type A individually owned dwelling units within a Group R-2 occupancy shall meet the provision for a Type B dwelling unit and shall comply with the applicable provisions in Chapter 11 and ICCI A117.1.
4. Type A dwelling units or sleeping units required by Section 1107 are not required to be provided in existing building and facilities being altered.

(Portions of proposal not shown remain unchanged)

Committee Reason: The proposed language clarifies when Type A units and Type B units are exempted in existing buildings. The modification was to maintain Section 3409.6 Exception 3. This language was added in the last code change cycle to allow Type A units in an existing building being altered to meet Type B unit requirements. This exception is still needed.

Assembly Action:

None

PART II C IEBC**Committee Action:****Disapproved**

Committee Reason: The committee indicated that requirements for Type A individually owned units within a Group R-2 occupancy currently contained in Exception 4 to Section 605.1 were appropriate with the intent of the IEBC by allowing flexibility to the owner and therefore should remain.

Assembly Action:**None**

Final Hearing Results

G206-06/07, Part I	AM
G206-06/07, Part II	D

Code Change No: G208-06/07

Original Proposal

Sections: 3409.8.4 (IEBC [B] 308.8.4); IEBC 706.2

Proponent: Bill Conner, Oak Park, IL, representing himself

THIS PROPOSAL IS ON THE AGENDA OF THE IBC GENERAL AND IEBC CODE DEVELOPMENT COMMITTEES. SEE THE TENTATIVE HEARING ORDER FOR THESE COMMITTEES

PART I – IBC**Revise as follows:**

3409.8.4 (IEBC 308.8.4) Stairs and escalators in existing buildings. In alterations, change or occupancy or additions where an escalator or stair is added where none existed previously and major structural modifications are necessary for installation, an accessible route shall be provided between the levels served by the escalator or stairs in accordance with Sections 1104.4 and 1104.5.

PART II – IEBC**Revise as follows:**

706.2 Stairs and escalators in existing buildings. In alterations, change of occupancy or additions where an escalator or stair is added where none existed previously and major structural modifications are necessary for installation, an accessible route shall be provided between the levels served by the escalator or stairs in accordance with Sections 1104.4 and 1104.5 of the *International Building Code*.

Reason: The proposed language would coordinate with ADA 206.2.3.1. The ADAAG approach seems more reasonable for when an elevator or platform lift would be required.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

PART I — IBC**Committee Action:****Approved as Submitted**

Committee Reason: The proposed text is a good clarification for when the provisions are applicable for new escalators and stairways.

Assembly Action:**None**

PART II — IEBC

Committee Action:

Disapproved

Committee Reason: The committee indicated that providing requirements for change of occupancy and additions in the alterations chapter would be confusing to the code user. These proposed requirements would be more appropriately located in the chapters dealing with additions and change of occupancy. Additionally, the reason statement indicates coordination with portions of ADA; however, it does not appear that all of those portions are part of this change.

Assembly Action:

None

Final Hearing Results

G208-06/07, Part I	AS
G208-06/07, Part II	D

Code Change No: G209-06/07

Original Proposal

Sections: 3409.8.7 (IEBC [B] 308.8.7); IEBC 605.1.8, 706.3

Proponent: Maureen Traxler, City of Seattle, WA, representing the Washington Association of Building Officials

THIS PROPOSAL IS ON THE AGENDA OF THE IBC GENERAL AND IEBC CODE DEVELOPMENT COMMITTEES. SEE THE TENTATIVE HEARING ORDER FOR THESE COMMITTEES

PART I – IBC

Revise as follows:

3409.8.7 (IEBC 308.8.7) Dwelling or sleeping units. Where I-1, I-2, I-3, R-1, R-2 or R-4 dwelling or sleeping units are being altered or added, the requirements of Section 1107 for Accessible or Type A units and Section 907 for ~~accessible~~ visible alarms apply only to the quantity of spaces being altered or added.

PART II – IEBC

Revise as follows:

605.1.8 Dwelling or sleeping units. Where Group I-1, I-2, I-3, R-1, R-2, or R-4 dwelling or sleeping units are being altered, the requirements of Section 1107 of the *International Building Code* for accessible or Type A units and Chapter 9 of the *International Building Code* for ~~accessible~~ visible alarms apply only to the quantity of the spaces being altered.

706.3 Dwelling units and sleeping units. Where Group I-1, I-2, I-3, R-1, R-2, or R-4 dwelling units or sleeping units are being added, the requirements of Section 1107 of the *International Building Code* for accessible units or Type A units and Chapter 9 of the *International Building Code* for ~~accessible~~ visible alarms apply only to the quantity of spaces being added.

Reason: The term “accessible alarm” is not used anywhere in either the Building or Fire code except in this section. This provision is ambiguous because it references Chapter 9 for accessible alarm provisions, but there are no such provisions in Chapter 9. The term “visible alarm” is a commonly accepted term to describe the devices used to alert persons with hearing disabilities.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

PART I C IBC

Committee Action:

Approved as Submitted

Committee Reason: The term >accessible alarm= is not defined. The use of the term >visible alarm= will clarify what type of alarms are being addressed for dwelling and sleeping units undergoing alterations. The terminology will be consistent with Chapter 9 of the IBC and IFC.

Assembly Action: **None**

PART II C IEBC

Committee Action: **Approved as Submitted**

Committee Reason: The committee agreed that changing the term "accessible alarm" to "visible alarm", with respect to requirements for dwelling units undergoing alterations, was appropriate and consistent with terminology used in both the IBC and IFC.

Assembly Action: **None**

Final Hearing Results

G209-06/07, Part I	AS
G209-06/07, Part II	AS

Code Change No: G210-06/07

Original Proposal

Sections: 3409.8.11 (IEBC [B] 308.8.11)

Proponent: Curt Whiele, Brooklyn Park, MN, representing himself

Delete without substitution:

~~**3409.8.11 (IEBC 308.8.11) Check-out aisles.** Where check-out aisles are altered, at least one of each check-out aisle serving each function shall be made accessible until the number of accessible check-out aisles complies with Section 1109.12.2.~~

Reason: Delete to match the provisions in IEBC, Chapter 6. The section is not needed because it is already covered by complying with requirements for areas being altered. The same should occur in the IEBC, Chapter 3 since this is a copy of IBC Chapter 34.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action: **Approved as Submitted**

Committee Reason: The provisions for check-out aisles are already addressed adequately in the general provisions for alterations. This language is not needed.

Assembly Action: **None**

Final Hearing Results

G210-06/07	AS
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Code Change No: **G211-06/07**

Original Proposal

Sections: 3409.8.12 (New) [IEBC [B] 308.8.12 (New)]; IEBC 605.1.11 (New)

Proponent: Bill Conner, Oak Park, IL, representing himself

THIS PROPOSAL IS ON THE AGENDA OF THE IBC GENERAL AND IEBC CODE DEVELOPMENT COMMITTEES. SEE THE TENTATIVE HEARING ORDER FOR THESE COMMITTEES

PART I – IBC

Add new text as follows:

3409.8.12 (IEBC 308.8.12) Fuel dispensers. Operable parts of replacement fuel dispensers shall be permitted to be 54 inches (1370 mm) maximum measured from the surface of the vehicular way where fuel dispensers are installed on existing curbs.

PART II – IEBC

Add new text as follows:

605.1.11 Fuel dispensers. Operable parts of replacement fuel dispensers shall be permitted to be 54 inches (1370 mm) maximum measured from the surface of the vehicular way where fuel dispensers are installed on existing curbs.

Reason: The proposal adds an exception for replacement fuel dispensing equipment providing an exception for maximum high reach range of 54 inches. Current ANSI A117.1 sets the maximum reach range at 48". This change will allow the use of existing equipment when it is installed on existing fuel dispensing islands.

Cost Impact: The code change proposal will not increase the cost of construction. There would be a cost increase if the proposal is not approved as existing fuel dispensing islands or existing inventory of replacement fuel dispensers could not be used as replacements for damaged or non working equipment.

Public Hearing Results

PART I C IBC

Committee Action:

Approved as Submitted

Committee Reason: This proposal would be consistent with the action on E168-04/05. Also the committee agreed that equipment installed on existing fuel dispensing islands is an alteration and allowance should be made for a height that would permit the reuse of the existing equipment.

Assembly Action:

None

PART II C IEBC

Committee Action:

Approved as Submitted

Committee Reason: The committee agreed that equipment installed (as an alteration) on existing fuel dispensing islands should be at a height that would allow the reuse of the existing equipment.

Assembly Action:

None

Final Hearing Results

G211-06/07, Part I AS
G211-06/07, Part II AS

Code Change No: **G213-06/07**

Original Proposal

Section: 3410.6.18 (New), Table 3410.6.18 (New), Table 3410.7

Proponent: Greg Wheeler, C.B.O., Chair, ICC Ad Hoc Committee on Existing Buildings

1. Add new text and table as follows:

3410.6.18 Standpipes. Evaluate the ability to initiate attack on a fire by making supply of water available readily through the installation of standpipes in accordance with Section 905. "Required Standpipes" shall be based on the requirements of this code. Under the categories and occupancies in Table 3410.6.18, determine the appropriate value and enter that value into Table 3410.7 under Safety Parameter 3410.6.18, Standpipes, for fire safety, means of egress, and general safety.

3410.6.18.1 Standpipe. The categories for standpipe systems are:

1. Category a—Standpipes are required; standpipe is not provided or the standpipe system design is not in compliance with Section 905.3.
2. Category b—Standpipes are not required; none are provided.
3. Category c—Standpipes are required; standpipes are provided in accordance with Section 905.
4. Category d—Standpipes are not required; standpipes are provided in accordance with Section 905.

(Renumber subsequent sections)

**TABLE 3410.6.18
STANDPIPE SYSTEM VALUES**

OCCUPANCY	CATEGORIES			
	a^a	b	c	D
A-1, A-3, F, M, R, S-1	-6	0	4	6
A-2	-4	0	2	4
A-4, B, E, S-2	-12	0	6	12

a. This option cannot be taken if Category a or Category b in Section 3410.6.17 is used

2. Revise table as follows:

**TABLE 3410.7
SUMMARY SHEET — BUILDING CODE**

SAFETY PARAMETERS	FIRE SAFETY (FS)	MEANS OF EGRESS (ME)	GENERAL SAFETY (GS)
3410.6.16 Mixed Occupancies		****	
3410.6.17 Automatic Sprinklers		÷2 =	
3410.6.18 Standpipes			
3410.6.18 3410.6.19 Incidental Use			

(Portions of table not shown do not change)

Reason: The ICC Board established the Ad Hoc Committee on Existing Buildings to evaluate and further refine the IEBC in response to issues raised by the membership over the past couple of code development cycles. This proposal coordinates the compliance alternatives of CH 34 of the IBC with the same alternatives found in Chapter 13, Section 1301.6.18, of the IEBC. The inconsistency occurred in 2001 during the drafting stage of the IEBC when the proposed entry for standpipes was added to the IEBC, however, a coordinating change by the proponent was not submitted to the IBC. The inconsistency occurs in both the 2003 and 2006 editions of the codes.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: Provides credit for standpipes in the existing building requirements. Makes the existing building provisions more comprehensive. See also proponents reason.

Assembly Action:

None

Final Hearing Results

G213-06/07

AS

Code Change No: G214-06/07

Original Proposal

Sections: 3410.2.5 (IEBC [B] 1301.2.5)

Proponent: Curt Wiehle, Brooklyn Park, MN, representing himself

Revise as follows:

3410.2.5 (IEBC 1301.2.5) Accessibility requirements. All portions of the buildings proposed for change of occupancy shall conform to the accessibility provisions of ~~Chapter 11~~ Section 3409 (IEBC Section 308).

Reason: New construction requirements for accessibility should not be required when compliance alternatives are utilized in existing buildings. Provisions should be the same as they are for alterations or change of occupancy. This is a conflict with how ADA would deal with existing buildings.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The proposed revision clarifies that a building using the compliance alternatives of IBC Section 3410 (IEBC 1301) are typically undergoing alterations, and therefore should use the provisions for accessibility for existing building in Section 3409 (IEBC 308). The current language could be interpreted to require full compliance for accessibility as in new construction.

Assembly Action:

None

Final Hearing Results

G214-06/07

AS

Code Change No: **G217-06/07**

Original Proposal

Sections: G102.1, G202.1, G901 (New)

Proponent: Rebecca C. Quinn, RCQuinn Consulting, Inc., representing the US Dept. of Homeland Security, Federal Emergency Management Agency

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THAT COMMITTEE.

1. Revise as follows:

G102.1 General. This appendix, in conjunction with the *International Building Code*, provides minimum requirements for development located in flood hazard areas, including the subdivision of land; installation of utilities; placement and replacement of manufactured homes; new construction and repair, reconstruction, rehabilitation or additions to new construction; substantial improvement of existing buildings and structures, including restoration after damage temporary structures and temporary or permanent storage, and certain building work exempt from permit under Section 105.2.

G201.2 Definitions.

DEVELOPMENT. Any man-made change to improved or unimproved real estate, including but not limited to, buildings or other structures, temporary structures, temporary or permanent storage of materials, mining, dredging, filling, grading, paving, excavations, operations and other land disturbing activities.

2. Add new text as follows:

G901 TEMPORARY STRUCTURES AND TEMPORARY STORAGE

G901.1 Temporary structures. Temporary structures shall be erected for a period of less than 180 days. Temporary structures shall be anchored to prevent flotation, collapse or lateral movement resulting from hydrostatic loads, including the effects of buoyancy, during conditions of the design flood. Fully enclosed temporary structures shall have flood openings to allow for the automatic entry and exit of flood waters.

G901.2 Temporary storage. Temporary storage includes storage of goods and materials for a period of less than 180 days. Stored materials shall not include hazardous materials.

G901.3 Floodway encroachment. Temporary structures and temporary storage in floodways shall meet the requirements of G103.5.

(Renumber subsequent section)

Reason: The purpose of this code change proposal is to add temporary structures and temporary storage of materials to the definition of development that is subject to the provisions of Appendix G which addresses flood hazard areas.

To be consistent with the regulations of the National Flood Insurance Program, which include a broad definition of development (44 C.F.R. §59.1), this code change adds temporary structures and temporary storage of materials to the definition of "development" in Appendix G. It also adds minimum requirements that apply to temporary structures and temporary storage of materials in flood hazard areas. Temporary structures are to be provided with flood openings and anchored to prevent flotation during the design flood so that they do not contribute to damage of downstream structures or blockage of bridges and culverts. Floodways are portions of riverine floodplains that are to be reserved to convey the base flood; placement of development in floodways may alter flood elevations and increase flood depths, contributing to increased damage. Prior to placement of temporary buildings or temporary storage of materials in floodways, the effect on floodways is to be considered as set forth in G103.5.

Temporary structures are addressed in the IBC (Section 107 and Section 3103). Appendix G addresses flood resistant provisions that, if adopted in conjunction with provisions of the IBC related to flood resistant design and construction offer an option for jurisdictions to satisfy the minimum requirements of the National Flood Insurance Program. Appendix G includes administrative provisions required by the NFIP and specific provisions for certain activities that are not within the scope of the IBC, including subdivisions, certain site development activities, manufactured homes, recreational vehicles, and tanks.

Bibliography: Federal regulations are available online.

Cost Impact: The code change proposal will not increase the cost of construction (more than 20,000 local jurisdictions already participate in the NFIP).

Public Hearing Results

Errata: Add comma in Section G102.1 as follows:

G102.1 General. This appendix, in conjunction with the *International Building Code*, provides minimum requirements for development located in flood hazard areas, including the subdivision of land; installation of utilities; placement and replacement of manufactured homes; new construction and repair, reconstruction, rehabilitation or additions to new construction; substantial improvement of existing buildings and structures, including restoration after damage, temporary structures and temporary or permanent storage, and certain building work exempt from permit under Section 105.2.

Committee Action:

Approved as Submitted

Committee Reason: The proposal adds requirements for temporary structures to the appendix that regulates development in flood hazard areas.

Assembly Action:

None

Final Hearing Results

G217-06/07

AS

Code Change No: G218-06/07

Original Proposal

Sections: G102.1, G901 (New)

Proponent: Rebecca C. Quinn, RCQuinn Consulting, Inc., representing the US Dept. of Homeland Security, and the Federal Emergency Management Agency

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THAT COMMITTEE.

1. Revise as follows:

G102.1 General. This appendix, in conjunction with the *International Building Code*, provides minimum requirements for development located in flood hazard areas, including the subdivision of land; installation of utilities; placement and replacement of manufactured homes; new construction and repair, reconstruction, rehabilitation or additions to new construction; substantial improvement of existing buildings and structures, including restoration after damage, utility and miscellaneous Group U buildings and structures, and certain building work exempt from permit under Section 105.2.

2. Add new text as follows:

G901
UTILITY AND MISCELLANEOUS GROUP U

G901.1 Utility and Miscellaneous Group U. Utility and Miscellaneous Group U includes buildings that are accessory in character and miscellaneous structures not classified in any specific occupancy in the *International Building Code*, including, but not limited to, agricultural buildings, aircraft hangars (accessory to a one- or two-family residence), barns, carports, fences more than 6 feet (1829 mm) high, grain silos (accessory to a residential occupancy), greenhouses, livestock shelters, private garages, retaining walls, sheds, stables, and towers.

G901.1 Flood loads. Utility and miscellaneous Group U buildings and structures, including substantial improvement of such buildings and structures, shall be anchored to prevent flotation, collapse or lateral movement resulting from flood loads, including the effects of buoyancy, during conditions of the design flood.

G901.2 Elevation. Utility and miscellaneous Group U buildings and structures, including substantial improvement of such buildings and structures, shall be elevated such that the lowest floor, including basement, is elevated to or above the design flood elevation in accordance with Section 1612 of the building code.

G901.4 Enclosures below design flood elevation. Fully enclosed areas below the design flood elevation shall be at or above grade on all sides and:

1. In flood hazard areas not subject to high velocity wave action, enclosed areas shall have flood openings to allow for the automatic inflow and outflow of floodwaters.
2. In flood hazard areas subject to high velocity wave action, enclosed areas shall have walls below the design flood elevation that are designed to break away or collapse from a water load less than that which would occur during the design flood, without causing collapse, displacement or other structural damage to the building or structure.

G901.5 Flood-damage resistant materials. Flood-damage resistant materials shall be used below the design flood elevation.

G901.6 Protection of mechanical, plumbing and electrical systems. Mechanical, plumbing and electrical systems, including plumbing fixtures, shall be elevated to or above the design flood elevation.

Exception: Electrical systems, equipment and components, and heating, ventilating, air conditioning, and plumbing appliances, plumbing fixtures, duct systems, and other service equipment shall be permitted to be located below the design flood elevation provided that they are designed and installed to prevent water from entering or accumulating within the components and to resist hydrostatic and hydrodynamic loads and stresses, including the effects of buoyancy, during the occurrence of flooding to the design flood elevation in compliance with the flood-resistant construction requirements of the *International Building Code*. Electrical wiring systems shall be permitted to be located below the design flood elevation provided they conform to the provisions of the *International Code Council Electrical Code Administrative Provisions*.

Reason: The purpose of this code change is to include in Appendix G the flood-resistant provisions that must be applied to buildings and structures that are listed in Section 312 in order to minimize damage during conditions of the design flood.

To be consistent with the regulations of the National Flood Insurance Program, which include a broad definition of development (44 C.F.R. §59.1) and includes all buildings and structures, this code change outlines flood-resistant provisions for utility and miscellaneous Group U buildings and structures. Section 312 of the IBC requires that "buildings and structures of an accessory character and miscellaneous structures not classified in any specific occupancy shall be constructed, equipped and maintained to conform to the requirements of this code commensurate with the fire and life hazard incidental to their occupancy." Flood resistance is appropriate in addition to fire and life safety and is required for consistency with the minimum requirements of the National Flood Insurance Program.

Appendix G addresses flood resistant provisions that, if adopted in conjunction with provisions of the IBC related to flood resistant design and construction offer an option for jurisdictions to satisfy the minimum requirements of the National Flood Insurance Program. Appendix G includes administrative provisions required by the NFIP and specific provisions for certain activities that are not within the scope of the IBC, including subdivisions, certain site development activities, manufactured homes, recreational vehicles, and tanks.

Bibliography: Federal regulations are available online.

Cost Impact: The code change proposal will not increase the cost of construction (more than 20,000 local jurisdictions already participate in the NFIP).

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The proposal adds requirements for group U structures to the appendix that regulates development in flood hazard areas.

Assembly Action:

None

Final Hearing Results

G218-06/07

AS

Code Change No: G219-06/07

Original Proposal

Section: G401.2

Proponent: Rebecca C. Quinn, RC Quinn Consulting, Inc., representing the U.S. Department of Homeland Security, and Federal Emergency Management Agency

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THAT COMMITTEE.

Revise as follows:

G401.2 Flood hazard areas subject to high velocity wave action. In flood hazard areas subject to high velocity wave action:

1. ~~Development or land-disturbing activity~~ New buildings and buildings that are substantially improved shall only be authorized landward of the reach of mean high tide.
2. The use of fill for structural support of buildings is prohibited.

Reason: The purpose of this code change is to correct the inadvertent inclusion of all development, specifically all structures, in the limitations on what may be authorized seaward of the reach of mean high tide.

Flood-related provisions in the IRC generally are consistent with the regulations of the National Flood Insurance Program (44 C.F.R. §60.3). As currently written, R324.3.1(1) requires that piers and other non-building structures be constructed landward of the reach of mean high tide. The federal regulations limit the placement of "new construction," as defined in those regulations, to landward of the reach of mean high tide. The NFIP definition of "new construction" is limited to new buildings and buildings that are substantially improved (i.e., buildings that are to be brought into conformance with the flood-resistant provisions).

The technical information used to substantiate this proposal is the NFIP regulation §60.3(e)(3).

Bibliography: No substantiating material submitted (federal regulations are available online)

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The proposal clarifies the limitation on what development may be authorized in flood hazard areas subject to high velocity wave action.

Assembly Action:

None

Final Hearing Results

G219-06/07

AS

Code Change No: **G220-06/07**

Original Proposal

Appendix K

Proponent: Maureen Traxler, City of Seattle, WA, Dept. of Planning & Development

Revise as follows:

CHAPTER K1 SCOPE

SECTION K101 GENERAL

~~**K101.1 Title.** These regulations shall be known as the *Electrical Code – Administrative Provisions* of [NAME OF JURISDICTION] and shall be cited as such and will be referred to herein as “this code.”~~

K101.2 K101.1 Purpose. The A purpose of this code is to ~~provide~~ establish minimum ~~standards~~ requirements to safeguard ~~life or limb,~~ public health, safety and general property and public welfare by regulating and controlling the design, construction, installation, quality of materials, location, operation, and maintenance or use of electrical systems and equipment.

~~**K101.3 K101.2 Scope.** This code shall regulate~~ applies to the design, construction, installation, alteration, repairs, relocation, replacement, addition to, use or maintenance of electrical systems and equipment.

SECTION K102 APPLICABILITY

K102.1 General. The provisions of this code ~~shall~~ apply to all matters affecting or relating to structures and premises, as set forth in Section K101.

~~**K102.1.1 K102.2 Existing installations.** Except as otherwise provided for in this chapter, a provision in this code shall not require the removal, alteration or abandonment of, nor prevent the continued utilization and maintenance of, existing electrical systems and equipment lawfully in existence at the time of the adoption of this code.~~

~~**K102.1.2 K102.3 Maintenance.** Electrical systems, equipment, materials and appurtenances, both existing and new, and parts thereof shall be maintained in proper operating condition in accordance with the original design and in a safe, hazard-free condition. Devices or safeguards that are required by this code shall be maintained in compliance with the code edition under which installed. The owner or the owner’s designated agent shall be responsible for the maintenance of the electrical systems and equipment. To determine compliance with this provision, the ~~code~~ building official shall have the authority to require that the electrical systems and equipment be reinspected.~~

~~**K102.1.3 K102.4 Additions, alterations and repairs.** Additions, alterations, renovations and repairs to electrical systems and equipment shall conform to that required for new electrical systems and equipment without requiring that the existing electrical systems or equipment comply with all of the requirements of this code. Additions, alterations and repairs shall not cause existing electrical systems or equipment to become unsafe, hazardous or overloaded.~~

Minor additions, alterations, renovations and repairs to existing electrical systems and equipment shall meet the provisions for new construction, except where such work is performed in the same manner and arrangement as was in the existing system, is not hazardous and is approved.

~~**K102.1.4 Change in occupancy.** It shall be unlawful to make a change in the occupancy of any structure that will subject the structure to any special provision of this code applicable to the new occupancy without approval. The code official shall certify that such structure meets the intent of the provisions of law governing building construction for the proposed new occupancy and that such change of occupancy does not result in any hazard to public health, safety or welfare.~~

~~**K102.1.5 Moved buildings.** Electrical systems and equipment that are a part of buildings or structures moved into or within the jurisdiction shall comply with the provisions of this code for new installations.~~

~~**K102.2 Differences.** Where, in any specific case, different sections of this code specify different materials, methods of construction or other requirements, the most restrictive shall govern. Where there is a conflict between a general requirement and a specific requirement, the specific requirement shall be applicable.~~

~~**K102.3 Other laws.** The provisions of this code shall not be deemed to nullify any provisions of local, state or federal law.~~

~~**K102.4 Validity.** In the event any part or provision of this code is held to be illegal or void, this shall not have the effect of making void or illegal any of the other parts or provisions thereof, which are determined to be legal; and it shall be presumed that this code would have been adopted without such illegal or invalid parts or provisions.~~

~~**K102.4.1 Segregation of invalid provisions.** Any invalid part of this code shall be segregated from the remainder of this code by the court holding such part invalid, and the remainder shall remain effective.~~

~~**K102.5 Application of references.** References to chapter or section numbers, or to provisions not specifically identified by number, shall be construed to refer to such chapters, sections or provisions of this code.~~

~~**K102.6 Referenced codes and standards.** The codes and standards referenced in this code shall be those that are listed in Chapter K13 and such codes and standards shall be considered part of the requirements of this code to the prescribed extent of each such reference. Where differences occur between provisions of this code and referenced codes or standards, the provisions of this code shall apply.~~

~~**Exception:** Where enforcement of a code provision would violate the conditions of the listing of the equipment or appliance, the conditions of the listing and manufacturer's instructions shall apply.~~

~~**K102.7 Appendices.** Provisions in the appendices shall not apply unless specifically referenced in the adopting ordinance.~~

~~**K102.8 K102.5 Subjects not regulated by this code.** Where no applicable standards or requirements are set forth in this code, or are contained within other laws, codes, regulations, ordinances or bylaws adopted by the jurisdiction, compliance with applicable standards of nationally recognized standards as are approved shall be deemed as prima facie evidence of compliance with the intent of this code. Nothing herein shall derogate from the authority of the ~~code~~ building official to determine compliance with codes or standards for those activities or installations within the ~~code~~ building official's jurisdiction or responsibility.~~

CHAPTER K2 DEFINITIONS

SECTION K201 GENERAL

~~**K201.1 Scope.** Unless otherwise expressly stated, the following words and terms shall, for the purposes of this code, have the meanings indicated in this chapter.~~

~~**K201.2 Interchangeability.** Words used in the present tense include the future; words in the masculine gender include the feminine and neuter; the singular number includes the plural and the plural, the singular.~~

~~**K201.3 Terms defined in other codes.** Where terms are not defined in this code and are defined in the *International Building Code, International Energy Conservation Code, International Fire Code, International Fuel Gas Code, International Mechanical Code, International Plumbing Code, International Private Sewage Disposal Code, International Property Maintenance Code, International Residential Code, International Zoning Code* or NFPA 70, such terms shall have meanings ascribed to them as in those codes.~~

~~**K201.4 Terms not defined.** Where terms are not defined through the methods authorized by this section, such terms shall have ordinarily accepted meanings such as the context implies.~~

SECTION K202 GENERAL DEFINITIONS

APPROVED. Approved by the code official or other authority having jurisdiction.

APPROVED AGENCY. An established and recognized agency regularly engaged in conducting tests or furnishing inspection services, where the agency has been approved by the code official.

CODE OFFICIAL. The officer or other designated authority charged with the administration and enforcement of this code, or a duly authorized representative.

LISTED AND LISTING. Equipment, appliances or materials included in a list published by a nationally recognized testing laboratory, inspection agency or other organization concerned with product evaluation that maintains periodic inspection of the production of listed equipment, appliances or materials, and whose listing states either that the equipment, appliances or materials meet nationally recognized standards, or has been tested and found suitable for use in a specified manner. Not all testing laboratories, inspection agencies and other organizations concerned with product evaluation use the same means for identifying listed equipment, appliances or materials. Some do not recognize equipment, appliances or materials as listed unless they are also labeled. The authority having jurisdiction shall utilize the system employed by the listing organization to identify a listed product.

OCCUPANCY. The purpose for which a building, or part thereof, is utilized or occupied.

CHAPTER K3 ORGANIZATION AND ENFORCEMENT

SECTION K301 DEPARTMENT OF ELECTRICAL INSPECTION

K301.1 Creation of enforcement agency. The department of electrical inspection is hereby created and the official in charge thereof shall be known as the code official. The function of the department shall be to assist the code official in the administration and enforcement of the provisions of this code.

K301.2 Appointment. The code official shall be appointed by the chief appointing authority of the jurisdiction.

K301.3 Deputies. In accordance with the prescribed procedures of this jurisdiction and with the concurrence of the appointing authority, the code official shall have the authority to appoint a deputy code official, the related technical officers, inspectors, plans examiners and other employees. Such employees shall have powers as delegated by the code official.

SECTION K302 DUTIES AND POWERS OF THE CODE OFFICIAL

K302.1 General. The code official is hereby authorized and directed to enforce the provisions of this code. The code official shall have the authority to render interpretations of this code, and to adopt policies, procedures, rules and regulations in order to clarify the application of its provisions. Such interpretations, policies, procedures, rules and regulations shall be in compliance with the intent and purpose of this code. Such policies and procedures shall not have the effect of waiving requirements specifically provided for in this code.

K302.2 Rule-making authority. The code official shall have authority as necessary in the interest of public health, safety and general welfare, to adopt and promulgate rules and regulations and to designate requirements applicable because of local climatic or other conditions. Such rules shall not have the effect of waiving requirements specifically provided for in this code, or of violating accepted engineering methods involving public safety.

K302.3 Applications and permits. The code official is authorized to receive applications, review construction documents and issue permits for the installation of electrical systems and equipment, inspect the premises for which such permits have been issued, and enforce compliance with the provisions of this code.

K302.4 Notices and orders. The code official is authorized to issue all necessary notices or orders in accordance with Chapter K10 as are required to effect compliance with this code.

~~**K302.5 Inspections.** The code official shall make all of the inspections necessary to determine compliance with the provisions of this code in accordance with Chapter K7.~~

~~**K302.6 Identification.** The code official shall carry proper identification as required by Section K702.4.1.~~

~~**K302.7 Right of entry.** The code official is authorized to enter the structure or premises at reasonable times to inspect or perform the duties imposed by this code in accordance with Section K702.4.~~

~~**K302.8 Department records.** The code official shall keep official records of applications received, permits and certificates issued, fees collected, reports of inspections, notices and orders issued, and as required by this code, such records shall be retained in the official records for the period required for retention of public records.~~

~~**K302.8.1 Approvals and modifications.** A record of approvals and modifications granted shall be maintained by the code official and shall be available for public inspection during business hours in accordance with applicable laws.~~

~~**K302.8.2 Inspections.** The code official shall keep a record of each inspection made, including notices and orders issued, showing the findings and disposition of each.~~

~~**K302.8.3 Alternative methods or materials.** The application for modification, alternative methods or materials, and the final decision of the code official shall be in writing and shall be officially recorded in the permanent records of the code official.~~

~~**K302.9 Liability.** The code official, officer or employee charged with the enforcement of this code, while acting for the jurisdiction in good faith and without malice in the discharge of the duties required by this code or other pertinent law or ordinance, shall not thereby be rendered liable personally, and is hereby relieved from all personal liability for any damage accruing to persons or property as a result of any act or by reason of an act or omission in the discharge of official duties. Any suit instituted against any officer or employee because of an act performed by that officer or employee in the lawful discharge of duties and under the provisions of this code shall be defended by the legal representative of the jurisdiction until the final termination of the proceedings.~~

~~The code official or any subordinate shall not be liable for costs in any action, suit or proceeding that is instituted in pursuance of the provisions of this code; and any official, officer or employee, acting in good faith and without malice, shall be free from liability for acts performed under any of its provisions or by reason of any act or omission in the performance of official duties in connection therewith.~~

SECTION K303 CERTIFICATE OF OCCUPANCY

~~**K303.1 Use and occupancy.** No building or structure shall be used or occupied until a certificate of occupancy has been provided in accordance with the *International Building Code*.~~

CHAPTER K4 SECTION K 103 PERMITS AND FEES

SECTION K401 GENERAL

~~**K401.1 Permits required.** Permits required by this code shall be obtained from the code official. Permit fees, if any, shall be paid prior to issuance of the permit. Issued permits shall be kept on the premises designated therein at all times and shall be readily available for inspection by the code official.~~

~~**K401.2 K103.1 Types of permits.** An owner, authorized agent or contractor who desires to construct, enlarge, alter, repair, move, demolish or change the occupancy of a building or structure, or to erect, install, enlarge, alter, repair, remove, convert or replace electrical systems or equipment, the installation of which is regulated by this code, or to cause such work to be done, shall first make application to the code building official and obtain the required permit for the work.~~

Exception: Where repair or replacement of electrical systems or equipment must be performed in an emergency situation, the permit application shall be submitted within the next working business day of the department of electrical inspection.

K401.3 K103.2 Work exempt from permit. The following work shall be exempt from the requirement for a permit:

1. Listed cord and plug connected temporary decorative lighting.
2. Reinstallation of attachment plug receptacles, but not the outlets therefor.
3. Repair or replacement of branch circuit over current devices of the required capacity in the same location.
4. Temporary wiring for experimental purposes in suitable experimental laboratories.
5. Electrical wiring, devices, appliances, apparatus or equipment operating at less than 25 volts and not capable of supplying more than 50 watts of energy. Exemption from the permit requirements of this code shall not be deemed to grant authorization for work to be done in violation of the provisions of this code or other laws or ordinances of this jurisdiction.

SECTION K402 APPLICATION

K402.1 General. The code official is authorized to receive applications for and issue permits as required by this code.

K402.2 Application. Application for a permit required by this code shall be made to the code official in such form and detail as prescribed by the code official. Applications for permits shall be accompanied by such plans as prescribed by the code official.

K402.3 Action on application. The code official shall examine or cause to be examined applications for permits and amendments thereto within a reasonable time after filing. If the application or the construction documents do not conform to the requirements of pertinent laws, the code official shall reject such application in writing, stating the reasons therefor. If the code official is satisfied that the proposed work conforms to the requirements of this code and laws and ordinances applicable thereto, the code official shall issue a permit therefor as soon as practicable.

K402.4 Inspection required. Before a permit is issued, the code official is authorized to inspect and approve the systems, equipment, buildings, devices, premises, and spaces or areas to be used.

K402.5 Time limitation of application. An application for a permit for any proposed work or operation shall be deemed to have been abandoned 180 days after the date of filing, unless such application has been pursued in good faith or a permit has been issued; except that the code official is authorized to grant one or more extensions of time for additional periods not exceeding 90 days each. The extension shall be requested in writing and justifiable cause demonstrated.

SECTION K403 CONDITIONS

K403.1 Conditions of a permit. A permit shall constitute permission to conduct work as set forth in this code in accordance with the provisions of this code. Such permission shall not be construed as authority to violate, cancel or set aside any of the provisions of this code or other applicable regulations or laws of the jurisdiction.

K403.2 Expiration. Every permit issued shall become invalid unless the work on the site authorized by such permit is commenced within 180 days after its issuance, or if the work authorized on the site by such permit is suspended or abandoned for a period of 180 days after the time the work is commenced. The code official is authorized to grant, in writing, one or more extensions of time, for periods not more than 180 days each. The extension shall be requested in writing and justifiable cause demonstrated.

K403.3 Extensions. The code official is authorized to grant, in writing, one or more extensions of the time period of a permit for periods of not more than 90 days each. Such extensions shall be requested by the permit holder in writing and justifiable cause demonstrated.

K403.4 Posting the permit. Issued permits shall be kept on the premises designated therein at all times and shall be readily available for inspection by the code official.

K403.5 Validity. The issuance or granting of a permit shall not be construed to be a permit for, or an approval of, any violation of any of the provisions of this code or of any other ordinance of the jurisdiction. Permits presuming to give authority to violate or cancel the provisions of this code or other ordinances of the jurisdiction shall not be valid. The issuance of a permit based on construction documents and other data shall not prevent the code official from requiring the correction of errors in the construction documents and other data. The code official is also authorized to prevent occupancy or use of a structure where in violation of this code or of any other ordinances of this jurisdiction.

K403.6 Information on the permit. The code official shall issue all permits required by this code on an approved form furnished for that purpose. The permit shall contain a general description of the operation or occupancy and its location and any other information required by the code official. Issued permits shall bear the signature of the code official.

K403.7 Suspension or revocation. The code official is authorized to suspend or revoke a permit issued under the provisions of this code wherever the permit is issued in error, on the basis of incorrect, inaccurate or incomplete information; in violation of any ordinance, regulation or any of the provisions of this code; or if any one of the following conditions exist:

1. The permit is used for a location or establishment other than that for which it was issued.
2. The permit is used for a condition or activity other than that listed in the permit.
3. Conditions and limitations set forth in the permit have been violated.
4. There have been any false statements or misrepresentations as to the material fact in the application for permit or plans submitted or a condition of the permit.
5. The permit is used by a different person or firm than the name for which it was issued.
6. The permittee failed, refused or neglected to comply with orders or notices duly served in accordance with the provisions of this code within the time provided therein.
7. The permit was issued in error or in violation of an ordinance, regulation or this code.

SECTION K404 FEES

K404.1 Payment of fees. A permit shall not be valid until the fees prescribed by law have been paid. Nor shall an amendment to a permit be released until the additional fee, if any, has been paid.

K404.2 Schedule of permit fees. A fee for each permit shall be paid as required, in accordance with the schedule as established by the applicable governing authority. The fees for electrical work shall be as indicated in the following schedule. [JURISDICTION TO INSERT APPROPRIATE SCHEDULE]

K404.3 Work commencing before permit issuance. Any person who commences any work before obtaining the necessary permits shall be subject to an additional fee established by the code official, which shall be in addition to the required permit fees.

K404.4 Related fees. The payment of the fee for the construction, alteration, removal or demolition for work done in connection with, or concurrently with, the work authorized by a permit shall not relieve the applicant or holder of the permit from the payment of other fees that are prescribed by law.

K404.5 Refunds. The code official is authorized to establish a refund policy.

CHAPTER K5 SECTION K104 CONSTRUCTION DOCUMENTS

SECTION K501 GENERAL

K501.1 Submittal documents. Construction documents, special inspection and structural observation programs, and other data shall be submitted in one or more sets with each application for a permit. The construction documents shall be prepared by a registered design professional where required by the statutes of the jurisdiction in which the project is to be constructed. Where special conditions exist, the code official is authorized to require additional construction documents to be prepared by a registered design professional.

Exception: The code official is authorized to waive the submission of construction documents and other data not required to be prepared by a registered design professional if it is found that the nature of the work applied for is such that reviewing of construction documents is not necessary to determine compliance with this code.

K501.2 K104.1 Information on construction documents. Construction documents shall be drawn to scale upon suitable material. Electronic media documents are permitted to be submitted where approved by the code building official. Construction documents shall be of sufficient clarity to indicate the location, nature and extent of the work proposed and show in detail that it will conform to the provisions of this code and relevant laws, ordinances, rules and regulations, as determined by the code building official.

~~K501.2.1~~ K104.2 Penetrations. Construction documents shall indicate where penetrations will be made for electrical systems and shall indicate the materials and methods for maintaining required structural safety, fire-resistance rating and fireblocking.

~~K501.2.2~~ K104.3 Load calculations. Where an addition or alteration is made to an existing electrical system, an electrical load calculation shall be prepared to determine if the existing electrical service has the capacity to serve the added load.

~~K501.3~~ Site plan. The construction documents submitted with the application for permit shall be accompanied by a site plan showing to scale the size and location of new construction and existing structures on the site, distances from lot lines, the established street grades and the proposed finished grades; and it shall be drawn in accordance with an accurate boundary line survey. In the case of demolition, the site plan shall show construction to be demolished and the location and size of existing structures and construction that are to remain on the site or plot. The code official is permitted to waive or modify the requirement for a site plan where the application for permit is for alteration or repair or where otherwise warranted.

SECTION K502 EXAMINATION OF DOCUMENTS

~~K502.1~~ General. The code official shall examine or cause to be examined the accompanying construction documents and shall ascertain by such examinations whether the construction indicated and described is in accordance with the requirements of this code and other pertinent laws or ordinances.

~~K502.2~~ Approval of construction documents. When the code official issues a permit, the construction documents shall be approved, in writing or by stamp, as "Reviewed for Code Compliance." One set of construction documents so reviewed shall be retained by the code official. The other set shall be returned to the applicant, shall be kept at the site of work and shall be open to inspection by the code official or the authorized representative.

~~K502.2.1~~ Previous approvals. This code shall not require changes in the construction documents, construction or installation of electrical systems or equipment for which a lawful permit has been heretofore issued or otherwise lawfully authorized, and the construction of which has been pursued in good faith within 180 days after the effective date of this code and has not been abandoned.

~~K502.2.2~~ Phased approval. The code official is authorized to issue a permit for the installation of part of an electrical system before the construction documents for the electrical system have been submitted, provided that adequate information and detailed statements have been filed complying with pertinent requirements of this code. The holder of such permit shall proceed at the holder's own risk with the building operation and without assurance that a permit for the entire system will be granted.

SECTION K503 DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE

~~K503.1~~ General. Where it is required that documents be prepared by a registered design professional, the code official shall require the owner to engage and designate on the permit application a registered design professional who shall act as the registered design professional in responsible charge. If the circumstances require, the owner shall be permitted to designate a substitute registered design professional in responsible charge who shall perform the duties required of the original registered design professional in responsible charge. The code official shall be notified in writing by the owner if the registered design professional in responsible charge is changed or is unable to perform the duties. The registered design professional in responsible charge shall be responsible for reviewing and coordinating submittal documents prepared by others, including phased and deferred submittal items, for compatibility with the design of the system.

SECTION K504 HANDLING SUBMITTALS

~~K504.1~~ Deferred submittals. For the purposes of this section, deferred submittals are defined as those portions of the design that are not submitted at the time of the application and that are to be submitted to the code official within a specified period. Deferral of any submittal items shall have the prior approval of the code official. The registered design professional in responsible charge shall list the deferred submittals on the construction documents for review

by the code official. Submittal documents for deferred submittal items shall be submitted to the registered design professional in responsible charge, who shall review them and forward them to the code official with a notation indicating that the deferred submittal documents have been reviewed and that they have been found to be in general compliance with the design of the system. The deferred submittal items shall not be installed until their design and submittal documents have been approved by the code official.

K504.2 Amended construction documents. Work shall be installed in accordance with the reviewed construction documents, and any changes made during construction which are not in compliance with the approved construction documents shall be resubmitted for approval as an amended set of construction documents.

K504.3 Retention of construction documents. One set of approved construction documents shall be retained by the code official for a period of not less than 180 days from date of completion of the permitted work, or as required by state or local laws.

CHAPTER K6 APPROVAL

SECTION K601 GENERAL

K601.1 Approved materials and equipment. All materials, equipment and devices approved by the code official shall be constructed and installed in accordance with such approval.

K601.1.1 Technical assistance. To determine the acceptability of technologies, processes, products, facilities, materials and uses attending the design, operation or use of a building or premises subject to the inspection of the department, the code official is authorized to require the owner or the person in possession or control of the building or premises to provide, without charge to the jurisdiction, a technical opinion and report. The opinion and report shall be prepared by a qualified engineer, specialist, laboratory or organization acceptable to the code official and shall analyze the properties of the design, operation or use of the building or premises and the facilities and appurtenances situated thereon, to recommend necessary changes. The code official is authorized to require design submittals to be prepared by and bear the stamp of, a registered design professional.

K601.2 Modifications. Wherever there are practical difficulties involved in carrying out the provisions of this code, the code official shall have the authority to grant modifications for individual cases, provided the code official shall first find that special individual reason makes the strict letter of this code impractical and that the modification is in compliance with the intent and purpose of this code, and that such modification does not lessen health, life and fire-safety requirements. The details of action granting modifications shall be recorded and entered in the files of the department of electrical inspection.

K601.3 Alternative materials, methods, equipment and appliances. The provisions of this code are not intended to prevent the installation of any material or to prohibit any method of construction not specifically prescribed by this code, provided that any such alternative has been approved. An alternative material or method of construction shall be approved where the code official finds that the proposed design is satisfactory and complies with the intent of the provisions of this code, and that the material, method or work offered is, for the purpose intended, at least the equivalent of that prescribed in this code in quality, strength, effectiveness, fire resistance, durability and safety.

K601.4 Material, equipment and appliance reuse. Materials, equipment, appliances and devices shall not be reused unless such elements have been reconditioned, tested and placed in good and proper working condition and approved.

SECTION K602 TESTING

K602.1 Required testing. Wherever there is insufficient evidence of compliance with the provisions of this code, or evidence that a material or method does not conform to the requirements of this code, or in order to substantiate claims for alternative materials or methods, the code official shall have the authority to require tests as evidence of compliance to be made at no expense to the jurisdiction.

K602.2 Test methods. Test methods shall be as specified in this code or by other recognized test standards. In the absence of recognized and accepted test methods, the code official shall approve the testing procedures.

~~**K602.3 Testing agency.** All tests shall be performed by an approved agency.~~

~~**K602.4 Test reports.** Reports of tests shall be retained by the code official for the period required for retention of public records.~~

SECTION K603 K105 ALTERNATIVE ENGINEERED DESIGN

~~**K603.1 K105.1 General.** The design, documentation, inspection, testing and approval of an alternative engineered design electrical system shall comply with this section.~~

~~**K603.2 K105.2 Design criteria.** An alternative engineered design shall conform to the intent of the provisions of this code and shall provide an equivalent level of quality, strength, effectiveness, fire resistance, durability and safety. Materials, equipment or components shall be designed and installed in accordance with the manufacturer's installation instructions.~~

~~**K603.3 K105.3 Submittal.** The registered design professional shall indicate on the permit application that the electrical system is an alternative engineered design. The permit and permanent permit records shall indicate that an alternative engineered design was part of the approved installation.~~

~~**K603.4 K105.4 Technical data.** The registered design professional shall submit sufficient technical data to substantiate the proposed alternative engineered design and to prove that the performance meets the intent of this code.~~

~~**K603.5 K105.5 Construction documents.** The registered design professional shall submit to the ~~code~~ building official two complete sets of signed and sealed construction documents for the alternative engineered design. The construction documents shall include floor plans and a diagram of the work.~~

~~**K603.6 K105.6 Design approval.** Where the ~~code~~ building official determines that the alternative engineered design conforms to the intent of this code, the electrical system shall be approved. If the alternative engineered design is not approved, the ~~code~~ building official shall notify the registered design professional in writing, stating the reasons therefor.~~

~~**K603.7 K105.7 Inspection and testing.** The alternative engineered design shall be tested and inspected in accordance with the requirements of this code.~~

CHAPTER K7 INSPECTIONS AND TESTING

SECTION K701 GENERAL

~~**K701.1 General.** The code official is authorized to conduct inspections that are deemed necessary to determine the extent of compliance with the provisions of this code and to approve reports of inspection by approved agencies or individuals. All reports of such inspections shall be prepared and submitted in writing for review and approval. Inspection reports shall be certified by a responsible officer of such approved agency or by the responsible individual. The code official is authorized to engage such expert opinion as deemed necessary to report upon unusual, detailed or complex technical issues subject to the approval of the governing body.~~

SECTION K702 K106 REQUIRED INSPECTIONS

~~**K702.1 K106.1 General.** The ~~code~~ building official, upon notification, shall make the inspections set forth in this section.~~

~~**K702.1.1 Evaluation and follow-up inspection services.** Prior to the approval of a prefabricated construction assembly having concealed electrical work and the issuance of an electrical permit, the code official shall require the submittal of an evaluation report on each prefabricated construction assembly, indicating the complete details of the electrical system, including a description of the system and its components, the basis upon which the system is being evaluated, test results and similar information, and other data as necessary for the code official to determine conformance to this code.~~

~~**K702.1.1.1 Evaluation service.** The code official shall designate the evaluation service of an approved agency as the evaluation agency, and review such agency's evaluation report for adequacy and conformance to this code.~~

~~**K702.1.1.2 Follow-up inspection.** Except where ready access is provided to electrical systems, service equipment and accessories for complete inspection at the site without disassembly or dismantling, the code official shall conduct the in-plant inspections as frequently as necessary to ensure conformance to the approved evaluation report or shall designate an independent, approved inspection agency to conduct such inspections. The inspection agency shall furnish the code official with the follow-up inspection manual and a report of inspections upon request, and the electrical system shall have an identifying label permanently affixed to the system indicating that factory inspections have been performed.~~

~~**K702.1.1.3 Test and inspection records.** Required test and inspection records shall be available to the code official at all times during the fabrication of the electrical system and the erection of the building; or such records as the code official designates shall be filed.~~

~~**K702.1.2 Concealed work.** Work shall remain accessible and exposed for inspection purposes until approved. It shall be the duty of the permit applicant to cause the work to remain accessible and exposed for inspection purposes. Wherever any installation subject to inspection prior to use is covered or concealed without having first been inspected, the code official shall have the authority to require that such work be exposed for inspection. Neither the code official nor the jurisdiction shall be liable for expense entailed in the removal or replacement of any material required to allow inspection.~~

~~**K702.1.3 K106.2 Underground.** Underground inspection shall be made after trenches or ditches are excavated and bedded, piping and conductors installed, and before backfill is put in place. Where excavated soil contains rocks, broken concrete, frozen chunks and other rubble that would damage or break the raceway, cable or conductors, or where corrosive action will occur, protection shall be provided in the form of granular or selected material, approved running boards, sleeves or other means.~~

~~**K702.1.4 K106.3 Rough-in.** Rough-in inspection shall be made after the roof, framing, fireblocking and bracing are in place and all wiring and other components to be concealed are complete, and prior to the installation of wall or ceiling membranes.~~

~~**K702.1.5 Other inspections.** In addition to the inspections specified above, the code official is authorized to make or require other inspections of any construction work to ascertain compliance with the provisions of this code and other laws, which are enforced by the department of electrical inspection.~~

~~**K702.1.6 Final inspection.** The final inspection shall be made after all work required by the permit is completed.~~

~~**K702.1.7 Inspection record card.** Work requiring a permit shall not be commenced until the permit holder or an agent of the permit holder shall have posted or otherwise made available an inspection record card such as to allow the code official to make conveniently the required entries thereon regarding inspection of the work. This card shall be maintained by the permit holder until final approval has been granted by the code official.~~

~~**K702.1.8 Approval required.** Work shall not be performed beyond the point indicated in each successive inspection and test without first obtaining the approval of the code official. The code official, upon notification, shall make the requested inspections and tests and shall either indicate the portion of the construction that is satisfactory as completed, or shall notify the permit holder or an agent of the permit holder wherein the same fails to comply with this code. Any portions that do not comply shall be corrected and such portion shall not be covered or concealed until authorized by the code official.~~

~~**K702.2 Validity.** Approval as a result of an inspection shall not be construed to be an approval of a violation of the provisions of this code or of other ordinances of the jurisdiction. Inspections presuming to give authority to violate or cancel the provisions of this code or of other ordinances of the jurisdiction shall not be valid.~~

~~**K702.3 Preliminary inspection.** Before issuing a permit, the code official is authorized to examine or cause to be examined buildings, structures and sites for which an application has been filed. The code official shall be notified when the installation is ready for inspection and is authorized to conduct the inspection within a reasonable period of time.~~

~~**K702.4 Entry.** The code official is authorized to enter and examine any building, structure, marine vessel, vehicle or premises in accordance with Section K702.4.3 for the purpose of enforcing this code.~~

~~**K702.4.1 Identification.** The code official shall carry proper identification issued by the governing authority where inspecting structures, premises or facilities in the performance of duties under this code and shall be identified by proper credentials issued by this governing authority.~~

~~**K702.4.2 Impersonation prohibited.** A person shall not impersonate the code official through the use of a uniform, identification card, badge or any other means.~~

~~**K702.4.3 Right of entry.** Where it is necessary to make an inspection to enforce the provisions of this code, or where the code official has reasonable cause to believe that there exists in a structure or upon any premises a condition that is contrary to or in violation of this code, which makes the structure or premises unsafe, dangerous or hazardous, the code official is authorized to enter the structure or premises at reasonable times to inspect or to perform the duties imposed by this code, provided that if such structure or premises be occupied, that credentials be presented to the occupant and entry requested. If such structure or premises is unoccupied, the code official is authorized to first make a reasonable effort to locate the owner or other person having charge or control of the structure or premises and request entry. If entry is refused, the code official shall have recourse to the remedies provided by law to secure entry.~~

~~**K702.5 Inspection agencies.** The code official is authorized to accept reports of approved inspection agencies, provided such agencies satisfy the requirements as to qualifications and reliability.~~

~~**K702.6 Inspection requests.** It shall be the duty of the person doing the work authorized by a permit to notify the code official that such work is ready for inspection. It shall be the duty of the person requesting any inspections required by this code to provide access to and means for inspection of such work.~~

~~**K702.7 Assistance from other agencies.** The assistance and cooperation of police, building, fire and health department officials and all other officials shall be available as required in the performance of duties.~~

~~**K702.8 K106.4 Contractors' responsibilities.** It shall be the responsibility of every contractor who enters into contracts for the installation or repair of electrical systems for which a permit is required to comply with adopted state and local rules and regulations concerning licensing.~~

SECTION K107 **PREFABRICATED CONSTRUCTION**

K107 Prefabricated construction. Prefabricated construction is subject to Sections K107.1 through K107.4.

K107.1 Evaluation and follow-up inspection services. Prior to the approval of a prefabricated construction assembly having concealed electrical work and the issuance of an electrical permit, the building official shall require the submittal of an evaluation report on each prefabricated construction assembly, indicating the complete details of the electrical system, including a description of the system and its components, the basis upon which the system is being evaluated, test results and similar information, and other data as necessary for the code official to determine conformance to this code.

K107.2 Evaluation service. The building official shall designate the evaluation service of an approved agency as the evaluation agency, and review such agency's evaluation report for adequacy and conformance to this code.

K107.3 Follow-up inspection. Except where ready access is provided to electrical systems, service equipment and accessories for complete inspection at the site without disassembly or dismantling, the building official shall conduct the in-plant inspections as frequently as necessary to ensure conformance to the approved evaluation report or shall designate an independent, approved inspection agency to conduct such inspections. The inspection agency shall furnish the building official with the follow-up inspection manual and a report of inspections upon request, and the electrical system shall have an identifying label permanently affixed to the system indicating that factory inspections have been performed.

K107.4 Test and inspection records. Required test and inspection records shall be available to the building official at all times during the fabrication of the electrical system and the erection of the building; or such records as the building official designates shall be filed.

SECTION K703 **TESTING**

~~**K703.1 General.**~~ **K107.5 Testing.** Electrical work shall be tested as required in this code. Tests shall be performed by the permit holder and observed by the code official.

~~**K703.2 K107.5.1 Apparatus, material and labor for tests.** Apparatus, material and labor required for testing an electrical system or part thereof shall be furnished by the permit holder.~~

~~**K703.3 K107.5.2 Reinspection and testing.** Where any work or installation does not pass an initial test or inspection, the necessary corrections shall be made so as to achieve compliance with this code. The work or installation shall then be resubmitted to the code official for inspection and testing.~~

**CHAPTER K8
SERVICE UTILITIES**

**SECTION K801
GENERAL**

~~**K801.1 Connection of service utilities.** No person shall make connections from a utility, source of energy, fuel or power to any building or system that is regulated by this code for which a permit is required, until released by the code official.~~

~~**K801.2 Temporary connection.** The code official shall have the authority to authorize the temporary connection of the building or system to the utility source of energy, fuel or power.~~

~~**K801.3 Authority to disconnect service utilities.** The code official shall have the authority to authorize disconnection of utility services or energy sources to the building, structure or system regulated by this code in case of an emergency where it is necessary to eliminate an immediate hazard to life or property. The code official shall notify the serving utility and, wherever possible, the owner and occupant of the building, structure or service system of the decision to disconnect prior to taking such action. If not notified prior to disconnecting, the owner or occupant of the building, structure or service system shall be notified in writing as soon as practical thereafter.~~

SECTION K108
RECONNECTION

~~**K801.3.1 K108.1 Connection after order to disconnect.** A person shall not make utility service or energy source connections to systems regulated by this code, which have been disconnected or ordered to be disconnected by the code building official, or the use of which has been ordered to be discontinued by the code building official until the code building official authorizes the reconnection and use of such systems.~~

**CHAPTER K9
UNSAFE SYSTEMS AND EQUIPMENT**

**SECTION K901
CONDITIONS**

~~**K901.1 Unsafe electrical systems.** An electrical system that is unsafe, constitutes a fire or health hazard, or is otherwise dangerous to human life, as regulated by this code, is hereby declared as an unsafe electrical system. Use of an electrical system regulated by this code constituting a hazard to health, safety or welfare by reason of inadequate maintenance, dilapidation, fire hazard, disaster, damage or abandonment is hereby declared an unsafe use. Such unsafe equipment and appliances are hereby declared to be a public nuisance and shall be abated by repair, rehabilitation, demolition or removal.~~

SECTION K109
CONDEMNING ELECTRICAL SYSTEMS

~~**K901.2 K109.1 Authority to condemn electrical systems.** Wherever the code building official determines that any electrical system, or portion thereof, regulated by this code has become hazardous to life, health or property, the code building official shall order in writing that such electrical systems either be removed or restored to a safe condition. A time limit for compliance with such order shall be specified in the written notice. A person shall not use or maintain a defective electrical system or equipment after receiving such notice.~~

~~Where such electrical system is to be disconnected, written notice as prescribed in this code shall be given. In cases of immediate danger to life or property, such disconnection shall be made immediately without such notice.~~

~~**K901.3 Dangerous conditions.** Wherever the code official shall find in any structure or upon any premises dangerous or hazardous conditions or materials, the code official is authorized to order such dangerous conditions or materials to be removed or remedied in accordance with the provisions of this code.~~

~~**K901.4 Record.** The code official shall cause a report to be filed on an unsafe condition. The report shall state the occupancy of the structure and the nature of the unsafe condition.~~

~~**K901.5 Notice.** If an unsafe condition is found, the code official shall serve on the owner, agent or person in control of the structure, a written notice that describes the condition deemed unsafe and specifies the required repairs or improvements to be made to abate the unsafe condition, or that requires the unsafe condition to be removed within a stipulated time. Such notice shall require the person thus notified to declare immediately to the code official acceptance or rejection of the terms of the order.~~

~~**K901.6 Method of service.** Such notice shall be deemed properly served if a copy thereof is: (a) delivered to the owner personally; or (b) sent by certified or registered mail addressed to the owner at the last known address with the return receipt requested. If the certified or registered letter is returned showing that the letter was not delivered, a copy thereof shall be posted in a conspicuous place in or about the structure affected by such notice. Service of such notice in the foregoing manner upon the owner's agent or upon the person responsible for the structure shall constitute service of notice upon the owner.~~

CHAPTER K10 VIOLATIONS

SECTION K1001 UNLAWFUL ACTS

~~**K1001.1 General.** It shall be unlawful for any person, firm or corporation to erect, construct, alter, extend, repair, move, remove, demolish or occupy any system or equipment regulated by this code, or cause same to be done, in conflict with or in violation of any of the provisions of this code.~~

SECTION K1002 NOTICE OF VIOLATION

~~**K1002.1 Issuance.** Where the code official finds any building, premises, vehicle, system or equipment that is in violation of this code, the code official is authorized to issue corrective orders.~~

~~**K1002.2 Notice.** Wherever the code official determines violations of this code or observes an apparent or actual violation of a provision of this code or other codes or ordinances under the code official's jurisdiction, the code official is authorized to prepare a written notice of violation describing the conditions deemed unsafe and, where compliance is not immediate, specifying a time for reinspection. Such order shall direct the discontinuance of the illegal action or condition and the abatement of the violation.~~

~~**K1002.3 Service.** Any order or notice issued pursuant to this code shall be served upon the owner, operator, occupant or other person responsible for the condition or violation, either by personal service, mail or by delivering the same to, and leaving it with, some person of responsibility upon the premises. For unattended or abandoned locations, a copy of such order or notice shall be posted on the premises in a conspicuous place at or near the entrance to such premises, and the order or notice shall be mailed by certified mail with return receipt requested or a certificate of mailing, to the last known address of the owner, occupant or both.~~

~~**K1002.4 Compliance with orders and notices.** Orders and notices issued or served as provided by this code shall be complied with by the owner, operator, occupant or other person responsible for the condition or violation to which the order or notice pertains.~~

~~**K1002.5 Failure to correct violations.** If the notice of violation is not complied with, the code official is authorized to request the legal counsel of the jurisdiction to institute the appropriate legal proceedings to restrain, correct or abate such violation or to require removal or termination of the unlawful occupancy of the structure in violation of the provisions of this code or of any order or direction made pursuant thereto.~~

~~**K1002.6 Failure to comply.** Failure to comply with an abatement notice or other corrective notice issued by the code official shall result in each day that such violation continues being regarded as a new and separate offense.~~

~~**K1002.7 Unauthorized tampering.** Signs, tags or seals posted or affixed by the code official shall not be mutilated, destroyed or tampered with or removed without authorization from the code official.~~

SECTION K1003 PENALTIES

~~**K1003.1 Penalties.** Any person who fails to comply with the provisions of this code or who fails to carry out an order made pursuant of this code or violates any condition attached to a permit, approval or certificate shall be subject to the penalties established by this jurisdiction.~~

~~**K1003.2 Abatement of violation.** The imposition of the penalties herein described shall not prevent the legal officer of the jurisdiction from instituting appropriate action to prevent unlawful construction or to restrain, correct or abate a violation; or to prevent illegal occupancy of a structure or premises; or to stop an illegal act, conduct of business or occupancy of a structure on or about any premises.~~

SECTION K1004 STOP WORK ORDER

~~**K1004.1 Issuance.** Upon notice from the code official that any electrical work is being done contrary to the provisions of this code or in a dangerous or unsafe manner, such work shall immediately cease. Such notice shall be in writing and shall be given to the owner of the property, or to the owner's agent, or to the person doing the work. The notice shall state the conditions under which work is authorized to resume.~~

~~**K1004.2 Emergencies.** Where an emergency exists, the code official shall not be required to give a written notice prior to stopping the work.~~

~~**K1004.3 Unlawful continuance.** Any person who shall continue any work in or about the structure after having been served with a stop work order, except such work as that person is directed to perform to remove a violation or unsafe condition, shall be subject to penalties as prescribed by law.~~

CHAPTER K11 MEANS OF APPEAL

SECTION K1101 GENERAL

~~**K1101.1 Board of appeals established.** In order to hear and decide appeals of orders, decisions or determinations made by the code official relative to the application and interpretation of this code, there shall be and is hereby created a board of appeals. The board of appeals shall be appointed by the governing body and shall hold office at its pleasure. The board shall adopt rules of procedure for conducting its business, and shall render all decisions and findings in writing to the appellant with a duplicate copy to the code official.~~

~~**K1101.2 Limitations on authority.** An application for appeal shall be based on a claim that the true intent of this code or the rules legally adopted there under have been incorrectly interpreted, the provisions of this code do not fully apply, or an at least equivalent method of protection or safety is proposed. The board shall have no authority to waive the requirements of this code.~~

SECTION K1102 MEMBERSHIP

~~**K1102.1 Membership of board.** The board of appeals shall consist of five members appointed by the chief appointing authority as follows: one for five years; one for four years; one for three years; one for two years and one for one year. Thereafter, each new member shall serve for five years or until a successor has been appointed.~~

~~**K1102.2 Qualifications.** The board of appeals shall consist of five individuals, one from each of the following professions or disciplines:~~

- ~~1. Registered design professional who is a registered architect; or a builder or superintendent of building construction with at least 10 years' experience, five of which shall have been in responsible charge of work.~~
- ~~2. Registered design professional with structural engineering or architectural experience.~~

3. Registered design professional with mechanical, plumbing or fuel-gas engineering experience; or a mechanical, plumbing or fuel-gas contractor with at least 10 years' experience, five of which shall have been in responsible charge of work.
4. Registered design professional with electrical engineering experience; or an electrical contractor with at least 10 years' experience, five of which shall have been in responsible charge of work.
5. Registered design professional with fire protection engineering experience; or a fire protection contractor with at least 10 years' experience, five of which shall have been in responsible charge of work.
6. The code official shall be an ex officio member of said board, but shall have no vote on any matter before the board.

K1102.3 Alternate members. The chief appointing authority shall appoint two alternate members who shall be called on by the board chairman to hear appeals during the absence or disqualification of a member. Alternate members shall possess the qualifications required for board membership and shall be appointed for five years, or until a successor has been appointed.

K1102.4 Chairman. The board shall annually select one of its members to serve as chairman.

K1102.5 Disqualification of members. A member shall not hear an appeal in which that member has a personal, professional or financial interest.

K1102.6 Secretary. The chief appointing authority shall designate a qualified clerk to serve as secretary to the board. The secretary shall file a detailed record of all proceedings in the office of the chief appointing authority.

K1102.7 Compensation of members. Compensation of members shall be determined by law.

SECTION K1103 PROCEDURES

K1103.1 Application for appeal. A person shall have the right to appeal a decision of the code official to the board of appeals. An application for appeal shall be based on a claim that the true intent of this code or the rules legally adopted there under, have been incorrectly interpreted, the provisions of this code do not fully apply, or an equally good or better form of construction is proposed. The application shall be filed on a form obtained from the code official within 20 days after the notice was served.

K1103.2 Notice of meeting. The board shall meet upon notice from the chairman, within 10 days of the filing of an appeal, or at stated periodic meetings.

K1103.3 Open hearing. All hearings before the board shall be open to the public. The appellant, the appellant's representative, the code official and any person whose interests are affected shall be given an opportunity to be heard.

K1103.4 Rules of procedure. The board shall adopt and make available to the public through the secretary rules of procedure under which a hearing will be conducted. The procedures shall not require compliance with strict rules of evidence, but shall mandate that only relevant information be received.

K1103.5 Postponed hearing. Where five members are not present to hear an appeal, either the appellant or the appellant's representative shall have the right to request a postponement of the hearing.

K1103.6 Decisions. The board shall modify or reverse the decision of the code official by a concurring vote of three members.

K1103.6.1 Resolution. The decision of the board shall be by resolution. Certified copies shall be furnished to the appellant and to the code official.

K1103.6.2 Administration. The code official shall take immediate action in accordance with the decision of the board.

K1103.7 Court review. Any person, whether or not a previous party of the appeal, shall have the right to apply to the appropriate court for a writ of certiorari to correct errors of law. Application for review shall be made in the manner and time required by law following the filing of the decision in the office of the chief appointing authority.

**CHAPTER K12
ELECTRICAL PROVISIONS**

**SECTION K1204 K110
ELECTRICAL PROVISIONS**

K110.1 General.

~~**K1201.1 Scope.** This chapter governs the design and construction of electrical systems and equipment.~~

~~**K1201.1.1 Adoption.** **K110.1.1 Referenced codes.** Electrical systems and equipment shall be designed and constructed in accordance with the *International Residential Code* or NFPA 70 as applicable, except as otherwise provided in this code.~~

~~**[F] K1201.2 K110.1.2 Abatement of electrical hazards.** All identified electrical hazards shall be abated. All identified hazardous electrical conditions in permanent wiring shall be brought to the attention of the code building official responsible for enforcement of this code. Electrical wiring, devices, appliances and other equipment which is modified or damaged and constitutes an electrical shock or fire hazard shall not be used.~~

~~**[F] K1201.3 K110.1.3 Appliance and fixture listing.** Electrical appliances and fixtures shall be tested and listed in published reports of inspected electrical equipment by an approved agency and installed in accordance with all instructions included as part of such listing.~~

SECTION K1202

K110.2 Provisions

~~**K1202.1 General.** The provisions of this section shall apply to the design, construction, installation, use and maintenance of electrical systems and equipment. Where differences occur between provisions of this code and referenced codes or standards, the provisions of this code shall apply.~~

~~**K1202.2 K110.2.1 Nonmetallic-sheathed cable.** The use of Type NM, NMC and NMS (nonmetallic sheathed) cable wiring methods shall not be limited based on height, number of stories or construction type of the building or structure.~~

~~**K1202.3 K110.2.2 Cutting, notching and boring.** The cutting, notching and boring of wood and steel framing members, structural members and engineered wood products shall be in accordance with the *International Building Code*.~~

~~**K1202.4 Penetrations.** Penetrations of walls, floors, ceilings and assemblies required to have a fire-resistance rating, shall be protected in accordance with the *International Building Code*. Where cables, conductors and raceways penetrate fireblocking or draftstopping, such penetrations shall be protected by filling the annular space with an approved fireblocking material.~~

~~**K1202.5 K110.2.3 Smoke detector circuits.** Smoke detectors required by the *International Building Code* and installed within dwelling units shall not be connected as the only load on a branch circuit. Such detectors shall be supplied by branch circuits having lighting loads consisting of lighting outlets in habitable spaces.~~

~~**[M] K1202.6 Appliance access.** Where appliances requiring access are installed in attics or underfloor spaces, a luminaire controlled by a switch located at the required passageway opening to such space and a receptacle outlet shall be provided at or near the appliance location.~~

~~**[FG] K1202.7 Prohibited grounding electrode.** Fuel gas piping shall not be used as a grounding electrode.~~

~~**[F] K1202.8 Emergency and standby power.** Emergency and standby power systems required by the *International Building Code* or *International Fire Code* shall be installed in accordance with the *International Building Code*, the *International Fire Code*, NFPA 110, NFPA 111 and this code.~~

~~**[F] K1202.9 Smoke control systems.** Smoke control systems required by the *International Building Code* or *International Fire Code* shall be supplied with two sources of power. Primary power shall be the normal building power systems. Secondary power shall be from an approved standby source complying with this code. The standby~~

power source and its transfer switches shall be in a separate room from the normal power transformers and switch gear, and shall be enclosed in a room constructed of not less than 1-hour fire-resistance-rated fire barriers, ventilated directly to and from the exterior. Power distribution from the two sources shall be by independent routes. Transfer to full standby power shall be automatic and within 60 seconds of failure of the primary power.

~~[F] K1202.9.1 Power sources and power surges.~~ Elements of the smoke management system relying on volatile memories or the like shall be supplied with uninterruptible power sources of sufficient duration to span 15-minute primary power interruption. Elements of the smoke management system susceptible to power surges shall be suitably protected by conditioners, suppressors or other approved means.

~~[F] K1202.9.2 Wiring.~~ In addition to meeting the requirements of this code, all signal and control wiring for smoke control systems, regardless of voltage, shall be fully enclosed within continuous raceways.

~~[M] K1202.10 Wiring in plenums.~~ Combustible electrical or electronic wiring methods and materials, optical fiber cable, and optical fiber raceway exposed within plenums regulated by Section 602 of the *International Mechanical Code* shall have a peak optical density not greater than 0.50, an average optical density not greater than 0.15, and a flame spread not greater than 5 feet (1524 mm) when tested in accordance with NFPA 262. Only type OFNP (plenum-rated nonconductive optical fiber cable) shall be installed in plenum-rated optical fiber raceways. Wiring, cable and raceways addressed in this section shall be listed and labeled as plenum rated and shall be installed in accordance with this code.

~~[M] K1202.10.1 Combustible electrical equipment.~~ Combustible electrical equipment exposed within plenums regulated by Section 602 of the *International Mechanical Code* shall have a peak rate of heat release not greater than 100 kilowatts (kW), a peak optical density not greater than 0.50, and an average optical density not greater than 0.15 when tested in accordance with UL 2043. Combustible electrical equipment shall be listed and labeled.

~~[M] K1202.11 Engine and gas turbine-powered equipment and appliances.~~ Permanently installed equipment and appliances powered by internal combustion engines and turbines shall be installed in accordance with the manufacturer's installation instructions, the *International Mechanical Code*, *International Fuel Gas Code* and NFPA 37.

~~[F] K1202.12 Stationary fuel cell power systems.~~ Stationary fuel cell power systems having a power output not exceeding 10MW shall be tested in accordance with ANSI-ISA America FC1 and shall be installed in accordance with the manufacturer's installation instructions and NFPA 853.

~~[M] K1202.13 Boiler control requirements.~~ The power supply to the electrical control system for boilers shall be from a two-wire branch circuit that has a grounded conductor or from an isolation transformer with a two-wire secondary. Where an isolation transformer is provided, one conductor of the secondary winding shall be grounded. Control voltage shall not exceed 150 volts nominal, line to line. Control and limit devices shall interrupt the ungrounded side of the circuit. A means of manually disconnecting the control circuit shall be provided, and controls shall be arranged so that when deenergized, the burner shall be inoperative. Such disconnecting means shall be capable of being locked in the off position and shall be provided with ready access.

~~[F] K1202.14 K110.2.4 Equipment and door labeling.~~ Doors into electrical control panel rooms shall be marked with a plainly visible and legible sign stating ELECTRICAL ROOM or similar approved wording. The disconnecting means for each service, feeder or branch circuit originating on a switchboard or panelboard shall be legibly and durably marked to indicate its purpose unless such purpose is clearly evident.

~~[F] K1202.15 Smoke alarm power source.~~ In new construction, required smoke alarms shall receive their primary power from the building wiring where such wiring is served from a commercial source and shall be equipped with a battery backup. Smoke alarms shall emit a signal when the batteries are low. Wiring shall be permanent and without a disconnecting switch other than as required for overcurrent protection.

Exception: Smoke alarms are not required to be equipped with battery backup in Group R-1 where they are connected to an emergency electrical system.

~~[F] K1202.16 Smoke alarm interconnection.~~ Where more than one smoke alarm is required to be installed within an individual dwelling unit or sleeping unit in Group R-2, R-3 or R-4, or within an individual sleeping unit in Group R-1, the smoke alarms shall be interconnected in such a manner that the activation of one alarm will activate all of the alarms in the individual unit. The alarm shall be clearly audible in all bedrooms over background noise levels with all intervening doors closed.

**SECTION K1203
EXISTING ELECTRICAL FACILITIES**

~~**[PM] K1203.1 Existing buildings.** This section shall apply to buildings and structures that are within the scope of the *International Property Maintenance Code*. Every occupied building shall be provided with an electrical system in compliance with the requirements of Sections K1203.1.1 through K1203.1.5.~~

~~**[PM] K1203.1.1 Service.** The size and usage of appliances and equipment shall serve as a basis for determining the need for additional facilities in accordance with this code. Dwelling units shall be served by a three-wire, 120/240 volt, single-phase electrical service having a rating of not less than 60 amperes.~~

~~**[PM] K1203.1.2 Electrical system hazards.** Where it is found that the electrical system in a structure constitutes a hazard to the occupants or the structure by reason of inadequate service, improper fusing, insufficient receptacle and lighting outlets, improper wiring or installation, deterioration or damage, or for similar reasons, the code official shall require the defects to be corrected to eliminate the hazard.~~

~~**[PM] K1203.1.3 Installation.** All electrical equipment, wiring and appliances shall be properly installed and maintained in a safe and approved manner.~~

~~**[PM] K1203.1.4 Receptacles.** Every habitable space in a dwelling shall be provided with at least two separate and remote receptacle outlets. Every laundry area shall be provided with at least one grounding-type receptacle outlet or a receptacle outlet with ground fault circuit interrupter protection. Every bathroom shall contain at least one receptacle outlet. Any new bathroom receptacle outlet shall have ground fault circuit interrupter protection.~~

~~**[PM] K1203.1.5 Luminaires.** Every public hall, interior stairway, toilet room, kitchen, bathroom, laundry room, boiler room and furnace room shall be provided with at least one electric luminaire.~~

Reason: The purpose of this code change proposal is to eliminate redundant and otherwise unnecessary text from Appendix K, and to coordinate the Appendix with the body of the IBC. It is not intended to make substantive changes to the provisions of Appendix K with one exception noted below.

At the 2005 Annual Business Meeting, the membership voted to place the text of the entire *International Code Council Electrical Code Administrative Provisions* in an appendix chapter of the IBC. We did not, however, coordinate the new appendix chapter with the IBC.

This proposal deletes sections that duplicate other sections of the IBC or sections of other codes adopted by reference in the IBC. Those sections are unnecessary because Appendix K is intended to be used in conjunction with the IBC—before a jurisdiction would adopt Appendix K, it will have already adopted the IBC.

Some provisions of Appendix K are copied from the IFC, IMC, IFGC and IPMC. This proposal deletes those sections because those sections address subjects that are not governed by the Building Code.

The following list shows the sections proposed to be deleted from Appendix K and the sections of the IBC and other codes which are duplicated. In cases where procedures specified in Appendix K are different than the IBC, this proposal deletes the Appendix K provision unless it is specific to electrical systems.

<u>Appendix K Section</u>	<u>Other Code Section</u>
K101.1 Title	IBC 101.1
K102.1.4 & .5	IBC 3406 & 3408
K102.2 – K102.6	IBC 102
K102.7	IBC 101.2.1
Chapter K2	IBC Chapter 2
K301	IBC 103
K302	IBC 104
K303	IBC 110
K401.1, K402, K403	IBC 105
K404	IBC 108
Chapter K5	IBC 106
Chapter K6	IBC 104.9, 104.10, 104.11
K701	IBC 104.4
K702.1.5 – K702.3	IBC 109
K702.4	IBC 104.5 – 104.6
K702.5 – K702.7	IBC 109
K801.1 – K801.3	IBC 111
K901	IBC 115
Chapter K10	IBC 113, 114
Chapter K11	IBC 112, Appendix B
K1202.4	IBC 712
K1202.6	IMC 306.3.1, 306.4.1
K1202.7	IFGC 309.1
K1202.8	IBC Chapter 27
K1202.9	IBC 909.11
K1202.10	IMC 602
K1202.11	IMC 915, IFGC 616

Appendix K Section

K1202.12
K1202.13
K1202.16
K1203

IMC 924, IFGC 633
IMC 1006.8
IBC 907.2.10.3
IPMC 604 & 605

Other Code Section

The only instance in which this proposal would make a substantive change to Appendix K is in the deletion of Section K1202.15. Appendix K applies the requirement for battery back up for all smoke alarms in new construction. The IFC applies this requirement only to Group R occupancies.

In addition, some provisions of Section K101, such as K101, are modified slightly to make them more parallel to language in Chapter 1 while addressing electrical issues. The term "code official" is changed to "building official" for consistency with the rest of the IBC.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The proposal was approved to ensure that the appendix correlates with the body of the code. Without correlation the adoption of the appendix would create redundancies.

Assembly Action:

None

Final Hearing Results

G220-06/07

AS

Code Change No: G221-06/07

Original Proposal

Chapters 1 and 2

THIS PROPOSAL IS ON THE AGENDA OF THE IBC GENERAL, IEBC, IECC, IFC, IFGC, IMC, IPC, IPSDC, IRC BUILDING/ENERGY, IWUIC AND IZC CODE DEVELOPMENT COMMITTEES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEE

Proponent: Lawrence Brown, CBO, National Association of Home Builders

PART I – IBC GENERAL

Revise chapters as follows:

Unless otherwise noted, the section numbers shown below are inclusive of all subsections as shown in the 2006 Codes, Chapter 1. Only those sections that have been divided into two separate chapters are noted below with the proposed new subsection number (applies to all codes represented in this code change proposal).

CHAPTER 1
ADMINISTRATION

SECTION 101
GENERAL

101.1 Title.

(All other Subsections of Section 101 moved into new Chapter 2, Section 201)

SECTION ~~102~~ 403
DEPARTMENT OF BUILDING SAFETY

**SECTION 103 ~~404~~
DUTIES AND POWERS OF BUILDING OFFICIAL**

**SECTION 104 ~~405~~
PERMITS**

**SECTION 105 ~~407~~
TEMPORARY STRUCTURES AND USES**

105.1 ~~407.1~~ Permits **General. The building official is authorized to issue a permit for temporary structures and temporary uses. Such permits shall be limited as to time of service, but shall not be permitted for more than 180 days. The building official is authorized to grant extensions for demonstrated cause.**

105.2 ~~407.4~~ Termination of approval. The building official is authorized to terminate such permit for a temporary structure or use and to order the temporary structure or use to be discontinued.

**SECTION 106 ~~408~~
FEES**

**SECTION 107 ~~409~~
INSPECTIONS**

**SECTION 108 ~~410~~
CERTIFICATE OF OCCUPANCY**

**SECTION 109 ~~411~~
SERVICE UTILITIES**

**SECTION 110 ~~412~~
BOARD OF APPEALS**

**SECTION 111 ~~413~~
VIOLATIONS**

**SECTION 112 ~~414~~
STOP WORK ORDER**

**CHAPTER 2
SCOPE AND APPLICATION**

**SECTION 201 ~~401~~
SCOPE AND GENERAL REQUIREMENTS**

201.1 ~~401.2~~ Scope.

201.2 ~~401.2.1~~ Appendices.

201.3 ~~401.3~~ Intent.

201.4 ~~401.4~~ Referenced codes.

**SECTION 202 ~~402~~
APPLICABILITY**

**SECTION 203 ~~406~~
CONSTRUCTION DOCUMENTS**

**SECTION 204 ~~407~~
TEMPORARY STRUCTURES AND USES**

204.1 ~~407.2~~ Conformance. Temporary structures and uses shall conform to the structural strength, fire safety, means of egress, accessibility, light, ventilation and sanitary requirements of this code as necessary to ensure public health, safety and general welfare.

204.2 107.3 Temporary power. The building official is authorized to give permission to temporarily supply and use power in part of an electric installation before such installation has been fully completed and the final certificate of completion has been issued. The part covered by the temporary certificate shall comply with the requirements specified for temporary lighting, heat or power in the *International Code Council Electrical Code Administrative Provisions*.

**SECTION 205 145
UNSAFE STRUCTURES AND EQUIPMENT**

PART II – IEBC

**CHAPTER 1
ADMINISTRATION**

**SECTION 101
GENERAL**

101.1 Title.

(All other subsections of Section 101 moved into new Chapter 2, Section 201)

**SECTION 102 403
DEPARTMENT OF BUILDING SAFETY**

**SECTION 103 404
DUTIES AND POWERS OF CODE OFFICIAL**

**SECTION 104 405
PERMITS**

**SECTION 105 407
TEMPORARY STRUCTURES AND USES**

105.1 107.4 Permits General. The code official is authorized to issue a permit for temporary uses. Such permits shall be limited as to time of service, but shall not be permitted for more than 180 days. The code official is authorized to grant extensions for demonstrated cause.

105.2 107.4 Termination of approval. The code official is authorized to terminate such permit for a temporary use and to order the temporary use to be discontinued.

**SECTION 105 406
INSPECTIONS**

**SECTION 106 408
FEES**

**SECTION 107 409
INSPECTIONS**

**SECTION 108 440
CERTIFICATE OF OCCUPANCY**

**SECTION 109 442
BOARD OF APPEALS**

**SECTION 110 443
VIOLATIONS**

**SECTION 111 444
STOP WORK ORDER**

CHAPTER 2
SCOPE AND APPLICATION

SECTION 201 ~~401~~
SCOPE AND GENERAL REQUIREMENTS

201.1 ~~401.2~~ Scope.

201.2 ~~401.3~~ Intent.

201.3 ~~401.4~~ Applicability.

201.4 ~~401.5~~ Compliance methods.

201.5 ~~401.6~~ Safeguards during construction.

201.6 ~~401.7~~ Appendices.

201.7 ~~401.8~~ Correction of violations of other codes.

SECTION 202 ~~402~~
APPLICABILITY

SECTION 203 ~~406~~
CONSTRUCTION DOCUMENTS

SECTION 204 ~~407~~
TEMPORARY STRUCTURES AND USES

204.1 ~~407.2~~ Conformance. Temporary uses shall conform to the structural strength, fire safety, means of egress, accessibility, light, ventilation and sanitary requirements of this code as necessary to ensure the public health, safety and general welfare.

204.2 ~~407.3~~ Temporary power. The code official is authorized to give permission to temporarily supply and use power in part of an electric installation before such installation has been fully completed and the final certificate of completion has been issued. The part covered by the temporary certificate shall comply with the requirements specified for temporary lighting, heat or power in the *International Code Council Electrical Code Administrative Provisions*.

SECTION 205 ~~411~~
SERVICE UTILITIES

SECTION 206 ~~415~~
UNSAFE BUILDINGS AND EQUIPMENT

SECTION 207 ~~416~~
EMERGENCY MEASURES

SECTION 208 ~~417~~
DEMOLITION

(Renumber subsequent chapters)

PART III – IECC

CHAPTER 1
ADMINISTRATION

SECTION 101
GENERAL SCOPE AND GENERAL REQUIREMENTS

101.1 Tile.

(All other subsections of Section 101 moved into new Chapter 2, Section 201)

SECTION 102 ~~405~~
INSPECTIONS

CHAPTER 2
SCOPE AND APPLICATION

SECTION 201 ~~104~~
SCOPE AND GENERAL REQUIREMENTS

201.1 ~~104.2~~ Scope.

201.2 ~~104.3~~ Intent.

201.3 ~~104.4~~ Applicability.

201.4 ~~104.5~~ Compliance.

SECTION 202 ~~102~~
MATERIALS, SYSTEMS AND EQUIPMENT

SECTION 203 ~~103~~
ALTERNATE MATERIALS – METHOD OF CONSTRUCTION, DESIGN OR INSULATING SYSTEMS

SECTION 204 ~~104~~
CONSTRUCTION DOCUMENTS

SECTION 205 ~~106~~
VALIDITY

SECTION 206 ~~107~~
REFERENCED STANDARDS

(Renumber subsequent chapters)

PART IV – IFC

CHAPTER 1
ADMINISTRATION

SECTION 101
GENERAL

101.1 Title.

(All other subsections of Section 101 moved into new Chapter 2, Section 201)

SECTION 102 ~~103~~
DEPARTMENT OF FIRE PREVENTION

SECTION 103 ~~104~~
GENERAL AUTHORITY AND RESPONSIBILITIES

SECTION 104 ~~105~~
PERMITS

SECTION 105 ~~106~~
INSPECTIONS

SECTION 106 ~~108~~
BOARD OF APPEALS

SECTION 107 ~~109~~
VIOLATIONS

SECTION 108 ~~111~~
STOP WORK ORDER

CHAPTER 2
SCOPE AND APPLICATION

SECTION 201 401
SCOPE AND GENERAL REQUIREMENTS

201.1 401.2 Scope.
201.2 401.2.4 Appendices.
201.3 401.3 Intent.
201.4 401.4 Severability.
201.5 401.5 Validity.

SECTION 202 402
APPLICABILITY

SECTION 203 407
MAINTENANCE

SECTION 204 440
UNSAFE BUILDINGS

(Renumber subsequent chapters)

PART V – IFGC

CHAPTER 1
ADMINISTRATION

SECTION 101
GENERAL

101.1 Title.
(All other Subsections of Section 101 moved into new Chapter 2, Section 201)

SECTION 102 403
DEPARTMENT OF INSPECTION

SECTION 103 404
DUTIES AND POWERS OF CODE OFFICIAL

SECTION 104 406
PERMITS

SECTION 105 407
INSPECTION AND TESTING

SECTION 106 408
VIOLATIONS

SECTION 107 409
MEANS OF APPEAL

CHAPTER 2
SCOPE AND APPLICATION

SECTION 201 401
SCOPE AND GENERAL REQUIREMENTS

201.1 401.2 Scope.
201.2 401.3 Appendices.
201.3 401.4 Intent.
201.4 401.5 Severability.

SECTION ~~202~~ ~~402~~
APPLICABILITY

SECTION ~~203~~ ~~405~~
APPROVAL

(Renumber subsequent chapters)

PART VI – IMC

CHAPTER 1
ADMINISTRATION

SECTION 101
GENERAL

101.1 Title.

(All other Subsections of Section 101 moved into new Chapter 2, Section 201)

SECTION ~~102~~ ~~403~~
DEPARTMENT OF MECHANICAL INSPECTION

SECTION ~~103~~ ~~404~~
DUTIES AND POWERS OF CODE OFFICIAL

SECTION ~~104~~ ~~406~~
PERMITS

SECTION ~~105~~ ~~407~~
INSPECTIONS AND TESTING

SECTION ~~106~~ ~~408~~
VIOLATIONS

SECTION ~~107~~ ~~409~~
MEANS OF APPEAL

CHAPTER 2
SCOPE AND APPLICATION

SECTION ~~201~~ ~~404~~
SCOPE AND GENERAL REQUIREMENTS

201.1 ~~404.2~~ Scope.

201.2 ~~404.2.1~~ Appendices.

201.3 ~~404.3~~ Intent.

201.4 ~~404.4~~ Severability.

SECTION ~~202~~ ~~402~~
APPLICABILITY

SECTION ~~203~~ ~~405~~
APPROVAL

(Renumber subsequent chapters)

PART VII – IPC

CHAPTER 1
ADMINISTRATION

SECTION 101
GENERAL

101.1 Title. These regulations shall be known as the *International Plumbing Code* of [NAME OF JURISDICTION] hereinafter referred to as “this code.”

SECTION ~~403~~ 102
DEPARTMENT OF PLUMBING INSPECTION

SECTION ~~404~~ 103
DUTIES AND POWERS OF THE CODE OFFICIAL

SECTION ~~406~~ 104
PERMITS

SECTION ~~407~~ 105
INSPECTIONS AND TESTING

SECTION ~~408~~ 106
VIOLATIONS

SECTION ~~409~~ 107
MEANS OF APPEAL

CHAPTER 2
~~DEFINITIONS~~ SCOPE AND APPLICATION

SECTION 201
SCOPE AND GENERAL REQUIREMENTS

401.2 201.1 Scope.
401.3 201.2 Intent.
401.4 201.3 Severability.

SECTION ~~402~~ 202
APPLICABILITY

SECTION ~~405~~ 203
APPROVAL

(Renumber subsequent chapters)

PART XIII – IPMC

CHAPTER 1
ADMINISTRATION

SECTION 101
GENERAL

101.1 Title.
(All other Subsections of Section 101 moved into new Chapter 2, Section 201)

SECTION ~~102~~ 403
DEPARTMENT OF PROPERTY MAINTENANCE INSPECTION
SECTION ~~103~~ 404
DUTIES AND POWERS OF CODE OFFICIAL

SECTION ~~104~~ 406
VIOLATIONS

SECTION ~~105~~ 407
NOTICES AND ORDERS

**SECTION ~~107~~ 114
MEANS OF APPEAL**

**CHAPTER 2
SCOPE AND APPLICATION**

**SECTION ~~201~~ 104
SCOPE AND GENERAL REQUIREMENTS**

201.1 ~~104.2~~ Scope.
201.2 ~~104.3~~ Intent.
201.3 ~~104.4~~ Severability.

**SECTION ~~202~~ 102
APPLICABILITY**

**SECTION ~~203~~ 105
APPROVAL**

**SECTION ~~204~~ 108
UNSAFE STRUCTURES AND EQUIPMENT**

**SECTION ~~205~~ 109
EMERGENCY MEASURES**

**SECTION ~~206~~ 110
DEMOLITION**

(Renumber subsequent chapters)

PART IX – IPSDC

**CHAPTER 1
ADMINISTRATION**

**SECTION 101
GENERAL SCOPE AND GENERAL REQUIREMENTS**

101.1 Tile.
(All other Subsections of Section 101 moved into new Chapter 2, Section 201)

**SECTION ~~102~~ 103
DEPARTMENT OF PRIVATE SEWAGE DISPOSAL INSPECTION**

**SECTION ~~103~~ 104
DUTIES AND POWERS OF THE CODE OFFICIAL**

**SECTION ~~104~~ 106
PERMITS**

SECTION ~~105~~ 107

**SECTION ~~106~~ 108
VIOLATIONS**

**SECTION ~~107~~ 109
APPEAL**

**CHAPTER 2
SCOPE AND APPLICATION**

**SECTION ~~201~~ 104
SCOPE AND GENERAL REQUIREMENTS**

201.1 ~~104.2~~ Scope.
201.2 ~~104.6~~ Intent. (Moved up from current 101.6)

201.3 ~~401.3~~ Public sewer connection.

201.4 ~~401.4~~ Abandoned systems.

201.5 ~~401.5~~ Failing system.

201.6 ~~401.7~~ Severability.

SECTION 202 ~~402~~
APPLICABILITY

SECTION 203 ~~405~~
APPROVAL

(Renumber subsequent chapters)

PART X – IRC BUILDING/ENERGY

Part I — Administrative

CHAPTER 1
ADMINISTRATION

SECTION R101
GENERAL TITLE, SCOPE AND PURPOSE

R101.1 Title.

SECTION R102 ~~R403~~
DEPARTMENT OF BUILDING SAFETY

SECTION R103 ~~R404~~
DUTIES AND POWERS OF THE
BUILDING OFFICIAL

SECTION R104 ~~R405~~
PERMITS

SECTION R105 ~~R407~~
TEMPORARY STRUCTURES AND USES

R107.1 General. The building official is authorized to issue a permit for temporary structures and temporary uses. Such permits shall be limited as to time of service, but shall not be permitted for more than 180 days. The building official is authorized to grant extensions for demonstrated cause.

R107.4 Termination of approval. The building official is authorized to terminate such permit for a temporary structure or use and to order the temporary structure or use to be discontinued.

SECTION R106 ~~R408~~
FEES

SECTION R107 ~~R409~~
INSPECTIONS

SECTION R108 ~~R440~~
CERTIFICATE OF OCCUPANCY

SECTION R109 ~~R442~~
BOARD OF APPEALS

SECTION R110 ~~R443~~
VIOLATIONS

**SECTION R111 ~~R114~~
STOP WORK ORDER**

**CHAPTER 2
SCOPE AND APPLICATION**

**SECTION R201
SCOPE AND GENERAL REQUIREMENTS**

**R201.1 ~~R401.2~~ Scope.
R201.2 ~~R401.3~~ Purpose.**

**SECTION R202 ~~R402~~
APPLICABILITY**

**SECTION R203 ~~R406~~
CONSTRUCTION DOCUMENTS**

**SECTION R204 ~~R407~~
TEMPORARY STRUCTURES AND USES**

R204.1 ~~R407.2~~ Conformance. Temporary structures and uses shall conform to the structural strength, fire safety, means of egress, light, ventilation and sanitary requirements of this code as necessary to ensure the public health, safety and general welfare.

R204.2 ~~R407.3~~ Temporary power. The building official is authorized to give permission to temporarily supply and use power in part of an electric installation before such installation has been fully completed and the final certificate of completion has been issued. The part covered by the temporary certificate shall comply with the requirements specified for temporary lighting, heat or power in the *International Code Council Electrical Code Administrative Provisions*.

**SECTION R205 ~~R414~~
SERVICE UTILITIES**

(Renumber subsequent chapters)

PART XI – IWUIC

**CHAPTER 1
ADMINISTRATION**

**SECTION 101
GENERAL**

101.1 Title.

(All other Subsections of Section 101 moved into new Chapter 2, Section 201)

**SECTION 102
AUTHORITY OF THE CODE OFFICIAL**

**SECTION 103 ~~404~~
APPEALS**

**SECTION 104 ~~405~~
PERMITS**

**SECTION 105 ~~407~~
INSPECTIONS AND ENFORCEMENT**

**SECTION 106 ~~408~~
CERTIFICATION**

CHAPTER 2
SCOPE AND APPLICATION

SECTION 201 404
SCOPE AND GENERAL REQUIREMENTS

- 201.1 ~~404.2~~ Scope.
- 201.2 ~~404.3~~ Objective.
- 201.3 ~~404.4~~ Retroactivity.
- 201.4 ~~404.5~~ Additions and alterations.
- 201.5 ~~404.6~~ Maintenance.

SECTION 202 403
COMPLIANCE ALTERNATIVES

SECTION 203 406
PLANS AND SPECIFICATIONS

(Renumber subsequent chapters)

PART XII – IZC

CHAPTER 1
ADMINISTRATION

SECTION 101
GENERAL

- 101.1 Title.**
(All other Subsections of Section 101 moved into new Chapter 2, Section 201)

SECTION 102
FEES

SECTION 103 404
DUTIES AND POWERS OF CODE OFFICIAL

SECTION 104 405
PLANNING COMMISSION

SECTION 105 406
COMPLIANCE WITH THE CODE

SECTION 106 407
BOARD OF ADJUSTMENT

SECTION 107 408
HEARING EXAMINER

SECTION 108 409
HEARINGS, APPEALS AND AMENDMENTS

SECTION 109 410
VIOLATIONS

SECTION 110 411
PERMITS AND APPROVALS

CHAPTER 2
SCOPE AND APPLICATION

SECTION 201 404
SCOPE AND GENERAL REQUIREMENTS

201.1 ~~401.3~~ Scope.

201.2 ~~401.4~~ Intent.

**SECTION ~~202~~ ~~403~~
EXISTING BUILDINGS AND USES**

(Renumber subsequent chapters)

Reason: This proposal separates out the “Scoping” and “Application” provisions from the “Administration” provisions of Chapter 1, and places them in a new Chapter 2. As the code grows, the first chapter is becoming a catch-all for the administrative provisions needed to enforce the code. As many jurisdictions are required to drastically modify or completely revise Chapter 1 to coordinate with the jurisdiction’s codified ordinances or other state and local administrative law, having these non-administrative provisions in a separate chapter will help retain the scoping, application, and intent of this code’s provisions when the code is adopted.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

PART I — IBC GENERAL

Committee Action:

Disapproved

Committee Reason: A modification consistent with the actions taken by other committees was not presented to the committee therefore as currently proposed it was not acceptable. One specific concern about the published proposal was that permits would be addressed in a different chapter than construction documents.

Assembly Action:

None

PART II — IEBC

Committee Action:

Approved as Modified

Replace the proposal with the following:

**CHAPTER 1
SCOPE AND ADMINISTRATION**

Part 1 – Scope and Application

**SECTION 101
GENERAL**

**SECTION 102
APPLICABILITY**

Part 2 – Administration and Enforcement

**SECTION 103
DEPARTMENT OF BUILDING SAFETY**

Committee Reason: The committee agreed that separating scoping and application provisions from administrative provisions within Chapter 1 of the IEBC was appropriate and allowed for jurisdictions to modify the administrative provisions as required by their local laws while easily retaining the scoping, application and intent provisions of the code. The modification allows for two separate parts versus two separate Chapters. This modification eliminates a massive chapter and section reference re-numbering requirement throughout the I-codes that would be a possible source of confusion and future errata.

Assembly Action:

None

PART III — IECC

Committee Action:

Approved as Modified

Replace the current proposal with the following:

**CHAPTER 1
SCOPE AND ADMINISTRATION**

Part 1 – Scope and Application

**SECTION 101
SCOPE AND GENERAL REQUIREMENTS**

**SECTION 102
MATERIALS, SYSTEMS AND EQUIPMENT**

**SECTION 103
ALTERNATE MATERIALS – METHOD OF CONSTRUCTION, DESIGN OR INSULATING SYSTEMS**

Part 2 – Administration and Enforcement

**SECTION 104
CONSTRUCTION DOCUMENTS**

**SECTION 105
INSPECTIONS**

**SECTION 106
VALIDITY**

**SECTION 107
REFERENCED STANDARDS**

Committee Reason: The committee agreed with the proponent that separation of the administrative requirements from the scope and intent requirements avoids losing the scope and intent statements when a jurisdiction modifies the administrative requirements, as is often done. This modification eliminates a massive chapter and section reference re-numbering and correlation requirement throughout the I-codes that would be a possible source of confusion and future errata.

Assembly Action: **None**

**PART IV — IFC
Committee Action:** **Approved as Modified**

Replace the proposal with the following:

Revise Chapter 1 arrangement as follows:

**CHAPTER 1
SCOPE AND ADMINISTRATION**

Part 1 – General Provisions

Section 101 Scope and General Requirements

Section 102 Applicability

Part 2 – Administrative Provisions

Section 103 Department of Fire Prevention

Section 104 General Authority and Responsibilities

Section 105 Permits

Section 106 Inspections

Section 107 Maintenance

Section 108 Board of Appeals

Section 109 Violations

Section 110 Unsafe Buildings

Section 111 Stop Work Order

Committee Reason: The committee agreed that separating scoping and application provisions from administrative provisions within Chapter 1 of the IFC was appropriate and allowed for jurisdictions to modify the administrative provisions as required by their local laws while easily retaining the scoping, application and intent provisions of the code. The modification allows for two separate parts versus two separate chapters. This modification eliminates a massive chapter and section reference re-numbering and correlation requirement throughout the I-codes that would be a possible source of confusion and future errata.

Assembly Action: **None**

**PART V - IFGC
Committee Action:** **Approved as Modified**

Replace the current proposal with the following:

CHAPTER 1

SCOPE AND ADMINISTRATION**Part 1 – Scope and Application**SECTION 101
GENERALSECTION 102
APPLICABILITY**Part 2 – Administration and Enforcement**SECTION 103
DEPARTMENT OF INSPECTIONSECTION 104
DUTIES AND POWERS OF CODE OFFICIALSECTION 105
APPROVALSECTION 106
PERMITSSECTION 107
INSPECTIONS AND TESTINGSECTION 108
VIOLATIONSSECTION 109
MEANS OF APPEAL

Committee Reason: Many jurisdictions delete or modify chapter one of the ICC codes and in doing so, may lose some needed code text.. Separating scoping and application provisions from administrative provisions within Chapter 1 of the IFGC is appropriate and allows jurisdictions to modify the administrative provisions as required by their local laws while easily retaining the scoping, application and intent provisions of the code. The modification allows for two separate parts of Chapter one instead of creating two separate chapters. This modification eliminates the massive task of re-numbering all sections and section references throughout the ICC codes. Such re-numbering would be a likely source of confusion and future errata.

Assembly Action:**None****PART VI — IMC****Committee Action:****Approved as Modified**

Replace the proposal with the following:

**CHAPTER 1
SCOPE AND ADMINISTRATION****Part 1 – Scope and Application**SECTION 101
GENERALSECTION 102
APPLICABILITY**Part 2 – Administration and Enforcement**SECTION 103
DEPARTMENT OF MECHANICAL INSPECTIONSECTION 104
DUTIES AND POWERS OF CODE OFFICIALSECTION 105
APPROVALSECTION 106
PERMITSSECTION 107
INSPECTIONS AND TESTING

**SECTION 108
VIOLATIONS**

**SECTION 109
MEANS OF APPEAL**

Committee Reason: This change provides a needed reorganization of Chapter 1 which will allow local jurisdictions to revise or delete the Administration and Enforcement portion of the chapter without losing the Scope and Application requirements. The modification moves the proposed Chapter 2 to a new section in Chapter 1, Scope and Application, to avoid renumbering all subsequent chapters of the IMC.

Assembly Action:

None

**PART VII — IPC
Committee Action:**

Approved as Modified

Replace the proposal with the following:

**CHAPTER 1
SCOPE AND ADMINISTRATION**

Part 1 – Scope and Application

**SECTION 101
GENERAL**

**SECTION 102
APPLICABILITY**

Part 2 – Administration and Enforcement

**SECTION 103
DEPARTMENT OF PLUMBING INSPECTION**

**SECTION 104
DUTIES AND POWERS OF CODE OFFICIAL**

**SECTION 105
APPROVAL**

**SECTION 106
PERMITS**

**SECTION 107
INSPECTIONS**

**SECTION 108
VIOLATIONS**

**SECTION 109
MEANS OF APPEAL**

Committee Reason: Many jurisdictions delete or modify chapter one of the ICC codes and in doing so, may lose some needed code text. Separating scoping and application provisions from administrative provisions within Chapter 1 of the IFGC is appropriate and allows jurisdictions to modify the administrative provisions as required by their local laws while easily retaining the scoping, application and intent provisions of the code. The modification allows for two separate parts of Chapter one instead of creating two separate chapters. This modification eliminates the massive task of re-numbering all sections and section references throughout the ICC codes. Such re-numbering would be a likely source of confusion and future errata.

Assembly Action:

None

**PART VIII — IPMC
Committee Action:**

Approved as Modified

Replace the proposal with the following:

**CHAPTER 1
SCOPE AND ADMINISTRATION**

Part 1 – Scope and Application

**SECTION 101
GENERAL**

**SECTION 102
APPLICABILITY**

Part 2 – Administration and Enforcement

**SECTION 103
DEPARTMENT OF PROPERTY MAINTENANCE INSPECTION**

**SECTION 104
DUTIES AND POWERS OF CODE OFFICIAL**

**SECTION 105
APPROVAL**

**SECTION 106
VIOLATIONS**

**SECTION 107
NOTICES AND ORDERS**

**SECTION 108
UNSAFE STRUCTURES AND EQUIPMENT**

**SECTION 109
EMERGENCY MEASURES**

**SECTION 110
DEMOLITION**

**SECTION 111
MEANS OF APPEAL**

Committee Reason: The committee agreed that separating scoping and application provisions from administrative provisions within Chapter 1 of the IPMC was appropriate and allowed for jurisdictions to modify the administrative provisions as required by their local laws while easily retaining the scoping, application and intent provisions of the code. The modification allows for two separate parts versus two separate Chapters. This modification eliminates a massive chapter and section reference re-numbering requirement throughout the I-codes that would be a possible source of confusion and future errata.

Assembly Action:

None

**PART IX — IPSDC
Committee Action:**

Approved as Modified

Replace the proposal with the following:

**CHAPTER 1
SCOPE AND ADMINISTRATION**

Part 1 – Scope and Application

**SECTION 101
GENERAL**

**SECTION 102
APPLICABILITY**

Part 2 – Administration and Enforcement

**SECTION 103
DEPARTMENT OF PRIVATE SEWAGE DISPOSAL INSPECTION**

**SECTION 104
DUTIES AND POWERS OF CODE OFFICIAL**

**SECTION 105
APPROVAL**

**SECTION 106
PERMITS**

**SECTION 107
INSPECTIONS**

**SECTION 108
VIOLATIONS**

**SECTION 109
MEANS OF APPEAL**

Committee Reason: Many jurisdictions delete or modify chapter one of the ICC codes and in doing so, may lose some needed code text.. Separating scoping and application provisions from administrative provisions within Chapter 1 of the IFGC is appropriate and allows jurisdictions to modify the administrative provisions as required by their local laws while easily retaining the scoping, application and intent provisions of the code. The modification allows for two separate parts of Chapter one instead of creating two separate chapters. This modification eliminates the massive task of re-numbering all sections and section references throughout the ICC codes. Such re-numbering would be a likely source of confusion and future errata.

Assembly Action:

None

PART X — IRC

Committee Action:

Approved as Modified

Replace the proposal with the following:

**CHAPTER 1
SCOPE AND ADMINISTRATION**

Part 1 – Scope and Application

**SECTION 101
GENERAL TITLE, SCOPE AND PURPOSE**

**SECTION 102
APPLICABILITY**

Part 2 – Administration and Enforcement

**SECTION 103
DEPARTMENT OF BUILDING SAFETY**

**SECTION 104
DUTIES AND POWERS OF BUILDING OFFICIAL**

**SECTION 105
PERMITS**

**SECTION 106
CONSTRUCTION DOCUMENTS**

**SECTION 107
TEMPORARY STRUCTURES AND USES**

**SECTION 108
FEES**

**SECTION 109
INSPECTIONS**

**SECTION 110
CERTIFICATE OF OCCUPANCY**

**SECTION 111
SERVICE UTILITIES**

**SECTION 112
BOARD OF APPEALS**

**SECTION 113
VIOLATIONS**

**SECTION 114
STOP WORK ORDER**

Committee Reason: The committee agreed that separating scoping and application provisions from administrative provisions within Chapter 1 of the IRC was appropriate and allowed for jurisdictions to modify the administrative provisions as required by their local laws while easily retaining the scoping, application and intent provisions of the code. The modification allows for two separate parts versus two separate chapters. This modification eliminates a massive chapter and section reference re-numbering requirement throughout the I-codes that would be a possible source of confusion and future errata.

Assembly Action:

None

**PART XI —IWUIC
Committee Action:**

Approved as Modified

Replace the proposal with the following:

Revise Chapter 1 arrangement as follows:

**CHAPTER 1
SCOPE AND ADMINISTRATION**

Part 1 – General Provisions

Section 101 Scope and General Requirements

Part 2 – Administrative Provisions

Section 102 Authority of the Code Official

Section 103 Compliance Alternatives

Section 104 Appeals

Section 105 Permits

Section 106 Plans and Specifications

Section 107 Inspection and Enforcement

Section 108 Certificate of Completion

Committee Reason: The committee agreed that separating scoping and application provisions from administrative provisions within Chapter 1 of the IWUIC was appropriate and allowed for jurisdictions to modify the administrative provisions as required by their local laws while easily retaining the scoping, application and intent provisions of the code. The modification allows for two separate parts versus two separate chapters. This modification eliminates a massive chapter and section reference re-numbering and correlation requirement throughout the I-codes that would be a possible source of confusion and future errata.

Assembly Action:

None

**PART XII —IZC
Committee Action:**

Approved as Modified

Replace the proposal with the following:

**CHAPTER 1
SCOPE AND ADMINISTRATION**

Part 1 – Scope and Application

**SECTION 101
GENERAL**

**~~SECTION 102~~ 102
EXISTING BUILDINGS AND USES**

Part 2 – Administration and Enforcement

**~~SECTION 103~~ 103
DUTIES AND POWERS OF THE ZONING CODE OFFICIAL**

**~~SECTION 104~~ 104
PLANNING COMMISSION**

**~~SECTION 105~~ 105
COMPLIANCE WITH THE CODE**

**~~SECTION 106~~ 106
BOARD OF ADJUSTMENT**

**~~SECTION 107~~ 107
HEARING EXAMINER**

**~~SECTION 108~~ 108
HEARINGS, APPEALS AND AMENDMENTS**

**SECTION ~~140-109~~
VIOLATIONS**

**SECTION ~~144-110~~
PERMITS AND APPROVALS**

**SECTION ~~102-111~~
FEES**

Committee Reason: The committee agreed that separating scoping and application provisions from administrative provisions within Chapter 1 of the IZC was appropriate and allowed for jurisdictions to modify the administrative provisions as required by their local laws while easily retaining the scoping, application and intent provisions of the code. The modification allows for two separate parts versus two separate Chapters. This modification eliminates a massive chapter and section reference re-numbering requirement throughout the I-codes that would be a possible source of confusion and future errata.

Assembly Action:

None

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted for Part I.

Public Comment:

Lawrence Brown, CBO, National Association of Home Builders, requests Approval as Modified by this public comment for Part I.

Replace proposal with the following:

**CHAPTER 1
SCOPE AND ADMINISTRATION**

Part 1 – Scope and Application

**SECTION 101
GENERAL**

**SECTION 102
APPLICABILITY**

Part 2 – Administration and Enforcement

**SECTION 103
DEPARTMENT OF BUILDING SAFETY**

**SECTION 104
DUTIES AND POWERS OF BUILDING OFFICIAL**

**SECTION 105
PERMITS
SECTION 106
CONSTRUCTION DOCUMENTS**

**SECTION 107
TEMPORARY STRUCTURES AND USES**

**SECTION 108
FEES**

**SECTION 109
INSPECTIONS**

**SECTION 110
CERTIFICATE OF OCCUPANCY**

**SECTION 111
SERVICE UTILITIES**

**SECTION 112
BOARD OF APPEALS**

SECTION 113
VIOLATIONSSECTION 114
STOP WORK ORDERSECTION 115
UNSAFE STRUCTURES AND EQUIPMENT

Commenter's Reason: This modification will provide correlation with the modifications accepted by the eleven Code Committees on Parts 2 through 12 of this Proposal. As I was testifying at the other hearing track I was not able to present this modification the IBC-General Code Committee.

Final Hearing Results

G221-06/07, Part I	AMPC1
G221-06/07, Part II	AM
G221-06/07, Part III	AM
G221-06/07, Part IV	AM
G221-06/07, Part V	AM
G221-06/07, Part VI	AM
G221-06/07, Part VII	AM
G221-06/07, Part VIII	AM
G221-06/07, Part IX	AM
G221-06/07, Part X	AM
G221-06/07, Part XI	AM
G221-06/07, Part XII	AM

Code Change No: G222-06/07

Original Proposal

Sections: 106.1, 106.1.1, 106.1.1.1, 106.1.2, 106.1.3, 106.2, 106.3, 106.3.4.2; IEBC 106.1, 106.1.1, 106.1.1.1, 106.1.2, 106.1.3, 106.2, 106.3, 106.3.4; IRC R106.1, R106.1.1, R106.2, R106.3,

Proponent: Philip Brazil, P.E., Reid Middleton, Inc., representing the Washington Association of Building Officials

THIS PROPOSAL IS ON THE AGENDA OF THE IBC GENERAL, IEBC AND IRC BUILDING/ENERGY CODE DEVELOPMENT COMMITTEES. SEE THE TENTATIVE HEARING ORDER FOR THESE COMMITTEES.

PART I – IBC

Revise as follows:

**SECTION 106
CONSTRUCTION SUBMITTAL DOCUMENTS**

106.1 Submittal documents. General. Submittal documents consisting of Cconstruction documents, statement of special inspections and other data shall be submitted in one or more sets with each permit application. The construction documents shall be prepared by a registered design professional where required by the statutes of the jurisdiction in which the project is to be constructed. Where special conditions exist, the building official is authorized to require additional construction documents to be prepared by a registered design professional.

Exception: The building official is authorized to waive the submission of construction documents and other data not required to be prepared by a registered design professional if it is found that the nature of the work applied for is such that review of construction documents is not necessary to obtain compliance with this code.

106.2 Construction documents. Construction documents shall be in accordance with Sections 106.2.1 through 106.2.5

106.1.1 Information on 106.2.1 Quality of construction documents. Construction documents shall be dimensioned and drawn upon suitable material. Electronic media documents are permitted to be submitted when approved by the building official. Construction documents shall be of sufficient clarity to indicate the location, nature and extent of the work proposed and show in detail that it will conform to the provisions of this code and relevant laws, ordinances, rules and regulations, as determined by the building official.

106.1.1.1 106.2.2 Fire protection system shop drawings. Shop drawings for the fire protection system(s) shall be submitted to indicate conformance with this code and the construction documents and shall be approved prior to the start of system installation. Shop drawings shall contain all information as required by the referenced installation standards in Chapter 9.

106.1.2 106.2.3 Means of egress. The construction documents shall show in sufficient detail the location, construction, size and character of all portions of the means of egress in compliance with the provisions of this code. In other than occupancies in Groups R-2, R-3, and I-1, the construction documents shall designate the number of occupants to be accommodated on every floor, and in all rooms and spaces.

106.1.3 106.2.4 Exterior wall envelope. Construction documents for all buildings shall describe the exterior wall envelope in sufficient detail to determine compliance with this code. The construction documents shall provide details of the exterior wall envelope as required, including flashing, intersections with dissimilar materials, corners, end details, control joints, intersections at roof, eaves or parapets, means of drainage, water-resistive membrane and details around openings.

The construction documents shall include manufacturer's installation instructions that provide supporting documentation that the proposed penetration and opening details described in the construction documents maintain the weather resistance of the exterior wall envelope. The supporting documentation shall fully describe the exterior wall system which was tested, where applicable, as well as the test procedure used.

106.2 106.2.5 Site plan. The construction documents submitted with the application for permit shall be accompanied by a site plan showing to scale the size and location of new construction and existing structures on the site, distances from lot lines, the established street grades and the proposed finished grades and, as applicable, flood hazard areas, floodways, and design flood elevations; and it shall be drawn in accordance with an accurate boundary line survey. In the case of demolition, the site plan shall show construction to be demolished and the location and size of existing structures and construction that are to remain on the site or plot. The building official is authorized to waive or modify the requirement for a site plan when the application for permit is for alteration or repair or when otherwise warranted.

106.3 Examination of documents. The building official shall examine or cause to be examined the accompanying ~~construction~~ submittal documents and shall ascertain by such examinations whether the construction indicated and described is in accordance with the requirements of this code and other pertinent laws or ordinances.

106.3.4.2 Deferred submittals. For the purposes of this section, deferred submittals are defined as those portions of the design that are not submitted at the time of the application and that are to be submitted to the building official within a specified period.

Deferral of any submittal items shall have the prior approval of the building official. The registered design professional in responsible charge shall list the deferred submittals on the construction documents for review by the building official.

Documents for deferred submittal items shall be submitted to the registered design professional in responsible charge who shall review them and forward them to the building official with a notation indicating that the deferred submittal documents have been reviewed and been found to be in general conformance to the design of the building. The deferred submittal items shall not be installed until the ~~design and~~ deferred submittal documents have been approved by the building official.

PART II – IEBC

Revise as follows:

**SECTION 106
CONSTRUCTION SUBMITTAL DOCUMENTS**

106.1 Submittal documents. General. Submittal documents consisting of ~~C~~construction documents special inspection and structural observation programs, investigation and evaluation reports, and other data shall be submitted in one or more sets with each application for a permit. The construction documents shall be prepared by a

registered design professional where required by the statutes of the jurisdiction in which the project is to be constructed. Where special conditions exist, the code official is authorized to require additional construction documents to be prepared by a registered design professional.

Exception: The code official is authorized to waive the submission of construction documents and other data not required to be prepared by a registered design professional if it is found that the nature of the work applied for is such that reviewing of construction documents is not necessary to obtain compliance with this code.

106.2 Construction documents. Construction documents shall be in accordance with Sections 106.2.1 through 106.2.5

~~106.1.1~~ 106.2.1 Quality of construction documents. Construction documents shall be dimensioned and drawn upon suitable material. Electronic media documents are permitted to be submitted when approved by the code official. Construction documents shall be of sufficient clarity to indicate the location, nature, and extent of the work proposed and show in detail that it will conform to the provisions of this code and relevant laws, ordinances, rules, and regulations, as determined by the code official. The work areas shall be shown.

~~106.1.1.1~~ 106.2.2 Fire protection system shop drawings. Shop drawings for the fire protection system(s) shall be submitted to indicate conformance with this code and the construction documents and shall be approved prior to the start of system installation. Shop drawings shall contain all information as required by the referenced installation standards in Chapter 9 of the *International Building Code*.

~~106.1.2~~ 106.2.3 Means of egress. The construction documents for alterations Level 2, alterations Level 3, additions, and changes of occupancy shall show in sufficient detail the location, construction, size, and character of all portions of the means of egress in compliance with the provisions of this code. The construction documents shall designate the number of occupants to be accommodated in every work area of every floor and in all affected rooms and spaces.

~~106.1.3~~ 106.2.4 Exterior wall envelope. Construction documents for all work affecting the exterior wall envelope shall describe the exterior wall envelope in sufficient detail to determine compliance with this code. The construction documents shall provide details of the exterior wall envelope as required, including windows, doors, flashing, intersections with dissimilar materials, corners, end details, control joints, intersections at roof, eaves, or parapets, means of drainage, water-resistive membrane, and details around openings.

The construction documents shall include manufacturer's installation instructions that provide supporting documentation that the proposed penetration and opening details described in the construction documents maintain the wind and weather resistance of the exterior wall envelope. The supporting documentation shall fully describe the exterior wall system which was tested, where applicable, as well as the test procedure used.

106.2.5 Site plan. The construction documents submitted with the application for permit shall be accompanied by a site plan showing to scale the size and location of new construction and existing structures on the site, distances from lot lines, the established street grades, and the proposed finished grades; and it shall be drawn in accordance with an accurate boundary line survey. In the case of demolition, the site plan shall show construction to be demolished and the location and size of existing structures and construction that are to remain on the site or plot. The code official is authorized to waive or modify the requirement for a site plan when the application for permit is for alteration, repair, or change of occupancy.

106.3 Examination of documents. The code official shall examine or cause to be examined the ~~construction~~ submittal documents and shall ascertain by such examinations whether the construction or occupancy indicated and described is in accordance with the requirements of this code and other pertinent laws or ordinances.

106.3.4 Deferred submittals. For the purposes of this section, deferred submittals are defined as those portions of the design that are not submitted at the time of the application and that are to be submitted to the code official within a specified period.

Deferral of any submittal items shall have the prior approval of the code official. The registered design professional in responsible charge shall list the deferred submittals on the construction documents for review by the code official.

Submittal documents for deferred submittal items shall be submitted to the registered design professional in responsible charge who shall review them and forward them to the code official with a notation indicating that the deferred submittal documents have been reviewed and that they have been found to be in general conformance to the design of the building. The deferred submittal items shall not be installed until their ~~design and~~ deferred submittal documents have been approved by the code official.

PART III – IRC

Revise as follows:

**SECTION 106
CONSTRUCTION SUBMITTAL DOCUMENTS**

R106.1 Submittal documents. General. Submittal documents consisting of construction documents, special inspection and structural observation programs and other data shall be submitted in one or more sets with each application for a permit. The construction documents shall be prepared by a registered design professional where required by the statutes of the jurisdiction in which the project is to be constructed. Where special conditions exist, the building official is authorized to require additional construction documents to be prepared by a registered design professional.

Exception: The building official is authorized to waive submission of construction documents and other data required to be prepared by a registered design professional if it is found that the nature of the work applied for is that reviewing of construction documents is not necessary to obtain compliance with this code.

R106.2 Construction documents. Construction documents shall be in accordance with Sections R106.2.1 through R106.2.2

R106.1.4 R106.2.1 Information on Quality of construction documents. Construction documents shall be drawn upon suitable material. Electronic media documents are permitted to be submitted when approved by the building official. Construction documents shall be of sufficient clarity to indicate the location, nature and extent of the work proposed and show in detail that it will conform to the provisions of this code and relevant laws, ordinances, rules and regulations, as determined by the building official.

R106.2.2 Site plan. The construction documents submitted with the application for permit shall be accompanied by a site plan showing the size and location of new construction and existing structures on the site and distances from lot lines. In the case of demolition, the site plan shall show construction to be demolished and the location and size of existing structures and construction that are to remain on the site or plot.

R106.3 Examination of documents. The building official shall examine or cause to be examined submittal ~~construction~~ documents for code compliance.

(Renumber subsequent sections)

Reason: The proposed revisions are in conjunction with a related code change proposal on design data. Their purpose is to better distinguish between submittal documents and construction documents as well as give equal weight to each segment of the requirements for documentation in the construction documents. Note that Section 106.1 refers to construction documents, the statement of special inspections, and other data submitted with each application for a permit. Section 106.3 is proposed for revision to clarify that examination of documents by the building official is not limited to construction documents. It may also include examination of the statement of special inspections and other data as specified in Section 106.1. Note that Section 106.3.4.1 requires the registered design professional in responsible charge to review and coordinate the submittal documents prepared by others, including phased and deferred submittal items. The replacement of “design and” with “deferred” in Section 106.3.4.2 is proposed to clarify that deferred submittal items shall not be installed until the building official has approved by deferred submittal documents for them.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

PART I CIBC GENERAL

Committee Action:

Approved as Modified

Modify the proposal as follows:

106.2.1 Information on Quality of construction documents. Construction documents shall be dimensioned and drawn upon suitable material. Electronic media documents are permitted to be submitted when approved by the building official. Construction documents shall be of sufficient clarity to indicate the location, nature and extent of the work proposed and show in detail that it will conform to the provisions of this code and relevant laws, ordinances, rules and regulations, as determined by the building official.

(Portions of proposal not shown remain unchanged)

Committee Reason: Clarifies difference between construction documents and submittal documents. The modification simply revises the title in new Section 106.2.1 to Information on® from the proposed AQuality of® based on a committee preference of terminology. It should be noted that section titles are considered editorial.

Assembly Action:

None

**PART II C IEBC
Committee Action:**

Approved as Modified

Modify the proposal as follows:

106.2.1 Quality of Construction documents. Construction documents shall be dimensioned and drawn upon suitable material. Electronic media documents are permitted to be submitted when approved by the code official. Construction documents shall be of sufficient clarity to indicate the location, nature, and extent of the work proposed and show in detail that it will conform to the provisions of this code and relevant laws, ordinances, rules, and regulations, as determined by the code official. The work areas shall be shown.

(Portions of proposal not shown remain unchanged)

Committee Reason: The committee agreed that this change provided clarity in that it better distinguished between submittal documents and construction documents. Further, this change delineated the requirements for documentation for construction documents. The modification was to provide consistency between I-codes based on the actions of other code committees on similar changes.

Assembly Action:

None

**PART III C IRC
Committee Action:**

Disapproved

Committee Reason: The committee felt that the language presented in this code change proposal was already contained in the current code text and that the new language was an unnecessary reorganization.

Assembly Action:

None

Final Hearing Results

G222-06/07, Part I	AM
G222-06/07, Part II	AM
G222-06/07, Part III	D

Code Change No: G223-06/07

Original Proposal

Sections: 506.2.1, 506.3, 507.3, 1013.1, 3104.3**Proponent:** Philip Brazil, PE, Reid Middleton, Inc., representing himself**Revise as follows:**

506.2.1 Width limits. ~~The value of "W" must shall~~ be at least 20 feet (6096 mm). Where the value of W varies along the perimeter of the building, the calculation performed in accordance with Equation 5-2 shall be based on the weighted average of each portion of exterior wall and open space where the value of W is greater than or equal to 20 feet (6096 mm). Where the value of W exceeds 30 feet (9144 mm), a value of 30 feet (9144 mm) shall be used in calculating the weighted average, regardless of the actual width of the open space.

Exception: The quantity value of W divided by 30 shall be permitted to be a maximum of 2 when the building meets all requirements of Section 507 except for compliance with the 60-foot (18 288 mm) public way or yard requirement, as applicable.

506.3 Automatic sprinkler system increase. Where a building is equipped throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.1, the area limitation in Table 503 is permitted to be increased by an additional 200 percent ($I_s = 2$) for buildings with more than one story above grade plane and an additional 300 percent ($I_s = 3$) for buildings with no more than one story above grade plane. These increases are permitted in addition to the height and story increases in accordance with Section 504.2.

Exception: The area limitation increases shall not be permitted for the following conditions:

1. The automatic sprinkler system increase shall not apply to buildings with an occupancy in Use Group H-1.
2. The automatic sprinkler system increase shall not apply to the ~~floor~~ building area of an occupancy in Use Group H-2 or H-3. For ~~mixed-use~~ buildings containing such occupancies, the allowable area shall be ~~calculated~~ determined in accordance with Section 508.3.3.2, with the sprinkler system increase applicable only to the portions of the building not classified as Use Group H-2 or H-3.
3. Fire-resistance rating substitution in accordance with Table 601, Note e.

3. Revise as follows:

507.3 Sprinklered, one story. The area of a one-story, Group B, F, M or S building, or a one-story Group A-4 building, of other than Type V construction, shall not be limited when the building is provided with an automatic sprinkler system throughout in accordance with Section 903.3.1.1 and is surrounded and adjoined by public ways or yards not less than 60 feet (18 288 mm) in width.

Exceptions:

1. Buildings and structures of Type I and II construction for rack storage facilities that do not have access by the public shall not be limited in height, provided that such buildings conform to the requirements of Sections 507.2 and 903.3.1.1 and NFPA 230.
2. The automatic sprinkler system shall not be required in areas occupied for indoor participant sports, such as tennis, skating, swimming and equestrian activities in occupancies in Group A-4, provided that:
 - 2.1. Exit doors directly to the outside are provided for occupants of the participant sports areas; and
 - 2.2. The building is equipped with a fire alarm system with manual fire alarm boxes installed in accordance with Section 907.
3. Group A-1 and A-2 occupancies of other than Type V construction shall be permitted, provided:
 - 3.1. All assembly occupancies are separated from other spaces as required for separated ~~uses~~ occupancies in Section 508.3.3.4 with no reduction allowed in the fire-resistance rating of the separation based upon the installation of an automatic sprinkler system;
 - 3.2. Each Group A occupancy shall not exceed the maximum allowable area permitted in Section 503.1; and
 - 3.3. All required exits shall discharge directly to the exterior.

4. Revise as follows:

1013.1 Where required. Guards shall be located along open-sided walking surfaces, mezzanines, ~~industrial~~ equipment platforms, stairways, ramps and landings that are located more than 30 inches (762 mm) above the floor or grade below. Guards shall be adequate in strength and attachment in accordance with Section 1607.7. Where glass is used to provide a guard or as a portion of the guard system, the guard shall also comply with Section 2407. Guards shall also be located along glazed sides of stairways, ramps and landings that are located more than 30 inches (762 mm) above the floor or grade below where the glazing provided does not meet the strength and attachment requirements in Section 1607.7.

Exception: Guards are not required for the following locations:

1. On the loading side of loading docks or piers.
2. On the audience side of stages and raised platforms, including steps leading up to the stage and raised platforms.
3. On raised stage and platform floor areas, such as runways, ramps and side stages used for entertainment or presentations.
4. At vertical openings in the performance area of stages and platforms.
5. At elevated walking surfaces appurtenant to stages and platforms for access to and utilization of special lighting or equipment.
6. Along vehicle service pits not accessible to the public.
7. In assembly seating where guards in accordance with Section 1025.14 are permitted and provided.

5. Revise as follows:

3104.3 Construction. The pedestrian walkway shall be of noncombustible construction.

Exceptions:

1. Combustible construction shall be permitted where connected buildings are of combustible construction.
2. Fire-retardant-treated wood, in accordance with Table 601, Note e-d, shall be permitted for the roof construction of the pedestrian walkway where connected buildings are ~~a minimum of~~ Type I or II construction.

Reason:

1. Internal consistency with revisions approved by code change proposal G113-04/05(AM).
2. Consistency with revisions approved by code change proposal G14-04/05(AMPC1) plus editorial suggestions.
3. Consistency with revisions approved by code change proposal G14-04/05(AMPC1).
4. Consistency with the other deletions approved by code change proposal G88-04/05(AS).
5. First change is for consistency with revisions approved by code change proposal G158-04/05(AMPC1). Second change is because the phrase is superfluous.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:**Disapproved**

Committee Reason: Based upon proponents request. See committee reason for G10-06/07

Assembly Action:**None**

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Philip Brazil, PE, Reid Middleton, Inc., representing himself requests Approval as Modified by this public comment.

Replace proposal with the following:

506.2.1 Width limits. ~~The value of "W" must~~ shall be at least 20 feet (6096 mm). Where the value of *W* varies along the perimeter of the building, the calculation performed in accordance with Equation 5-2 shall be based on the weighted average of each portion of exterior wall and open space where the value of *W* is greater than or equal to 20 feet (6096 mm). Where ~~the value of~~ *W* exceeds 30 feet (9144 mm), a value of 30 feet (9144 mm) shall be used in calculating the weighted average, regardless of the actual width of the open space.

Exception: The ~~quantity value~~ value of *W* divided by 30 shall be permitted to be a maximum of 2 when the building meets all requirements of Section 507 except for compliance with the 60-foot (18 288 mm) public way or yard requirement, as applicable.

506.3 Automatic sprinkler system increase. Where a building is equipped throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.1, the area limitation in Table 503 is permitted to be increased by an additional 200 percent (*I*s = 2) for buildings with more than one story above grade plane and an additional 300 percent (*I*s = 3) for buildings with no more than one story above grade plane. These increases are permitted in addition to the height and story increases in accordance with Section 504.2.

Exception: The area limitation increases shall not be permitted for the following conditions:

1. The automatic sprinkler system increase shall not apply to buildings with an occupancy in ~~Use~~ Group H-1.
2. The automatic sprinkler system increase shall not apply to the ~~floor building~~ area of an occupancy in ~~Use~~ Group H-2 or H-3. For ~~mixed-use~~ buildings containing such occupancies, the allowable area shall be ~~calculated~~ **determined** in accordance with Section 508.3.3.2, with the sprinkler ~~system~~ increase applicable only to the portions of the building not classified as ~~Use~~ Group H-2 or H-3.
3. Fire-resistance rating substitution in accordance with Table 601, Note e.

507.3 Sprinklered, one story. The area of a one-story, Group B, F, M or S building, or a one-story Group A-4 building, of other than Type V construction, shall not be limited when the building is provided with an automatic sprinkler system throughout in accordance with Section 903.3.1.1 and is surrounded and adjoined by public ways or yards not less than 60 feet (18 288 mm) in width.

Exceptions:

1. Buildings and structures of Type I and II construction for rack storage facilities that do not have access by the public shall not be limited in height, provided that such buildings conform to the requirements of Sections 507.2 and 903.3.1.1 and NFPA 230.

2. The automatic sprinkler system shall not be required in areas occupied for indoor participant sports, such as tennis, skating, swimming and equestrian activities in occupancies in Group A-4, provided that:
 - 2.1. Exit doors directly to the outside are provided for occupants of the participant sports areas; and
 - 2.2. The building is equipped with a fire alarm system with manual fire alarm boxes installed in accordance with Section 907.
3. Group A-1 and A-2 occupancies of other than Type V construction shall be permitted, provided:
 - 3.1. All assembly occupancies are separated from other spaces as required for separated ~~uses~~ occupancies in Section 508.3.3.4 with no reduction allowed in the fire-resistance rating of the separation based upon the installation of an automatic sprinkler system;
 - 3.2. Each Group A occupancy shall not exceed the maximum allowable area permitted in Section 503.1; and
 - 3.3. All required exits shall discharge directly to the exterior.

1013.1 Where required. Guards shall be located along open-sided walking surfaces, mezzanines, ~~industrial~~ equipment platforms, stairways, ramps and landings that are located more than 30 inches (762 mm) above the floor or grade below. Guards shall be adequate in strength and attachment in accordance with Section 1607.7. Where glass is used to provide a guard or as a portion of the guard system, the guard shall also comply with Section 2407. Guards shall also be located along glazed sides of stairways, ramps and landings that are located more than 30 inches (762 mm) above the floor or grade below where the glazing provided does not meet the strength and attachment requirements in Section 1607.7.

Exception: Guards are not required for the following locations:

1. On the loading side of loading docks or piers.
2. On the audience side of stages and raised platforms, including steps leading up to the stage and raised platforms.
3. On raised stage and platform floor areas, such as runways, ramps and side stages used for entertainment or presentations.
4. At vertical openings in the performance area of stages and platforms.
5. At elevated walking surfaces appurtenant to stages and platforms for access to and utilization of special lighting or equipment.
6. Along vehicle service pits not accessible to the public.
7. In assembly seating where guards in accordance with Section 1025.14 are permitted and provided.

Commenter's Reason: At the 2006/2007 ICC code development hearings in Orlando, I agreed to ask for disapproval in conjunction with the initiative by several organizations to pursue resolution to the ongoing differences over the IBC provisions for allowable building heights and building areas, specifically through the efforts of the ICC Code Technology Committee. At the time of the deadline to submit public comments for consideration at the final action hearings in Rochester, that effort was ongoing. Consequently, I am asking for approval as submitted, except for Item #5, based on the original reason statement.

I am requesting the membership disregard Item #5 because my understanding at the time of the deadline for submittal of public comments was that Section 3104.3, Exception 2, will be corrected by ICC errata.

Staff note: Please note that the errata to Section 3104.3 which will be corrected in the 3rd printing of the 2006 IBC is as follows:

3104.3 Construction. The pedestrian walkway shall be of noncombustible construction.

Exceptions:

1. Combustible construction shall be permitted where connected buildings are of combustible construction.
2. Fire-retardant-treated wood, in accordance with ~~Table 601, Note c~~ Section 603.1, Item 1.3, shall be permitted for the roof construction of the pedestrian walkway where connected buildings are a minimum of Type I or II construction.

Final Hearing Results

G223-06/07

AMPC1

Code Change No: **G224-06/07**

Original Proposal

Chapter 35

Proponent: Standards writing organizations as listed below.

Revise standards as follows:

ASTM

ASTM International
100 Barr Harbor Drive
West Conshocken, PA 19428-2959

Standard reference number	Title
C 94/C 94M-05 04	Specification for Ready-mixed Concrete
D 56-05 02a	Test Method for Flash Point by Tag Closed Tester
D 86-05 04b	Test Method for Distillation of Petroleum Products at Atmospheric Pressure
E 84-05e01 04	Test Methods for Surface Burning Characteristics of Building Materials
E 96-96M-05 00e04	Test Method for Water Vapor Transmission of Materials
E 108-05 04	Test Methods for Fire Tests of Roof Coverings

NFPA

National Fire Protection Association
1 Batterymarch Park
Quincy, MA 02269-9101

Standard reference number	Title
10-02	Portable
32-04 00	Dry Cleaning Plants
101-06 03	Life Safety Code
110-05 02	Emergency and Standby Power Systems
111-05 04	Stored Electrical Energy Emergency and Standby Power Systems
120-04 99	Coal Preparation Plants
253-06 00	<u>Standard Method of Test</u> for Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source
409-04 04	Aircraft Hangars
418-06 04	Heliports
484-06 02	Combustible Metals, Metal Powders and Metal Dusts
654-00 06	Prevention of Fire & Dust Explosions from the Manufacturing, Processing and Handling of Combustible Particulate Solids
701-04 99	Methods of Fire Tests for Flame Propagation of Textiles and Films
1124-06 03	Manufacture, Transportation, Storage and Retail Sales of Fireworks and Pyrotechnic Articles

Reason: The *ICC Code Development Process for the International Codes (Procedures)* Section 4.5* requires the updating of referenced standards to be accomplished administratively, and be processed as a Code Proposal. In May 2005, a letter was sent to each developer of standards that are referenced in the I-Codes, asking them to provide ICC with a list of their standards in order to update to the current edition. Above is the list received of the referenced standards under the maintenance responsibility of the IBC General Committee.

CODE CHANGES RESOURCE COLLECTION – INTERNATIONAL BUILDING CODE

***4.5 Updating Standards:** The updating of standards referenced by the Codes shall be accomplished administratively by the appropriate code development committee in accordance with these full procedures except that multiple standards to be updated may be included in a single proposal.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: Appropriately updates to most current edition of referenced standards within the IBC for sections related to the General Building Code requirements.

Assembly Action:

None

Final Hearing Results

G224-06/07

AS

IBC – MEANS OF EGRESS

Code Change No: **E5-06/07**

Original Proposal

Sections: 1002.1 (IFC [B] 1002.1)

Proponent: Marshall A. Klein, P.E., Marshall A. Klein & Associates, Inc.

Revise definition as follows:

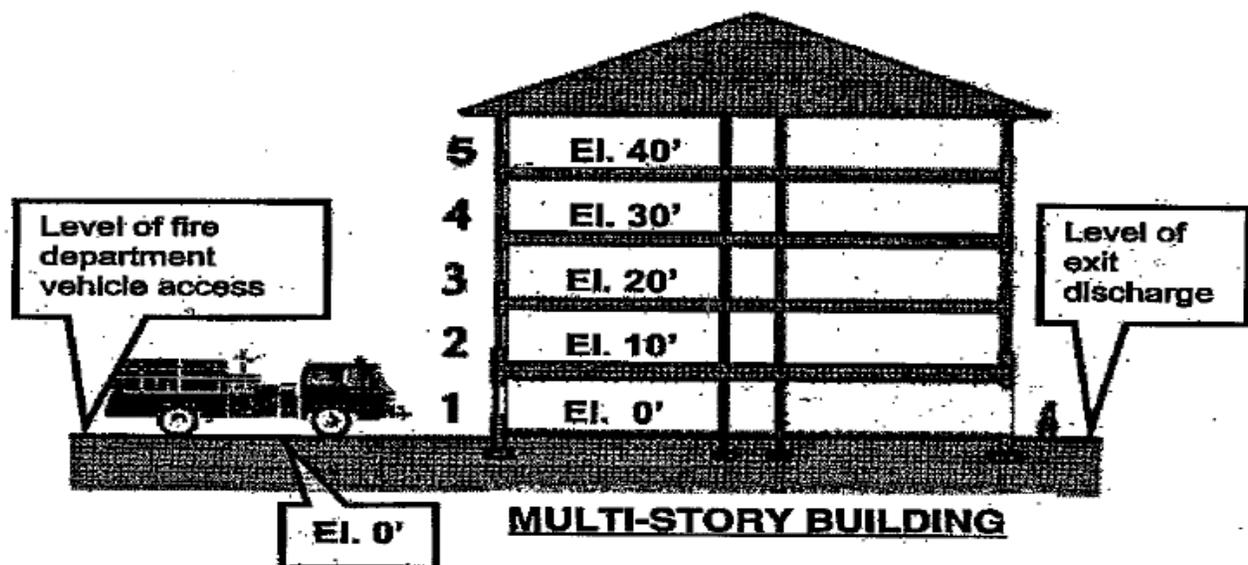
1002.1 Definitions. The following words and terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

EXIT DISCHARGE, LEVEL OF. The horizontal plane located lowest story at the point at which an exit terminates and an exit discharge begins.

Reason: IFC Formal Interpretations 44-03, 26-03, & 25-03, all issued on 5/11/04, stated the following:

“When determining stories above the lowest level of exit discharge, a level, or floor level, is not a story. A “level” is the horizontal plane that is part of a story, not the entire story height. A “story” is the vertical space between the upper surface of one floor level and the upper surface of the floor level next above or below.”

The level of exit discharge as shown in the attached drawing of a Multi-Story Building is at elevation 0.0', the first floor level of the building is also at elevation 0.0'; therefore, the level of exit discharge and the first floor level of the building are at the same elevation. The first story of the building begins at elevation 0.0' (first floor) and extends to the elevation 10.0' (second floor). The first story of the building is the first story above the level of exit discharge.”



The intent of the “level of exit discharge” definitions in the previous three legacy codes, and in the ICC Codes was to use a similar definition for “level of exit discharge” as was being used in the NFPA 101, “Life Safety Code”, which originally defined this term. Such similar definitions for “level of exit discharged” correlated between model codes and the NFPA Standards for user friendliness. For reference, 2006 NFPA 101 (LSC) defines “level of exit discharge”:

CODE CHANGES RESOURCE COLLECTION – INTERNATIONAL BUILDING CODE

"3.3.72.1 Level of Exit Discharge. (1) The lowest story from which not less than 50 percent of the required number of exits and not less than 50 percent of the required egress capacity from such a story discharge directly outside at grade; (2) the story with the smallest elevation change needed to reach grade where no story has 50 percent or more of the required number of exits and 50 percent or more of the required egress capacity from such a story discharge directly outside at grade."

The major difference between the IFC formal interpretations and the NFPA 101 definition is that NFPA 101 defines the "level of exit discharge" as a volume (story), not as a "horizontal plane". Therefore, in the diagram of the multistory building above, the "first story above the level of exit discharge" under NFPA 101 (and for that matter, as used under the legacy codes) was always considered the second story (El. 10'). However, under the IFC Formal Interpretations, it is now the first story (El. 0').

These formal IFC interpretations have been a rude awakening for many experienced users of the Codes, in particular to some ICC Staff members. Since a different ICC Committee, other than the ICC Means of Egress Code Development Committee, made these interpretations, this code proposal is providing the Means of Egress Code Development Committee its opportunity to "weigh in" on the intent of the Code when it comes to application of this definition.

This code proposal is only attempting to correlate the definition for "level of exit discharge" with the definition in NFPA 101, where the "level of exit discharge" concept came from. I believe that the NFPA 101 definition is a little too wordy for the ICC Codes. My proposed wording appears more than adequate to work for the ICC Codes, and to correlate between the ICC and NFPA Codes.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Modified

Modify the proposal as follows:

EXIT DISCHARGE, LEVEL OF. The lowest story at the point at which an exit terminates and an exit discharge begins.

Committee Reason: The revised language will clarify that the level of exit discharge is the story the occupants are egressing from rather than the floor they are walking on. The modification was made because the story could be the lowest, highest or any level of building.

Assembly Action:

None

Final Hearing Results

E5-06/07

AM

Code Change No: E6-06/07

Original Proposal

Sections: 1002 (New) [IFC [B] 1002 (New)]; IRC R202

Proponent: David W. Cooper, Stairway Manufacturers' Association

THIS PROPOSAL IS ON THE AGENDA OF THE IBC MEANS OF EGRESS AND THE IRC BUILDING/ENERGY CODE DEVELOPMENT COMMITTEES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IBC

Add new definition as follows:

1002.1 Definitions. The following words and terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

FLIGHT. A continuous run of rectangular treads (fliers) or winders or combination thereof from one landing to another.

PART II – IRC

Add new definition to Section R202 as follows:

FLIGHT. A continuous run of rectangular treads (fliers) or winders or combination thereof from one landing to another.

Reason: The purpose of the change is to clarify the code. This proposal will foster a better understanding of what distinguishes a flight from a stairway. This definition is needed because the word "Flight" is used specifically to reference that part of a stairway that is between landings no less than 8 times in IBC 1009 and no less than 9 times in IRC 311.5. Often this word is misinterpreted to be stairs between *floors* causing the extending of handrails across landings, varying determinations of handrail continuity, dimensional uniformity, riser height, and tread depth. Furthermore this will help to clarify a major difference between winders and landings i.e., Landings separate flights within a stairway, winders are treads within a flight and are often combined with fliers in the same flight. Winders do not separate flights.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

PART I C IBC

Committee Action:

Approved as Modified

Modify the proposal as follows:

FLIGHT. A continuous run of rectangular treads (~~fliers~~) or winders or combination thereof from one landing to another.

Committee Reason: The definition will clarify the difference between ~~flight~~ and when a stairway moves from floor to floor. The term ~~fliers~~ was dropped because it was confusing, not commonly used and not needed.

Assembly Action:

None

PART II C IRC

Committee Action:

Approved as Modified

Modify the proposal as follows:

FLIGHT. A continuous run of rectangular treads (~~fliers~~) or winders or combination thereof from one landing to another.

Committee Reason: The definition of Flight is a useful addition to Chapter 2 of the *International Residential Code*. The modification was passed by the Means of Egress committee and keeps the definitions consistent in the IBC and IRC.

Assembly Action:

None

Final Hearing Results

E6-06/07, Part I

AM

E6-06/07, Part II

AM

Code Change No: **E8-06/07**

Original Proposal

Sections: 1003.2 (IFC [B] 1003.2)

Proponent: Bill Conner, Conner Associates LLC, representing himself

Revise as follows:

1003.2 Ceiling height. The means of egress shall have a ceiling height of not less than 7 feet 6 inches (2286 mm).

Exceptions:

1. Sloped ceilings in accordance with Section 1208.2.
2. Ceilings of dwelling units and sleeping units within residential occupancies in accordance with Section 1208.2.
3. Allowable projections in accordance with Section 1003.3.

4. Stair headroom in accordance with Section 1009.2.
5. Door height in accordance with Section 1008.1.1.
6. Ramp headroom in accordance with Section 1010.5.2.

Reason: For consistency Section 1003.2 should include ramps in headroom height exceptions. The change is also for coordination with ICC A117.1 Section 307.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: Ramps are part of the means of egress, and it is logical to include them in the exceptions for the ceiling height provisions. This will coordinate the IBC requirements with ICC A117.1.

Assembly Action:

None

Final Hearing Results

E8-06/07

AS

Code Change No: E11-06/07

Original Proposal

Sections: 1003.3.2, 1003.3.3, 1003.3.4 (IFC [B] 1003.3.2, [B] 1003.3.3, [B] 1003.3.4)

Proponent: Bill Conner, Conner Associates LLC, representing himself

Revise as follows:

1003.3.2 ~~Free-standing~~ Post mounted objects. A free-standing object mounted on a post or pylon shall not overhang that post or pylon more than 4 inches (102 mm) where the lowest point of the leading edge is more than 27 inches (686 mm) and less than 80 inches (2032 mm) above the walking surface. Where a sign or other obstruction is mounted between posts or pylons and the clear distance between the posts or pylons is greater than 12 inches (305 mm), the lowest edge of such sign or obstruction shall be 27 inches (685 mm) maximum or 80 inches (2030 mm) minimum above the finished floor or ground.

Exception: ~~This~~ These requirements shall not apply to sloping portions of handrails ~~servng~~ between the top and bottom riser of stairs and above the ramps run.

1003.3.3 Horizontal projections. Structural elements, fixtures or furnishings shall not project horizontally from either side more than 4 inches (102 mm) over any walking surface between the heights of 27 inches (686 mm) and 80 inches (2032 mm) above the walking surface.

Exception: Handrails ~~servng stairs and ramps~~ are permitted to protrude 4.5 inches (114 mm) from the wall.

1003.3.4 Clear width. Protruding objects shall not reduce the minimum clear width of accessible routes ~~as required in Section 1104.~~

Reason: The concern is to two fold: 1) Not to apply the provisions of Section 1003.3.2 to the portions of the handrails along the stair or ramp run, but to apply those provisions to the handrail extensions. (Ex: A handrail on posts on a grand stairway.) 2) To allow handrails to protrude from the wall but never get less than the 36" wide ramp or route required for accessibility. The change is also for coordination with ICC A117.1 Sections 405 and 307.3. The change to Section 1003.3.4 would cover accessible routes for the way in as well as the way out.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The proposal would add clarity on how to measure ramp width. The proposed language would increase coordination with the ICC A117.1 and new ADA/ABA Accessibility Guidelines.

Assembly Action:

None

Final Hearing Results

E11-06/07

AS

Code Change No: **E16-06/07**

Original Proposal

Table 1005.1 (IFC [B] Table 1005.1)

Proponent: Gregory R. Keith, Professional heuristic Development, representing The Boeing Company

Revise table as follows:

**TABLE 1005.1
EGRESS WIDTH PER OCCUPANT SERVED**

OCCUPANCY	WITHOUT SPRINKLER SYSTEM		WITH SPRINKLER SYSTEM ^a	
	Stairways (inches per occupant)	Other egress components (inches per occupant)	Stairways (inches per occupant)	Other egress components (inches per occupant)
Occupancies other than those listed below	0.3	0.2	0.2	0.15
Hazardous: H-1, H-2, H-3 and H-4	0.7 Not Permitted	0.4 Not Permitted	0.3	0.2
Institutional: I-2	NA Not Permitted	NA Not Permitted	0.3	0.2

For SI: 1 inch = 25.4 mm. NA = Not applicable.

- a. Buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2.

Reason: Table 1005.1 is somewhat misleading in that Group H-1, H-2, H-3 and H-4 occupancies are not permitted in buildings without a sprinkler system according to Section 903.2.4.1. The format of the Institutional occupancy cells has been changed to be consistent with other similar tables in Chapter 10 such as Tables 1016.1 and 1017.1 It should be noted that this proposal was disapproved by the Means of Egress Code Committee during the previous code development cycle. Their rationale for that action was that there are existing, unsprinklered Group H occupancies and those data need to be retained for existing building purposes. If this logic is valid, there are numerous tables and other IBC provisions that need to reflect former requirements. The primary purpose of the International Building Code is to govern the design and construction of new buildings and structures. Its requirements should reflect that purpose. The code in effect at the time an existing building was constructed would be a better reference for prior code requirements, should they be needed. Approval of this proposal would result in technical consistency of International Building Code provisions.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The proposed language would provide consistency and clarity to the code for Group H and I-2 requirements.

Assembly Action:

None

Final Hearing Results

E16-06/07

AS

Code Change No: E17-06/07

Original Proposal

Sections: 1005.2 (IFC [B] 1005.2)

Proponent: Ralph Vasami, The Kellen Company, representing The Door Safety Council

Revise as follows:

1005.2 Door encroachment. Doors opening into the path of egress travel shall not reduce the required width to less than one-half during the course of the swing. ~~When fully open,~~ Excluding hardware, the door shall not project more than 7 inches (178 mm) into the required width when fully opened.

Exception: The restrictions on a door swing shall not apply to doors within individual dwelling units and sleeping units of Group R-2 and dwelling units of Group R-3.

Reason: This proposal modifies text regarding door encroachment. The existing code language fails to address the issue of hardware that is required as part of the door assembly to satisfy egress and security requirements. The proposed language seeks to clarify the manner in which the *Door Encroachment* language is enforced. Hardware projections should not be part of the measurement as they do not materially reduce the corridor width or impede egress flow.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: Based on the testimony, if the hardware can be up to 10 inches from tip to tip, taking away the door and one handle, exclusion of the hardware could result in an additional protrusion of up to 11 inches into the path for means of egress. The 7 inches should include the hardware. In addition, when the door open 90 degrees, the 7 inches is the obstruction, while if it opens 180 degrees, there is credit given for the hardware so it is not a protrusion - this seems inconsistent.

Assembly Action:

None

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Ralph Vasami, The Kellen Company, representing The Door Safety Council, requests Approval as Modified by this public comment.

Replace proposal with the following:

1005.3 Door hardware encroachment. Surface-mounted latch release hardware shall be exempt from inclusion in the 7-inch maximum (178mm) projection requirement of 1005.2 when:

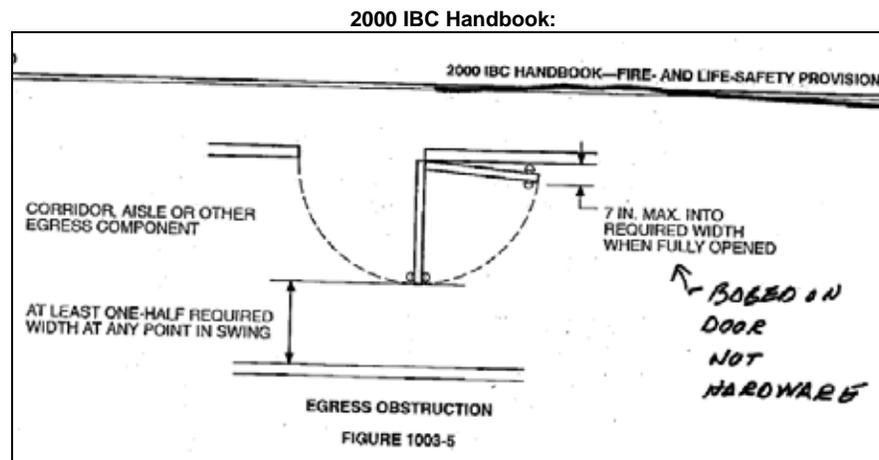
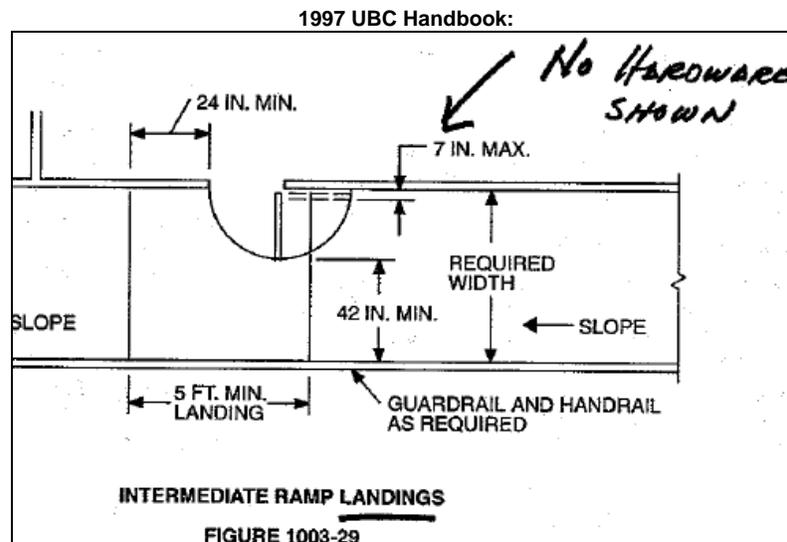
1. The hardware is mounted to the side of the door facing the corridor width when the door is in the open position and;
2. The hardware is mounted not less than 34 inches (865mm) nor more than 48 inches (1220mm) above the finished floor.

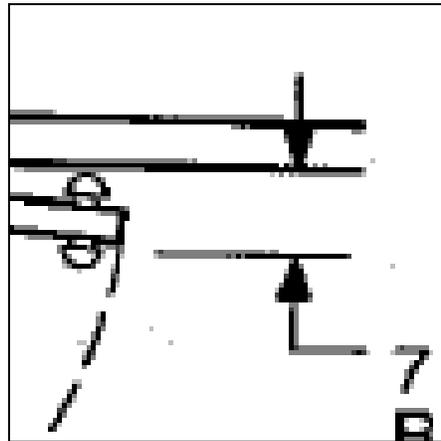
Commenter's Reason: The IFC and IBC requirements for door encroachment have not clearly addressed the issue of attached door latching hardware. The intent of the proposal as submitted was to clarify that door latching hardware should not be included in the dimensional requirement for door encroachment. The committee discussion and stated reasons for disapproval of E17 demonstrate the confusion surrounding this requirement. This public comment separates the door encroachment requirement from hardware, but adds restrictions on the height and mounting surface to capture the appropriate hardware encroachment prescriptions. The additional text is taken from NFPA 101 means of egress requirements.

The best illustration of just how confusing the current text is, and the best justification for this needed clarification, are the ICC Commentaries. The 7" door encroachment requirement is based upon legacy code provisions and has survived intact. In the *1997 UBC Handbook*, figure 1003-29 provides a detail with a dimension indicating a maximum of 7" door encroachment, but the figure shows no hardware and the dimension line leads to the edge of the door surface. Fast-forward to the *2000 IBC Handbook Fire and Life-safety Provisions* and to figure 1003-5. In this detail, hardware has been added to the illustration but the 7" dimension line has moved to some vague point between the door slab and the doorknob. In the *2003 IBC Commentary* Figure 1005.2, the detail has been modified to show accessible hardware instead of a doorknob, but the dimension line again leads to some vague spot on the door latch.

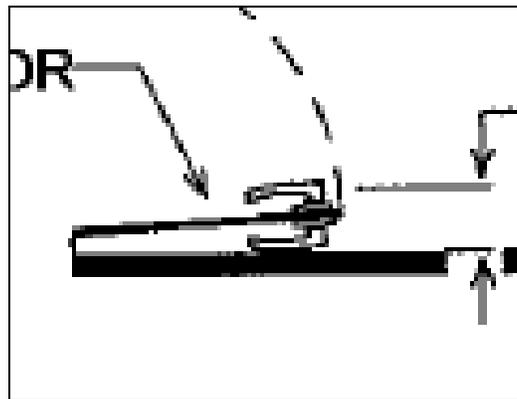
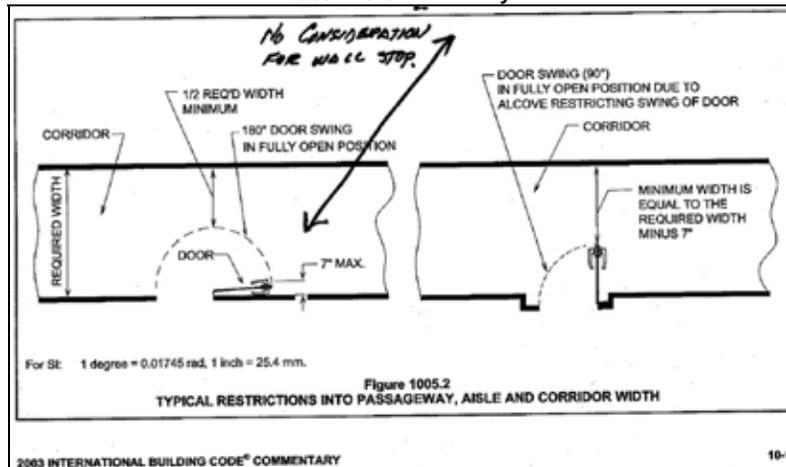
Despite the fact that the technical provision for door encroachment has not changed since the legacy codes, ICC artists have arbitrarily changed the details in the commentaries. The clarification provided by this proposal is necessary to clean up the ambiguity and resolve the issue in order to facilitate consistent code interpretations. The proposal is not a change in the requirement, merely a clarification made necessary by the confusion created by the ICC commentaries.

The following details are taken from the above referenced ICC and ICBO publications.





2003 IBC Commentary:



Final Hearing Results

E17-06/07

AMPC1

Code Change No: **E18-06/07**

Original Proposal

Sections: 1005.2, 1014.4, 1017.2, 1021.2, 1024.5.1 (IFC [B] 1005.2, [B] 1014.4, [B] 1017.2, [B] 1021.2, [B] 1024.5.1)

Proponent: Gregory R. Keith, Professional heuristic Development, representing The Boeing Company

Revise as follows:

1005.2 Door Encroachment. ~~Doors, when fully opened, and handrails, shall not reduce the required means of egress width by more than 7 inches (178 mm). Such door measurements shall include the thickness of the door and any hardware between the door and the adjacent wall surface. Doors in any position shall not reduce the required width by more than one-half. Other nonstructural projections such as trim and similar decorative features are permitted to project into the required width 1.5 inches (38 mm) on each side. Doors opening into the path of egress travel shall not reduce the required width to less than one-half during the course of the swing. When fully open, the door shall not project more than 7 inches (178 mm) into the required width.~~

Exception: The restrictions on a door swing shall not apply to doors within individual dwelling units and sleeping units of Group R-2 and dwelling units of Group R-3.

1014.4 Aisles. Aisles serving as a portion of the exit access in the means of egress system shall comply with the requirements of this section. Aisles shall be provided from all occupied portions of the exit access which contain seats, tables, furnishings, displays and similar fixtures or equipment. Aisles serving assembly areas, other than seating at tables, shall comply with Section 1025. Aisles serving reviewing stands, grandstands and bleachers shall also comply with Section 1025. The required width of aisles shall be unobstructed.

Exception: ~~Doors complying with Section 1005.2, when fully opened, and handrails shall not reduce the required width by more than 7 inches (178 mm). Doors in any position shall not reduce the required width by more than one-half. Other nonstructural projections such as trim and similar decorative features are permitted to project into the required width 1.5 inches (38 mm) from each side.~~

1017.2 Corridor width. The minimum corridor width shall be as determined in Section 1005.1, but not less than 44 inches (1118 mm).

Exceptions:

1. Twenty-four inches (610 mm)—For access to and utilization of electrical, mechanical or plumbing systems or equipment.
2. Thirty-six inches (914 mm)—With a required occupant capacity of less than 50.
3. Thirty-six inches (914 mm)—Within a dwelling unit.
4. Seventy-two inches (1829 mm)—In Group E with a corridor having a required capacity of 100 or more.
5. Seventy-two inches (1829 mm)—In corridors serving surgical Group I, health care centers for ambulatory patients receiving outpatient medical care, which causes the patient to be not capable of self-preservation.
6. Ninety-six inches (2438 mm)—In Group I-2 in areas where required for bed movement.

The required width of corridors shall be unobstructed.

Exception: Doors complying with Section 1005.2.

1021.2 Width. The width of exit passageways shall be determined as specified in Section 1005.1 but such width shall not be less than 44 inches (1118 mm), except that exit passageways serving an occupant load of less than 50 shall not be less than 36 inches (914 mm) in width. The required width of exit passageways shall be unobstructed.

Exception: ~~Doors complying with Section 1005.2, when fully opened, and handrails, shall not reduce the required width by more than 7 inches (178 mm). Doors in any position shall not reduce the required width by more than one-half. Other nonstructural projections such as trim and similar decorative features are permitted to project into the required width 1.5 inches (38 mm) on each side.~~

1024.5.1 Width. The width of egress courts shall be determined as specified in Section 1005.1, but such width shall not be less than 44 inches (1118 mm), except as specified herein. Egress courts serving Group R-3 and U occupancies shall not be less than 36 inches (914 mm) in width. The required width of egress courts shall be unobstructed to a height of 7 feet (2134 mm).

Exception: ~~Doors complying with Section 1005.2, when fully opened, and handrails shall not reduce the required width by more than 7 inches (178 mm). Doors in any position shall not reduce the required width by more than one-half. Other nonstructural projections such as trim and similar decorative features are permitted to project into the required width 1.5 inches (38 mm) from each side.~~

Where an egress court exceeds the minimum required width and the width of such egress court is then reduced along the path of exit travel, the reduction in width shall be gradual. The transition in width shall be affected by a guard not less than 36 inches (914 mm) in height and shall not create an angle of more than 30 degrees (0.52 rad) with respect to the axis of the egress court along the path of egress travel. In no case shall the width of the egress court be less than the required minimum.

Reason: Currently, there are no obstruction provisions for corridors in Section 1017. Section 1014.4 provides such criteria for aisles. Section 1021.2 provides such criteria for exit passageways. Section 1024.5.1 provides such criteria for egress courts. During the previous code development cycle, a similar proposal was disapproved by the means of egress code development committee. Their rationale was that the issue was already sufficiently addressed in the general provisions of Section 1005.2. Unfortunately, those general provisions are not as detailed as those encroachment provisions currently contained in the aforementioned means of egress component sections. Therefore, it is also proposed that Section 1005.2 be modified to be consistent with those component sections. Inasmuch as the required width encroachment provisions apply to more than doors, the section heading has been altered to reflect the more general nature of the provision. Additionally, the specific language currently contained in Sections 1014.4, 1021.2 and 1024.5 has been modified with an applicable cross-reference to Section 1005.2 as preferred by the previous code development committee. Lastly, the code is unclear as to how the seven inch door encroachment is measured (i.e. is door hardware included in the measurement). The proposal provides appropriate clarification. The approval of this proposal would result in the continuity of application of means of egress width encroachment requirements.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Modified

Modify the proposal as follows:

1005.2 Door encroachment. Doors, when fully opened, and handrails, shall not reduce the required means of egress width by more than 7 inches (178 mm). ~~Such door measurements shall include the thickness of the door and any hardware between the door and the adjacent wall surface.~~ Doors in any position shall not reduce the required width by more than one-half. Other nonstructural projections such as trim and similar decorative features are permitted to project into the required width 1.5 inches (38 mm) on each side.

Exception: The restrictions on a door swing shall not apply to doors within individual dwelling units and sleeping units of Group R-2 and dwelling units of Group R-3.

(Portions of proposal not shown remain unchanged)

Committee Reason: The proposed language would combine protrusion requirements in one section and would reduce redundancy. The sentence regarding measuring of the door and one-half of the hardware was deleted for consistency with the committee action on E17-06/07. Clear width or corridors should include hardware.

Assembly Action:

None

Final Hearing Results

E18-06/07

AM

Code Change No: **E21-06/07**

Original Proposal

Sections: 1007.1 (IFC [B] 1007.1)

Proponent: Ed Roether, HOK SVE

Revise as follows:

1007.1 Accessible means of egress required. Accessible means of egress shall comply with this section. Accessible spaces shall be provided with not less than one accessible means of egress. Where more than one means of egress is required by Section 1015.1 or 1019.1 from any accessible space, each accessible portion of the space shall be served by not less than two accessible means of egress.

Exceptions:

1. Accessible means of egress are not required in alterations to existing buildings.
2. One accessible means of egress is required from an accessible mezzanine level in accordance with Section 1007.3, 1007.4 or 1007.5.
3. In assembly spaces areas with sloped floors or stepped aisles, one accessible means of egress is required from a space permitted where the common path of travel is accessible and of the accessible route for access to the wheelchair spaces meets the requirements in Section 1025.8.

Reason: The purpose of this proposed change is threefold, first coordination with other sections of the building code, ICC A117.1, and ADAAG by the use of the term "assembly areas", and second for the common path of travel to be the same for sloped or tiered seating arrangements, and then third to clarify the language of this exception.

"Assembly area" is a term that is used for seating elsewhere in the code and is coordinated with ICC A117.1 and ADAAG, therefore it should be the appropriate term used here for consistency. An accessible route to and from wheelchair spaces is required for safe ingress and egress. The same concern for the accessible route is applicable in both ramped or tiered seating arrangements, therefore, the exception should be applicable to both situations.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The proposal would allow theaters to use common path of travel for stepped aisles as well as sloped floors. This is an improvement that was lacking in the code.

Assembly Action:

None

Final Hearing Results

E21-06/07

AS

Code Change No: **E23-06/07**

Original Proposal

Sections: 1007.2, 1007.3, 1007.6, 1007.6.2 (IFC [B] 1007.2, [B] 1007.3, [B] 1007.6, [B] 1007.6.2)

Proponent: Philip Brazil, Reid Middleton, Inc., representing himself

Revise as follows:

1007.2 Continuity and components. Each required accessible means of egress shall be continuous to a public way and shall consist of one or more of the following components:

1. Accessible routes complying with Section 1104.
2. Interior exit stairways ~~within vertical exit enclosures~~ complying with Sections 1007.3 and 1020.
3. Exterior exit stairways complying with Sections 1007.3 and 1023.
4. Elevators complying with Section 1007.4.
5. Platform lifts complying with Section 1007.5.
6. Horizontal exits complying with Section 1022.
7. Ramps complying with Section 1010.
8. Areas of refuge complying with Section 1007.6

Exceptions:

4. Where the exit discharge is not accessible, an exterior area for assisted rescue must be provided in accordance with Section 1007.8.
2. ~~Where the exit stairway is open to the exterior, the accessible means of egress shall include either an area of refuge in accordance with Section 1007.6 or an exterior area for assisted rescue in accordance with Section 1007.8.~~

1007.3 Exit stairways. In order to be considered part of an accessible means of egress, an exit stairway shall have a clear width of 48 inches (1219 mm) minimum between handrails and shall either incorporate an area of refuge within an enlarged floor-level landing or shall be accessed from either an area of refuge complying with Section 1007.6 or a horizontal exit.

Exceptions:

1. ~~Unenclosed exit stairways as permitted by Section 1020.1 are permitted to be considered part of an accessible means of egress.~~
- 1.2. The area of refuge is not required at unenclosed interior exit stairways as permitted by Section 1020.1 in buildings or facilities that are equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1.
- 2.3. The clear width of 48 inches (1219 mm) between handrails is not required at exit stairways in buildings or facilities equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2.
- 3.4. The clear width of 48 inches (1219 mm) between handrails is not required for exit stairways accessed from a horizontal exit.
- 4.5. Areas of refuge are not required at exit stairways serving open parking garages.
5. Where the exit stairway is open to the exterior, the accessible means of egress shall include either an area of refuge in accordance with Section 1007.6 or an exterior area for assisted rescue in accordance with Section 1007.8

1007.6 Areas of refuge. Every required area of refuge shall be accessible from the space it serves by an accessible means of egress. The maximum travel distance from any accessible space to an area of refuge shall not exceed the travel distance permitted for the occupancy in accordance with Section 1016.1. Every required area of refuge shall have direct access to an ~~enclosed~~ a stairway within an exit enclosure complying with Sections 1007.3 and ~~1020.4~~

1020 or an elevator complying with Section 1007.4. Where an elevator lobby is used as an area of refuge, the shaft and lobby shall comply with Section 1020.1.7 for smokeproof enclosures except where the elevators are in an area of refuge formed by a horizontal exit or smoke barrier.

1007.6.2 Separation. Each area of refuge shall be separated from the remainder of the story by a smoke barrier complying with Section 709 or a horizontal exit complying with Section 1021. Each area of refuge shall be designed to minimize the intrusion of smoke.

Exception: Areas of refuge located within a ~~vertical~~ an exit enclosure.

Reason: The purpose of this proposal is to reorganize the requirements for accessible means of egress and eliminate extraneous provisions. Section 1007.1 specifies the minimum number of accessible means of egress. Section 1007.2 requires each one to be continuous to a public way by means of one or more components. Exception #1 is appropriately located but Exception #2 is better located in Section 1007.3.

The items in Section 1007.2 include stairways within vertical exit enclosures and exterior exit stairways. Unenclosed interior exit stairways are excluded, but Exception #1 to Section 1007.3 effectively includes them. The proposal simplifies the provisions by modifying Item #2 of Section 1007.2 to specify interior exit stairways complying with Sections 1007.3 and 1020. This has the effect of including unenclosed exit stairways as permitted by Section 10201. Exception #1 to Section 1007.3 is deleted in coordination with this change. The current Exception #2 (proposed Exception #1) to Section 1007.3 is also modified for consistency with the changes.

Section 1007.6 is changed for consistency with the current language in Item #2 of Section 1007.2, which is appropriate in this case. The reference to Section 1020.1 is changed to Section 1020 for the same reason.

In the exception to Section 1007.6.2, the change from "vertical exit enclosure" to "exit enclosure" is made for consistency with other provisions in the IBC, which consistently use the term "exit enclosure." This consistency was established by code change proposal E1-03/04 (AS).

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Modified

Modify proposal as follows:

1007.2 Continuity and components. Each required accessible means of egress shall be continuous to a public way and shall consist of one or more of the following components:

1. Accessible routes complying with Section 1104.
2. Interior exit stairways within vertical exit enclosures complying with Sections 1007.3 and 1020.
3. Exterior exit stairways complying with Sections 1007.3 and 1023.
4. Elevators complying with Section 1007.4.
5. Platform lifts complying with Section 1007.5.
6. Horizontal exits complying with Section 1022.
7. Ramps complying with Section 1010.
8. Areas of refuge complying with Section 1007.6

Exceptions:

1. Where the exit discharge is not accessible, an exterior area for assisted rescue must be provided in accordance with Section 1007.8.
2. ~~Where the exit stairway is open to the exterior, the accessible means of egress shall include either an area of refuge in accordance with Section 1007.6 or an exterior area for assisted rescue in accordance with Section 1007.8.~~

1007.3 Exit stairways. In order to be considered part of an accessible means of egress, an exit stairway shall have a clear width of 48 inches (1219 mm) minimum between handrails and shall either incorporate an area of refuge within an enlarged floor-level landing or shall be accessed from either an area of refuge complying with Section 1007.6 or a horizontal exit.

Exceptions:

1. The area of refuge is not required at unenclosed interior exit stairways as permitted by Section 1020.1 in buildings or facilities that are equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1.
2. The clear width of 48 inches (1219 mm) between handrails is not required at exit stairways in buildings or facilities equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2.
3. The clear width of 48 inches (1219 mm) between handrails is not required for exit stairways accessed from a horizontal exit.
4. Areas of refuge are not required at exit stairways serving open parking garages.
5. ~~Where the exit stairway is open to the exterior, the accessible means of egress shall include either an area of refuge in accordance with Section 1007.6 or an exterior area for assisted rescue in accordance with Section 1007.8~~

(Portions of proposal not shown remain unchanged)

Committee Reason: The proposal clarifies the continuity for the accessible means of egress. The proponent asked for the modification to not relocate current Section 1007.2, Exception 2 to a new Section 1007.3, Exception 5. The proponent wished to bring this portion forward in a later proposal.

Staff note: The committee action to Sections 1007.2 and 1007.6.2 have removed the final direct reference to Vertical exit enclosures® in Chapter 10. The result is that the title of Section 1020 will be changed from Vertical exit enclosures® to Exit enclosures®. Note that titles are editorial.

Assembly Action:

None

Final Hearing Results

E23-06/07

AM

Code Change No: E25-06/07

Original Proposal

Sections: 1007.3, 1007.4 (IFC [B] 1007.3, [B] 1007.4)

Proponent: Dave Frable, U.S. General Services Administration

Revise as follows:

1007.3 Exit stairways. In order to be considered part of an accessible means of egress, an exit stairway shall have a clear width of 48 inches (1219 mm) minimum between handrails and shall either incorporate an area of refuge within an enlarged floor-level landing or shall be accessed from either an area of refuge complying with Section 1007.6 or a horizontal exit.

Exceptions:

1. Unenclosed exit stairways as permitted by Section 1020.1 are permitted to be considered part of an accessible means of egress.
2. The area of refuge is not required at unenclosed exit stairways as permitted by Section 1020.1 in buildings or facilities that are equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1.
3. The clear width of 48 inches (1219 mm) between handrails is not required at exit stairways in buildings or facilities equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2.
4. Areas of refuge are not required at exit stairways in buildings or facilities equipped throughout by an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2.
4. 5. The clear width of 48 inches (1219 mm) between handrails is not required for exit stairways accessed from a horizontal exit.
- ~~5.~~ 6. Areas of refuge are not required at exit stairways serving open parking garages.

1007.4 Elevators. In order to be considered part of an accessible means of egress, an elevator shall comply with the emergency operation and signaling device requirements of Section 2.27 of ASME A17.1. Standby power shall be provided in accordance with Sections 2702 and 3003. The elevator shall be accessed from either an area of refuge complying with Section 1007.6 or a horizontal exit.

Exceptions:

1. Elevators are not required to be accessed from an area of refuge or horizontal exit in open parking garages.
2. Elevators are not required to be accessed from an area of refuge or horizontal exit in buildings and facilities equipped throughout by an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2.

Reason: The purpose of this Code change is to reinstate into the Code the subject exceptions regarding not requiring areas of refuge (AOR) in buildings or facilities protected throughout by an automatic sprinkler system designed and installed in accordance with Section 903.3.1.1 or 903.3.1.2. The subject exceptions had been in all previous editions of the IBC; including each of the legacy Codes, which recognized any floor of

a building protected throughout by an approved, operational automatic sprinkler system as an AOR. This recognition is based on sound technical research and acknowledges the ability of a properly designed and operational automatic sprinkler system to control a fire at its point of origin and to limit production of toxic products to a level that is not life threatening.

However, at the Final Action Hearings of the ICC in September 2005, the ICC membership voted to delete the subject two exceptions. However, no technical research data was provided to support any of the proponent's substantiation or rationale for deleting the exceptions for installing AOR in buildings protected throughout by an operational automatic fire sprinkler system.

Below, I have provided the technical research data that substantiated the rationale for not installing AOR in buildings that are protected throughout by an operational automatic fire sprinkler system in the previous editions of the IBC.

In 1989, at the request of Congress, the U.S. General Services Administration (GSA) undertook a project to construct AOR for persons with mobility limitations. In 1991, GSA funded the National Institute of Standards and Technology (NIST) to evaluate the concept of AOR as a means of providing fire protection for persons with disabilities in office buildings.

The NIST evaluation consisted of field tests, threat analysis, and a human behavior study of AOR in six office buildings. The threat analysis included hazards inside the AOR as well as hazards traveling to these areas for both sprinklered and unsprinklered office buildings.

In 1992, NIST issued their findings and recommendations in a report titled "*Staging Areas for Persons with Mobility Impairments*" – NISTIR 4770. The NIST report resulted in a number of conclusions regarding fire protection strategies for persons with disabilities that are believed to be applicable to many other buildings. The primary conclusion of the report was that the operation of a properly designed sprinkler system eliminates the life threat to all occupants regardless of their individual abilities and can provide superior protection for persons with disabilities as compared to staging areas.

To the best of our knowledge, no physical tests or scientifically based fire safety analysis of AOR's has occurred since the printing of this 1992 report. In addition, sprinkler technology has also improved since 1992. Quick response sprinklers are now required to be used where in 1992, standard response sprinklers were utilized.

Regarding some of the opinions expressed at the Final Action Hearings of the ICC in September 2005 regarding automatic sprinkler reliability. A recent comprehensive analysis in 2005 of high-rise fires by NFPA identified that no fatalities had occurred for more than a decade in any U.S. high-rise occupancy (> 10 story) other than the 6 fatalities in the unsprinklered Cook County Office Building (2003); the 1 fatality in the unsprinklered First Interstate Bank Building (1991); and 3 firefighter fatalities in the partially sprinklered (unsprinklered on floor of fire origin and several floors above) Meridian Plaza Building (1991). The Murrah Federal Building (1995) and the World Trade Center (1993 & 2001) bombings were excluded from this analysis.

The recently issued NFPA 2005 report on sprinkler reliability also indicated that automatic fire sprinklers successfully operating in reported structural fires was an exemplary 93%. In addition, NFPA also reported that 2/3rds of the reported automatic fire sprinkler system failures were because the automatic fire sprinkler systems were shut off. Since the IBC requires the supervision of the automatic fire sprinkler system, one can conclude that the successful operation of an automatic fire sprinkler system designed and installed in compliance with the IBC requirements could be reasonably estimated at 98%. NFPA also reported that the percentage of successfully operating automatic fire sprinkler systems is probably higher since a large percentage of small fire extinguished by fire sprinklers are not reported. Therefore, for an automatic fire sprinkler system designed and installed in accordance with the IBC requirements, the successful operation of an automatic fire sprinkler system could be reasonably estimated at 98% or more.

Based on all these points stated above, we strongly believe that it unreasonable not to recognize that any floor of a building protected throughout by an approved, operational automatic fire sprinkler system serve as an AOR. We believe the rationale is sound and based on technical research that acknowledges the ability of a properly designed and operational automatic sprinkler system to control a fire at its point of origin and to limit production of toxic products to a level that is not life threatening to all occupants of the building, including persons with disabilities. In addition, we believe the cost to construct AOR's will significantly increase building construction and maintenance costs without increasing the overall safety to the building occupants.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The sprinkler exception for areas of refuge was deleted from Sections 1007.2 and 1007.3 as part of the final action hearings of the 04/05 cycle. No technical justification was provided to support the deletion of this option. There has been no loss of life in sprinklered high rise buildings. In addition, the deletion of the exceptions have resulted in conflicts with the elevator protection provisions and smoke barrier construction. There would be significant ramifications to current building construction.

Assembly Action:

None

Final Hearing Results

E25-06/07

AS

Code Change No: **E27-06/07**

Original Proposal

Sections: 1007.4 (IFC [B] 1007.4)

Proponent: Lawrence G. Perry, AIA, representing BOMA

Revise as follows:

1007.4 Elevators. In order to be considered part of an accessible means of egress, an elevator shall comply with the emergency operation and signaling device requirements of Section 2.27 of ASME A17.1. Standby power shall be provided in accordance with Sections 2702 and 3003. The elevator shall be accessed from either an area of refuge complying with Section 1007.6 or a horizontal exit.

Exceptions:

1. Elevators are not required to be accessed from an area of refuge or horizontal exit in open parking garages.
2. Elevators not required to be located in a shaft in accordance with Section 707.2 are not required to be accessed from an area of refuge or horizontal exit.
3. Elevators are not required to be accessed from an area of refuge or a horizontal exit where all portions of the means of egress are essentially open to the outside.

Reason: The proposed two new exceptions attempt to coordinate the accessible means of egress/area of refuge requirements, which were significantly modified by floor action at the Final Hearings of the '04/'05 Cycle, with the requirements for enclosed elevator lobbies (707.14.1). Proposed exception 2 allows omission of the area of refuge at elevators that are not required to be located within a shaft enclosure. A common example is elevators located within an atrium. The code specifically exempts such elevators from lobby enclosure requirements; it makes no sense to mandate a small enclosed box around the elevator when the elevator is otherwise permitted to be totally open to the atrium.

Proposed exception 3 addresses outdoor locations where elevators may be provided, such as transit station platforms and A-5 assembly occupancies. The purpose of the area of refuge or horizontal exit is to provide separation from the products of combustion during a fire. If the area is open to the outside, smoke will not accumulate.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Modified

Modify proposal as follows:

1007.4 Elevators. In order to be considered part of an accessible means of egress, an elevator shall comply with the emergency operation and signaling device requirements of Section 2.27 of ASME A17.1. Standby power shall be provided in accordance with Sections 2702 and 3003. The elevator shall be accessed from either an area of refuge complying with Section 1007.6 or a horizontal exit.

Exceptions:

1. Elevators are not required to be accessed from an area of refuge or horizontal exit in open parking garages.
2. Elevators not required to be located in a shaft in accordance with Section 707.2 are not required to be accessed from an area of refuge or horizontal exit.
3. ~~Elevators are not required to be accessed from an area of refuge or a horizontal exit where all portions of the means of egress are essentially open to the outside.~~

Committee Reason: The proposed exception 2 is a logical extension. If an elevator is not in a shaft, an area of refuge in front of it would not make sense. The modification to delete Exception 3 was for consistency with the committee action on E26-06/07. The term "essentially" is not readily defined.

Assembly Action:

None

Final Hearing Results

E27-06/07

AM

Code Change No: E28-06/07

Original Proposal

Sections: 1007.3, 1007.4, 1007.7 (IFC [B] 1007.3, [B] 1007.4, [B] 1007.7)

Proponent: Ed Roether, HOK SVE

Revise as follows:

1007.3 Exit stairways. In order to be considered part of an accessible means of egress, an exit stairway shall have a clear width of 48 inches (1219 mm) minimum between handrails and shall either incorporate an area of refuge within an enlarged floor-level landing or shall be accessed from either an area of refuge complying with Section 1007.6 or a horizontal exit.

Exceptions:

1. Unenclosed exit stairways as permitted by Section 1020.1 are permitted to be considered part of an accessible means of egress.
2. The area of refuge is not required at unenclosed exit stairways as permitted by Section 1020.1 in buildings or facilities that are equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1.
3. The clear width of 48 inches (1219 mm) between handrails is not required at exit stairways in buildings or facilities equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2.
4. The clear width of 48 inches (1219 mm) between handrails is not required for exit stairways accessed from a horizontal exit.
5. Areas of refuge are not required at exit stairways serving open parking garages.
6. Areas of refuge are not required for smoke protected seating areas complying with Section 1025.6.2.

1007.4 Elevators. In order to be considered part of an accessible means of egress, an elevator shall comply with the emergency operation and signaling device requirements of Section 2.27 of ASME A17.1. Standby power shall be provided in accordance with Sections 2702 and 3003. The elevator shall be accessed from either an area of refuge complying with Section 1007.6 or a horizontal exit.

Exceptions:

1. Elevators are not required to be accessed from an area of refuge or horizontal exit in open parking garages.
2. Elevators are not required to be accessed from an area of refuge or horizontal exit for smoke protected seating areas complying with Section 1025.6.2.

1007.7 Signage. At exits and elevators serving a required accessible space but not providing an approved accessible means of egress, signage shall be installed indicating the location of accessible means of egress. At refuge areas created by horizontal exits or where areas of refuge are not required, provide signage indicating areas to wait for rescue assistance.

Reason: The purpose of this proposed change is to rectify a potentially unintended result of a recent code change. The purpose of a smoke barrier is to minimize the intrusion of smoke. In environments where the entire area has protection against the accumulation of smoke, requiring an additional smoke barrier is not only redundant but potentially hazardous. For example, enclosing a room in an exterior stadium concourse does not enhance safety, if anything it would diminish it.

Smoke-protected seating is performance based design providing an environment where smoke is maintained away from occupants from the seat to exit discharge with design criterion established in Section 909. Therefore, smoke-protected seating already provides an environment meeting the intent of the protection offered by areas of refuge. For seating to be considered smoke-protected it is required to maintain the level of smoke at least 6 feet above the floor of the means of egress (please refer to Section 1025.6.2.1). In addition, a life safety evaluation, complying with NFPA 101, is required for smoke-protected assembly seating (please refer to Section 1025.6.2).

Even when areas of refuge are not provided, signage indicating where people can wait for assisted rescue should be provided. This would happen at horizontal exits, an open exit stairway or in smoke free environments such as open parking garages or smoke protected seating areas.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Modified

Modify the proposal as follows:

1007.7 Signage. At exits and elevators serving a required accessible space but not providing an approved accessible means of egress, signage shall be installed indicating the location of accessible means of egress. ~~At refuge areas created by horizontal exits or where areas of refuge are not required, provide signage indicating areas to wait for rescue assistance.~~

(Portions of proposal not shown remain unchanged)

Committee Reason: The modification provided definable criteria for areas where smoke protected seating for all occupants is provided. It is logical that this is a viable alternative for areas of refuge for persons with mobility impairments. The modification removed the proposed revision to Section 1007.7. If an area of refuge is not required, then signage for that area of refuge does not make sense.

Assembly Action:

None

Final Hearing Results

E28-06/07

AM

Code Change No: E29-06/07

Original Proposal

Sections: 1007.3 (IFC [B] 1007.3)

Proponent: Ron Nickson, National Multi Housing Council/National Apartment Association

Revise as follows:

1007.3 Exit stairways. In order to be considered part of an accessible means of egress, an exit stairway shall have a clear width of 48 inches (1219 mm) minimum between handrails and shall either incorporate an area of refuge within an enlarged floor-level landing or shall be accessed from either an area of refuge complying with Section 1007.6 or a horizontal exit.

Exceptions:

1. Unenclosed exit stairways as permitted by Section 1020.1 are permitted to be considered part of an accessible means of egress.
2. The area of refuge is not required at unenclosed exit stairways as permitted by Section 1020.1 in buildings or facilities that are equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1.
3. The clear width of 48 inches (1219 mm) between handrails is not required at exit stairways in buildings or facilities equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2.
4. The clear width of 48 inches (1219 mm) between handrails is not required for exit stairways accessed from a horizontal exit.
5. Areas of refuge are not required at exit stairways serving open parking garages.
6. The areas of refuge are not required in Group R-2 occupancies.

Reason: To allow an exception to not require an area of refuge in apartment buildings and individual dwellings because the individual sprinklered apartment provide a much superior area to protect the apartment occupant than would be provided by the area of refuge. In addition to each individual unit being surrounded by partitions and horizontal assemblies in accordance with Section 419, the unit also has the special items necessary for the individual occupant.

NFPA fire data from *U.S. Experience with Sprinklers* by Kimberly Rohr and John R. Hall, Jr., December 2005 (copy attached) supports the safety of the individual apartment. According to the report 95% (Table 12, page 46) of the fires in sprinklered apartment buildings are confined within the room of origin (object of origin – 69%, area of origin – 20%, and room of origin – 6%). More important the report goes on to address the

effectiveness of sprinklers in saving lives by stating "NFPA has no record of a fire killing more than two people in a completely sprinklered public assembly, educational, institutional, or residential building where the system was properly operating" (Page 32). NFPA also reports that residential sprinkler system reliability of 98% (2% failure, Table 4, page 17) is the highest for all occupancies. The Operation Life Safety reported on the safety of residential systems also shows that the systems save lives. An evaluation of the report *Residential Sprinkler Activations* (copy attached) shows no deaths in buildings protected with the NFPA 13D and 13R sprinkler systems?

Cost Impact: The code change proposal will decrease the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: Since Group R-2 occupancies are required to be sprinklered and separated, there is sufficient protection for the residents. There was a question if with the committee action on E25-06/07 that this exception may be redundant.

Assembly Action:

None

Final Hearing Results

E29-06/07

AS

Code Change No: E30-06/07

Original Proposal

Sections: 1007.3 (IFC [B] 1007.3)

Proponent: Ron Nickson, National Multi Housing Council/National Apartment Association

Revise as follows:

1007.3 Exit stairways. In order to be considered part of an accessible means of egress, an exit stairway shall have a clear width of 48 inches (1219 mm) minimum between handrails and shall either incorporate an area of refuge within an enlarged floor-level landing or shall be accessed from either an area of refuge complying with Section 1007.6 or a horizontal exit.

Exceptions:

1. Unenclosed exit stairways as permitted by Section 1020.1 are permitted to be considered part of an accessible means of egress.
2. The area of refuge is not required at unenclosed exit stairways as permitted by Section 1020.1 in buildings or facilities that are equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.1.1.2.
3. The clear width of 48 inches (1219 mm) between handrails is not required at exit stairways in buildings or facilities equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2.
4. The clear width of 48 inches (1219 mm) between handrails is not required for exit stairways accessed from a horizontal exit.
5. Areas of refuge are not required at exit stairways serving open parking garages.

Reason: To allow the exceptions for not requiring an area of refuge at unenclosed exit stairways permitted for buildings with NFPA 13 sprinkler systems to also be allowed with NFPA 13R sprinkler systems. The design requirements and thus the protection provided with NFPA 13R system in the area being protected are the same as that provided with a NFPA 13 system.

Cost Impact: The code change proposal will decrease the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: In this particular case, the use of sprinkler systems provided in accordance with NFPA 13R is reasonable and will provide the needed level of protection.

Assembly Action:

None

Final Hearing Results

E30-06/07

AS

Code Change No: **E35-06/07**

Original Proposal

Sections: 1007.6 (IFC [B] 1007.6)

Proponent: Ed Roether, HOK SVE

Revise as follows:

1007.6 Areas of refuge. Every required area of refuge shall be accessible from the space it serves by an accessible means of egress. The maximum travel distance from any accessible space to an area of refuge shall not exceed the travel distance permitted for the occupancy in accordance with Section 1016.1. Every required area of refuge shall have direct access to an enclosed exit stairway complying with Sections 1007.3 and 1020.1 or an elevator complying with Section 1007.4. Where an elevator lobby is used as an area of refuge, the shaft and lobby shall comply with Section 1020.1.7 for smokeproof enclosures except where the elevators are in an area of refuge formed by a horizontal exit or smoke barrier.

Exceptions:

1. A stairway serving an area of refuge is not required to be enclosed where permitted in Section 1020.1.
2. Smokeproof enclosure is not required for an elevator lobby used as an area of refuge not required to be enclosed.

Reason: The purpose of this proposed change is to clarify two things: first that an exit stair that is not required to be enclosed by Section 1020.1 is not otherwise required to be enclosed in order to serve an area of refuge, and then second that elevator shaft and lobby is not required to be smokeproof where the area of refuge would not need to be separated from the remaining space. Without this proposed change, it may be interpreted that the limited conditions where an exit stair is not required to be enclosed would need to be enclosed when it serves an area of refuge. In addition, it may be interpreted providing smokeproof enclosure for elevator lobbies and shafts would be required even when the area of refuge is not required to be separated.

An exterior stair in A5 occupancy is not required to be enclosed per Section 1020.1. However, without this proposed change that same exterior stair might be required to be enclosed when it serves an area of refuge. As stated in another proposed change, separating an area of refuge from an open air exterior concourse is counter-productive when the concourse is already protected from smoke. Enclosing an exterior exit stair does not seem to offer any greater protection from smoke, but potentially reduces its protection. Similarly, enclosing an exterior elevator shaft and lobby might offer more potential for smoke collection compared to an open air exterior space.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The level of protection offered by an open exit access stair is negligible, and what is needed is an actual exit enclosure.

Assembly Action:

None

Final Hearing Results

E35-06/07

AS

Code Change No: **E40-06/07**

Original Proposal

Sections: 1008.1.1.1 (IFC [B] 1008.1.1.1)

Proponent: Bill Conner, Bill Conner Associates LLC, representing himself

Revise as follows:

1008.1.1.1 Projections into clear width. There shall not be projections into the required clear width lower than 34 inches (864 mm) above the floor or ground. Projections into the clear opening width between 34 inches (864 mm) and 80 inches (2032 mm) above the floor or ground shall not exceed 4 inches (102 mm).

Exception: Door closers and door stops shall be permitted to be 78 inches (1980 mm) minimum above the floor.

Reason: The purpose of this proposal is to allow for door closers and stops to protrude into the 80" minimum height. This is coordinated with ICC A117.1, Section 404.2.2.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The lower headroom height for door closers and stops will allow design flexibility without adversely affecting the means of egress.

Assembly Action:

None

Final Hearing Results

E40-06/07

AS

Code Change No: **E41-06/07**

Original Proposal

Sections: 1008.1.2 (IFC [B] 1008.1.2)

Proponent: John Neff, Washington State Building Code Council

Revise as follows:

1008.1.2 Door swing. Egress doors shall be side-hinged swinging.

Exceptions:

1. Private garages, office areas, factory and storage areas with an occupant load of 10 or less.
2. Group I-3 occupancies used as a place of detention.
3. Critical or intensive care patient rooms within suites of health care facilities.
4. Doors within or serving a single dwelling unit in Groups R-2 and R-3.
5. In other than Group H occupancies, revolving doors complying with Section 1008.1.3.1.
6. In other than Group H occupancies, horizontal sliding doors complying with Section 1008.1.3.3 are permitted in a means of egress.
7. Power-operated doors in accordance with Section 1008.1.3.2.
8. Doors serving a bathroom within an individual sleeping unit in Group R-1.
9. In other than Group H Occupancies, manually operated horizontal sliding doors are permitted in a means of egress from spaces with an occupant load of 10 or less.

Doors shall swing in the direction of egress travel where serving an occupant load of 50 or more persons or a Group H occupancy.

The opening force for interior side-swinging doors without closers shall not exceed a 5-pound (22 N) force. For other side-swinging, sliding and folding doors, the door latch shall release when subjected to a 15-pound (67 N) force. The door shall be set in motion when subjected to a 30-pound (133 N) force. The door shall swing to a full-open position when subjected to a 15 pound (67 N) force. Forces shall be applied to the latch side.

Reason: The purpose of the code change is to add an exception to the code to allow a specific type of door for egress from areas of low occupancy. This exception is needed to allow space efficient design while maintaining a proven level of safety. Use of manual horizontal sliding doors for egress from low occupancy spaces was allowed under legacy codes with no impact on the health and safety of the occupants. Examples of where these doors have been used for egress include hotel balconies and in teacher break rooms in school facilities.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Modified

Modify proposal as follows:

1008.1.2 Door swing. Egress doors shall be side-hinged swinging.

Exceptions:

- ~~1. Private garages, office areas, factory and storage areas with an occupant load of 10 or less.~~
- 9 1. In other than Group H Occupancies, manually operated horizontal sliding doors are permitted in a means of egress from spaces with an occupant load of 10 or less.
2. Group I-3 occupancies used as a place of detention.
3. Critical or intensive care patient rooms within suites of health care facilities.
4. Doors within or serving a single dwelling unit in Groups R-2 and R-3.
5. In other than Group H occupancies, revolving doors complying with Section 1008.1.3.1.
6. In other than Group H occupancies, horizontal sliding doors complying with Section 1008.1.3.3 are permitted in a means of egress.
7. Power-operated doors in accordance with Section 1008.1.3.2.
8. Doors serving a bathroom within an individual sleeping unit in Group R-1.

Doors shall swing in the direction of egress travel where serving an occupant load of 50 or more persons or a Group H occupancy.

The opening force for interior side-swinging doors without closers shall not exceed a 5-pound (22 N) force. For other side-swinging, sliding and folding doors, the door latch shall release when subjected to a 15-pound (67 N) force. The door shall be set in motion when subjected to a 30-pound (133 N) force. The door shall swing to a full-open position when subjected to a 15 pound (67 N) force. Forces shall be applied to the latch side.

Committee Reason: The change allowing for a horizontal sliding door instead of a side swinging door in areas with small occupant loads would not decrease safety for the means of egress. The modification to delete Exception 1 was to eliminate redundant text with the new exception. The Assembly Action was due to the deletion of Exception 1 resulting in overhead doors not being permitted as an option for some of these small areas.

Assembly Action:

Approved as Submitted

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because an assembly action was successful.

Final Hearing Results

E41-06/07

AS

Code Change No: **E43-06/07**

Original Proposal

Sections: 1008.1.2, 1008.1.3 (New), 1008.1.3.1 (New) [IFC 1008.1.2, [B] 1008.1.3 (New), [B] 1008.1.3.1 (New)]

Proponent: Philip Brazil, Reid Middleton, Inc., representing himself

Revise as follows:

1008.1.2 (IFC 1008.1.2) Door swing. Egress doors shall be side-hinged swinging.

Exceptions:

1. Private garages, office areas, factory and storage areas with an occupant load of 10 or less.
2. Group I-3 occupancies used as a place of detention.
3. Critical or intensive care patient rooms within suites of health care facilities.
4. Doors within or serving a single dwelling unit in Groups R-2 and R-3 as applicable in Section 101.2.
5. In other than Group H occupancies, revolving doors complying with Section 1008.1.3.1.
6. In other than Group H occupancies, horizontal sliding doors complying with Section 1008.1.3.3 are permitted in a means of egress.
7. Power-operated doors in accordance with Section 1008.1.3.2.
8. Doors serving a bathroom within an individual sleeping unit in Group R-1.

Doors shall swing in the direction of egress travel where serving an occupant load of 50 or more persons or a Group H occupancy.

1008.1.3 Door opening force. The opening force for pushing or pulling open interior side-swinging egress doors without closers other than fire doors, shall not exceed a 5-pound 5 pounds (22 N) force. For other side-swinging doors, and sliding and folding doors, the door latch shall release when subjected to a 15-pound (67 N) force. The door shall be set in motion when subjected to a 30-pound (133 N) force. The door shall swing to a full-open position when subjected to a 15-pound (67 N) force.

1008.1.3.1 Location of applied forces. Forces shall be applied to the latch side of the door.

Reason: The purpose of this proposal is to make the provisions for door opening forces more technically sound and more consistent with similar provisions in ICC A117.1. IBC Section 1008.1.2 requires egress doors to be side-hinged swinging except for several cases noted in Exceptions #1 through #8. In paragraph #3, the opening force is limited to 5 pounds for interior side-swinging doors without closers. The charging language in paragraph #1, however, is limited to side-hinged swinging doors, which does not include side-swinging doors other than side-hinged swinging (i.e., pivoted). Paragraph #3 specifies limits on opening forces for sliding and folding doors, which is also beyond the scope of the same charging language. Because of this, a new code section is proposed so that the requirements for door opening force are not limited to the charging language in Section 1008.1.2.

Scoping issues aside, the current provisions in paragraph #3 are limited to side-swinging doors, sliding doors and folding doors. Excluded are swinging doors other than side-swinging (i.e., pivoted), which is not the intent. It is also not consistent Section 404.2.8 of ICC A117.1-03 on door-opening force, which applies to all interior hinged doors other than fire doors, not just side-swinging (hinged) doors. The change from "side-swinging" to "swinging" doors will make the necessary correction.

The current language in paragraph #3 of Section 1008.1.2 specifies "opening force." This is changed to "force for pushing and pulling open," also for consistency with Section 404.2.8 of ICC A117.1-03. The substitution of "fire doors" for "without closers" is being done for the same reason. The change from "5-pound force" to "5 pounds" is being done to eliminate redundancy. Note that "force" is specified at the beginning of the sentence.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The reorganization clarifies the operational force is applicable to all inside non-fire doors, including types other than side swinging doors.

Assembly Action:

None

Final Hearing Results

E43-06/07

AS

Code Change No: **E44-06/07**

Original Proposal

Sections: 1008.1.3.1 (IFC [B] 1008.1.3.1)

Proponent: Bill Conner, Conner Associates LLC, representing himself

Revise as follows:

1008.1.3.1 Revolving doors. Revolving doors shall comply with the following:

1. Each revolving door shall be capable of collapsing into a bookfold position with parallel egress paths providing an aggregate width of 36 inches (914 mm).
2. A revolving door shall not be located within 10 feet (3048 mm) of the foot of or top of stairs or escalators. A dispersal area shall be provided between the stairs or escalators and the revolving doors.
3. The revolutions per minute (rpm) for a revolving door shall not exceed those shown in Table 1008.1.3.1.
4. Each revolving door shall have a side-hinged swinging door which complies with Section 1008.1 in the same wall and within 10 feet (3048 mm) of the revolving door.
5. Revolving doors shall not be part of an accessible route required by Section 1007 and Chapter 11.

Reason: Revolving doors cannot be used on an accessible route.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: Revolving doors are a safety hazard along accessible routes without specifications for just how to make them accessible.

Assembly Action:

None

Final Hearing Results

E44-06/07

AS

Code Change No: **E47-06/07**

Original Proposal

Sections: 1008.1.8.3 (IFC [B] 1008.1.8.3)

Proponent: Ralph Vasami, The Kellen Company, representing The Door Safety Council

Revise as follows:

1008.1.8.3 Locks and latches. Locks and latches shall be permitted to prevent operation of doors where any of the following exists:

1. Places of detention or restraint. 2. In buildings in occupancy Group A having an occupant load of 300 or less, Groups B, F, M and S, and in places of religious worship, the main exterior door or doors are permitted to be equipped with key-operated locking devices from the egress side provided:
2. In buildings in occupancy Group A having an occupant load of 300 or less, Groups B, F, M and S, and in places of religious worship, the main exterior door or doors are permitted to be equipped with key-operated locking devices from the egress side provided:
 - 2.1. The locking device is readily distinguishable as locked,
 - 2.2. A readily visible durable sign is posted on the egress side on or adjacent to the door stating: THIS DOOR TO REMAIN UNLOCKED WHEN BUILDING IS OCCUPIED. The sign shall be in letters 1 inch (25 mm) high on a contrasting background, 2.3. The use of the key-operated locking device is revokable by the building official for due cause.
3. Where egress doors are used in pairs, approved automatic flush bolts shall be permitted to be used, provided that the door leaf having the automatic flush bolts has no doorknob or surface-mounted hardware.
4. Doors from individual dwelling or sleeping units of Group R occupancies having an occupant load of 10 or less are permitted to be equipped with a night latch, dead bolt or security chain, provided such devices are openable from the inside without the use of a key or tool.
5. Fire rated doors after the minimum elevated temperature has disabled the unlatching mechanism in accordance with listed fire door test procedures

Reason: This proposal will revise Section 1008 to clarify conditions under which latching devices shall be permitted to prevent door operation. The current code contains a contradiction in that the listed procedures for a fire door include the disabling of the mechanism. Without this added text, the code does not allow the listed feature.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Modified

Modify the proposal as follows:

1008.1.8.3 Locks and latches. Locks and latches shall be permitted to prevent operation of doors where any of the following exists:

1. Places of detention or restraint. 2. In buildings in occupancy Group A having an occupant load of 300 or less, Groups B, F, M and S, and in places of religious worship, the main exterior door or doors are permitted to be equipped with key-operated locking devices from the egress side provided:
2. In buildings in occupancy Group A having an occupant load of 300 or less, Groups B, F, M and S, and in places of religious worship, the main exterior door or doors are permitted to be equipped with key-operated locking devices from the egress side provided:
 - 2.1. The locking device is readily distinguishable as locked,
 - 2.2. A readily visible durable sign is posted on the egress side on or adjacent to the door stating: THIS DOOR TO REMAIN UNLOCKED WHEN BUILDING IS OCCUPIED. The sign shall be in letters 1 inch (25 mm) high on a contrasting background, 2.3. The use of the key-operated locking device is revokable by the building official for due cause.
3. Where egress doors are used in pairs, approved automatic flush bolts shall be permitted to be used, provided that the door leaf having the automatic flush bolts has no doorknob or surface-mounted hardware.
4. Doors from individual dwelling or sleeping units of Group R occupancies having an occupant load of 10 or less are permitted to be equipped with a night latch, dead bolt or security chain, provided such devices are openable from the inside without the use of a key or tool.
5. Fire rated doors after the minimum elevated temperature has disabled the unlatching mechanism in accordance with listed fire door test procedures.

Committee Reason: The proposed language would codify application for doors currently used. A concern was expressed if the listing information would be sufficient to regulate this type of mechanism. The modification to the new item five is for consistency with the terminology for fire doors.

Assembly Action:

None

Final Hearing Results

E47-06/07

AM

Code Change No: E52-06/07

Original Proposal

Sections: 1008.1.8.7 (New) [IFC [B] 1008.1.8.7 (New)]

Proponent: Dave Frable, U.S. General Services Administration

Revise as follows:

1008.1.8.7 Electromagnetically Locked Egress Doors. Doors in the means of egress in buildings with an occupancy in Group A, B, E, M, R-1 or R-2 and doors to tenant spaces in Group A, B, E, M, R-1 or R-2 shall be permitted to be electromagnetically locked if equipped with listed hardware that incorporates a built-in switch that meets the requirements below:

1. The listed hardware is affixed to the door leaf has an obvious method of operation that is readily operated under all lighting conditions.
2. The listed hardware is capable of being operated with one hand.
3. Operation of the listed hardware interrupts power supply to the electromagnetic lock and unlocks the door.
4. Loss of power to the listed hardware automatically unlocks the door.

Reason: The intent of this code change proposal is add a new requirement that would permit doors in the means of egress to be electromagnetically locked if equipped with listed hardware that incorporates a built-in switch that interrupts the power supply to the electromagnetic lock and unlocks the door.

Current code requirements do not permit the use of this new type of technology for electromagnetically locked egress door. Current requirements only permit the use of delayed egress locking systems and egress access control systems. However, these two types of egress locking systems typically do not meet the security needs of the building and are often misapplied.

The listed hardware that incorporates a built-in switch has been tested by UL under Special Locking Arrangements FWAX.SA6635. For example, the Adams Rite 3000 bars are OEM listed as 3700, 3600, 3300, and 3100. In addition, the Securitron Touch Sense Bars and Handles are also listed.

We believe type of locking arrangement will address a majority of security concerns in buildings while still maintaining a reasonable degree of safety. This new type of locking arrangement would also be acceptable in the 2006 edition of the NFPA 101, *Life Safety Code*.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Modified

Modify the proposal as follows:

1008.1.8.7 Electromagnetically locked egress doors. Doors in the means of egress that are not otherwise required to have panic hardware in buildings with an occupancy in Group A, B, E, M, R-1 or R-2 and doors to tenant spaces in Group A, B, E, M, R-1 or R-2 shall be permitted to be electromagnetically locked if equipped with listed hardware that incorporates a built-in switch, and meet that meets the requirements below:

1. The listed hardware affixed to the door leaf has an obvious method of operation that is readily operated under all lighting conditions.
2. The listed hardware is capable of being operated with one hand.
3. Operation of the listed hardware releases interrupts power supply to the electromagnetic lock and unlocks the door immediately.
4. Loss of power to the listed hardware automatically unlocks the door.

Committee Reason: The proposal resolves a huge misunderstanding in the code that all door locks are required to be mechanical. The modification to the base paragraph is to clarify that these locks will not conflict with panic hardware requirements. The modification to Item 2 clarifies that this type of lock is not a delayed egress lock or access control lock addressed elsewhere in the locking requirements.

Assembly Action:

None

Final Hearing Results

E52-06/07

AM

Code Change No: E63-06/07

Original Proposal

Sections: 1009.3.3 (IFC [B] 1009.3.3)

Proponent: William McErlane, City of Springdale, Ohio, representing Ohio Building Officials Association

Revise as follows:

1009.3.3 Profile. The radius of curvature at the leading edge of the tread shall be not greater than 0.5 inch (12.7 mm). Beveling of nosings shall not exceed 0.5 inch (12.7 mm). Risers shall be solid and vertical or sloped from the underside of the leading edge of the tread above at an angle not more than 30 degrees (0.52 rad) from the vertical. The leading edge (nosings) of treads shall project not more than 1.25 inches (32 mm) beyond the tread below and all projections of the leading edges shall be of uniform size, including the leading edge of the floor at the top of a flight.

Exceptions:

1. Solid risers are not required for stairways that are not required to comply with Section 1007.3, provided that the opening between treads does not permit the passage of a sphere with a diameter of 4 inches (102 mm).
2. Solid risers are not required for occupancies in Group I-3 or in F, H and S occupancies other than areas accessible to the public.

Reason: Solid risers are required in occupancies where guards are limited to maximum four inch openings because open risers are typically more than four inches high. They are also a concern for mobility impaired persons. This section already recognizes one occupancy where the opening limitations are relaxed due to decreased hazard. This would allow stairs such as those at loading docks and industrial mezzanines to have open risers.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: Areas that are not open to the public in F, H and S occupancies should not be required to have solid risers on stairway.

Assembly Action:

None

Final Hearing Results

E63-06/07

AS

Code Change No: **E64-06/07**

Original Proposal

Sections: 1009.4 (IFC [B] 1009.4)

Proponent: Bill Conner, Conner Associates LLC, representing himself

Revise as follows:

1009.4 Stairway landings. There shall be a floor or landing at the top and bottom of each stairway. The width of landings shall not be less than the width of stairways they serve. Every landing shall have a minimum dimension measured in the direction of travel equal to the width of the stairway. Such dimension need not exceed 48 inches (1219 mm) where the stairway has a straight run. Doors opening onto a landing shall not reduce the landing to less than one-half the required width. When fully open, the door shall not project more than 7 inches (178 mm) into a landing. When wheelchair spaces are required on the stairway landing in accordance with Section 1007.6.1, the wheelchair space shall not be located in the required width of the landing and doors shall not swing over the wheelchair spaces.

Exceptions: 1- Aisle stairs complying with Section 1025.

2- ~~Doors opening onto a landing shall not reduce the landing to less than one-half the required width. When fully open, the door shall not project more than 7 inches (178 mm) into a landing.~~

Reason: The intent of this proposal is to maintain clear width for the general means of egress down an exit stairway. If a wheelchair space that is part of an area of refuge is located on the landing it is important for the safety of both the general public and the persons using the wheelchair spaces that this area is outside of the general path of travel. The door should not swing over the wheelchair space so that someone can be in the space and not block the door. Wheelchair spaces should be outside of the general traffic flow so that they do not cause a bottle neck and the persons using the wheelchair spaces are not bumped. The other moved language was for consistency with corridors as paths for means of egress (e.g. don't allow the door swing to block the path of travel). This is a requirement, not an exception.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The proponent has provided clarifying language for adequate stairway landings when dealing with both doors opening onto landing and when wheelchair spaces are located on the landing.

Assembly Action:

None

Final Hearing Results

E64-06/07

AS

Code Change No: **E65-06/07**

Original Proposal

Sections: 1009.5.1 (IFC [B] 1009.5.1)

Proponent: Bill Conner, Conner Associates LLC, representing himself

Revise as follows:

1009.5.1 Stairway walking surface. The walking surface of treads and landings of a stairway shall not be sloped steeper than one unit vertical in 48 units horizontal (2-percent slope) in any direction. Stairway treads and landings shall have a solid surface. Finish floor surfaces shall be securely attached.

Exceptions:

1. Openings in stair walking surfaces shall be a size that does not permit the passage of ½ inch (13 mm) diameter sphere. Elongated opening shall be places so that the long dimension is perpendicular to the dominant direction of travel.
2. In Group F, H and S occupancies, other than areas of parking structures accessible to the public, openings in treads and landings shall not be prohibited provided a sphere with a diameter of 1.125 inches (29 mm) cannot pass through the opening.

Reason: The purpose of this proposal is to address what holes in treads should be permitted. This change is intended to coordinate with stairway treads as scoped in ADAAG.

For stairway walking surfaces ICC A117.1 Section 302.3 says ½" openings are permitted on walking surfaces.

There are many locations, especially outside, where allowing perforated treads would help keep snow and water off the tread surfaces.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Modified

Modify the proposal as follows:

1009.5.1 Stairway walking surface. The walking surface of treads and landings of a stairway shall not be sloped steeper than one unit vertical in 48 units horizontal (2-percent slope) in any direction. Stairway treads and landings shall have a solid surface. Finish floor surfaces shall be securely attached.

Exceptions:

1. Openings in stair walking surfaces shall be a size that does not permit the passage of 2 inch (13 mm) diameter sphere. Elongated opening shall be placed so that the long dimension is perpendicular to the ~~dominant~~ direction of travel.
2. In Group F, H and S occupancies, other than areas of parking structures accessible to the public, openings in treads and landings shall not be prohibited provided a sphere with a diameter of 1.125 inches (29 mm) cannot pass through the opening.

Committee Reason: The allowances for grill or grate type stairways, especially in outdoor areas in climates subject to snow accumulation, is necessary for a safe means of egress. A modification was made to delete the word >dominant<-in Exception 1 because the word was redundant.

Assembly Action:

None

Final Hearing Results

E65-06/07

AM

Code Change No: E67-06/07

Original Proposal

Sections: 1009.8 (IFC [B] 1009.8); IRC R311.5.8.1

Proponent: David W. Cooper, Stairway Manufacturers' Association

THIS PROPOSAL IS ON THE AGENDA OF THE IBC MEANS OF EGRESS AND THE IRC BUILDING/ENERGY CODE DEVELOPMENT COMMITTEES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IBC

Revise as follows:

1009.8 Spiral stairways. Spiral stairways are permitted to be used as a component in the means of egress only within dwelling units or from a space not more than 250 square feet (23 m²) in area and serving not more than five occupants, or from galleries, catwalks and gridirons in accordance with Section 1015.6.

A spiral stairway shall have a 7.5 inch (191 mm) minimum clear tread depth at a point 12 inches (305 mm) from the narrow edge. The risers shall be sufficient to provide a headroom of 78 inches (1981 mm) minimum, but riser height shall not be more than 9.5 inches (241 mm). The minimum stairway clear width at and below the handrail shall be 26 inches (660 mm).

PART II – IRC

Revise as follows:

R311.5.8.1 Spiral stairways. Spiral stairways are permitted, provided the minimum clear width at and below the handrail shall be 26 inches (660 mm) with each tread having a 7 1/2-inches (190 mm) minimum tread depth at 12 inches from the narrower edge. All treads shall be identical, and the rise shall be no more than 9 1/2 inches (241 mm). A minimum headroom of 6 feet 6 inches (1982 mm) shall be provided.

Reason: The purpose of the change is to clarify the code. This proposal will allow consistent interpretation.

(IBC) The intent of the code needs to be clarified. The added text clarifies the width that has long been accepted and enforced. This issue is further complicated by the fact that the IBC Commentary drawing does not show the handrail. Another option would be to insert the text "measured at the tread" as the commentary drawing would imply however this is not felt to be the historical interpretation.

(IRC) In R311.5.1 Width, the section discusses the width of the stair at several points. Although this level of detail is not necessary in the Spiral stairway section the added text clarifies the width that has long been accepted and enforced. Because the exception in R311.5.1 refers to this section it is necessary to insert the additional text. The is further complicated by the fact that the IRC Commentary drawing does not show the handrail. Another option would be to insert the text "measured at the tread" as the commentary would imply however this is not felt to be the historical interpretation.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

PART I C IBC

Committee Action:

Approved as Submitted

Committee Reason: The proposed language clarifies where to measure the width of a spiral stairway.

Assembly Action:

None

PART II C IRC

Committee Action:

Approved as Submitted

Committee Reason: The new language for spiral stairways helps to add clarity to this code section and it helps to keep the area at and below the guardrail clear.

Assembly Action:

None

Final Hearing Results

E67-06/07, Part I	AS
E67-06/07, Part II	AS

Code Change No: E69-06/07

Original Proposal

Sections: 1009.10, 1010.8, 1025.13 (IFC [B] 1009.10, [B] 1010.8, [B] 1025.13)

Proponent: Ed Roether, HOK SVE

Revise as follows:

1009.10 Handrails. Stairways shall have handrails on each side and shall comply with Section 1012. Where glass is used to provide the handrail, the handrail shall also comply with Section 2407.

Exceptions:

1. ~~Aisle stairs complying with Section 1025 provided with a center handrail need not have additional handrails.~~ Handrails for aisle stairs are not required where permitted by Section 1025.13.
2. Stairways within dwelling units, spiral stairways and aisle stairs serving seating only on one side are permitted to have a handrail on one side only.
3. Decks, patios and walkways that have a single change in elevation where the landing depth on each side of the change of elevation is greater than what is required for a landing do not require handrails.
4. In Group R-3 occupancies, a change in elevation consisting of a single riser at an entrance or egress door does not require handrails.
5. Changes in room elevations of only one riser within dwelling units and sleeping units in Group R-2 and R-3 occupancies do not require handrails.

1010.8 Handrails. Ramps with a rise greater than 6 inches (152 mm) shall have handrails on both sides. Handrails shall comply with Section 1012.

Exception: Handrails for ramped aisles are not required where permitted by Section 1025.13.

1025.13 Handrails. Ramped aisles having a slope exceeding one unit vertical in 15 units horizontal (6.7-percent slope) and aisle stairs shall be provided with handrails located either at the side or within the aisle width.

Exceptions:

1. Handrails are not required for ramped aisles having a gradient no greater than one unit vertical in eight units horizontal (12.5-percent slope) and seating on both sides.
2. Handrails are not required if, at the side of the aisle, there is a guard that complies with the graspability requirements of handrails.
3. Handrail extensions are not required at the top and bottom of aisle stair and aisle ramp runs to permit crossovers within the aisles.

Reason: The intent is clarification of the handrail provisions for aisle steps and aisle ramps in assembly seating and coordination with ICC A117.1 and ADAAG Section 505.

Section 1009.10, Exception 1: The handrail exception for aisle steps should provided direct reference to handrail provisions.

Section 1010.8: Coordination with handrails provisions for ramps is required.

Section 1025.13: New language – coordination with A117.1 and ADA 505.2 and 505.10. The handrail extensions could become protruding objects at these locations.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: This proposal clarifies handrail requirements in aisles serving seating areas. Perhaps a public comment could be brought forward to clean up Anot required where permitted® and put the exceptions in better code language.

Assembly Action:

None

Final Hearing Results

E69-06/07

AS

Code Change No: E70-06/07

Original Proposal

Sections: 1009.10 (IFC [B] 1009.10)

Proponent: Tom Rubotton, City of Lakewood, Colorado, representing the Colorado Chapter of ICC

Revise as follows:

1009.10 Handrails. Stairways shall have handrails on each side and shall comply with Section 1012. Where glass is used to provide the handrail, the handrail shall also comply with Section 2407.

Exceptions:

1. Aisle stairs complying with Section 1025 provided with a center handrail need not have additional handrails.
2. Stairways within dwelling units, spiral stairways and aisle stairs serving seating only on one side are permitted to have a handrail on one side only.
3. Decks, patios and walkways that have a single change in elevation where the landing depth on each side of the change of elevation is greater than what is required for a landing do not require handrails.
4. In Group R-3 occupancies, a change in elevation consisting of a single riser at an entrance or egress door does not require handrails.
5. Changes in room elevations of ~~only one riser~~ 3 or fewer risers within dwelling units and sleeping units in Group R-2 and R-3 do not require handrails.

Reason: This code change will make these requirements for when handrails are required on stairs within dwelling units and sleeping units in R-2 and R-3 occupancies the same as the requirements when building under the IRC. These occupancies are considered non transient and therefore the occupants are living there for longer periods of time and are much more familiar with their surroundings. It does not make sense to require handrails when there are 2 or more risers in a condo or house built under the IBC and to only require handrails when 4 or more risers when single family house or townhouse is built under the IRC. The same types of people are living in these structures and they are often built on same street by the same builder.

It should be noted that the last sentence of Section R310 for R-3 states “Adult and Child care facilities that are within a single-family home are permitted to comply with the International Residential Code” which would allow the conditions this change proposes.

Cost Impact: The code change proposal will reduce the cost of construction.

Analysis: Section 308.5 would limit adult and child care facilities in Group R-3 to five or fewer persons.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: This proposal would coordinate the IBC and IRC requirements for stairways in Group R-2 and R-3 with three of fewer risers. The hazard does not increase for this situation between single family homes and within a townhouse or apartment.

Assembly Action:

None

Final Hearing Results

E70-06/07

AS

Code Change No: E74-06/07

Original Proposal

Sections: 1010.5.1 (IFC [B] 1010.5.1)

Proponent: William W. Stewart, Chesterfield, MO, representing himself

Revise as follows:

1010.5.1 Width. The minimum width of a means of egress ramp shall not be less than that required for corridors by Section 1017.2. The clear width of a ramp ~~and the clear width between handrails, if provided, or other permissible projections~~ shall be 36 inches (914 mm) minimum.

Reason: Ramps require handrails on both sides per 1010.8 thus the deleted text is redundant. It is also misleading because it implies ramps do not need handrails on both sides. If the slope is less than 1:20 then the walking surface is not a ramp and is not regulated by this section. Other permissible projections are introduced because someone might think that ramp curbs and similar components should be included in the width if a ramp.

Cost Impact: The code change will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Modified

Modify the proposal as follows:

1010.5.1 Width. The minimum width of a means of egress ramp shall not be less than that required for corridors by Section 1017.2. The clear width of a ramp between handrails, if provided, or other permissible projections shall be 36 inches (914 mm) minimum.

Committee Reason: The proposal will clarify that the clear width for an ramp is all the way down from the handrails to the ground. The term *if provided* was added back in as a modification to allow for ramps with a rise of less than 6 inches not having handrails.

Assembly Action:

None

Final Hearing Results

E74-06/07

AM

Code Change No: E75-06/07

Original Proposal

Sections: 1010.6.3, 1010.6.4 (IFC [B] 1010.6.3, [B] 1010.6.4)

Proponent: John Rooney, United Spinal Association

Revise as follows:

1010.6.3 Length. The landing length shall be 60 inches (1525 mm) minimum.

Exceptions:

1. ~~Landings in nonaccessible~~ Group R-2 and R-3 individual dwelling and sleeping units that are not required to be Accessible, Type A or Type B units in accordance with Section 1107, landings are permitted to be 36 inches (914 mm) minimum.
2. Where the ramp is not a part of an accessible route, the length of the landing shall not be required to be more than 48 inches (1220 mm) in the direction of travel.

1010.6.4 Change in direction. Where changes in direction of travel occur at landings provided between ramp runs, the landing shall be 60 inches by 60 inches (1524 mm by 1524 mm) minimum.

Exception: ~~Landings in nonaccessible~~ Group R-2 and R-3 individual dwelling or sleeping units that are not required to be Accessible, Type A or Type B units in accordance with Section 1107, landings are permitted to be 36 inches by 36 inches (914 mm by 914 mm) minimum.

Reason: The purpose of this change is for code clarification. This change specifies where the exceptions are not permitted (i.e. within Accessible, Type A or Type B dwelling or sleeping units). The three levels of accessibility for units can lead to discussions about what is accessible. This language is more specific.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The proposed language for >wet= conditions is too vague and open to opinion. A question would be if just the possibility of tracking water into an area would constitute a wet condition.

Assembly Action:

None

Final Hearing Results

E75-06/07

AS

Code Change No: **E77-06/07**

Original Proposal

Sections: 1010.9 (IFC [B] 1010.9)

Proponent: Ed Roether, HOK SVE

Revise as follows:

1010.9 Edge protection. Edge protection complying with Sections 1010.9.1 or 1010.9.2 shall be provided on each side of ramp runs and at each side of ramp landings.

Exceptions:

1. Edge protection is not required on ramps that are not required to have handrails, provided they have flared sides that comply with the ICC A117.1 curb ramp provisions.
2. Edge protection is not required on the sides of ramp landings serving an adjoining ramp run or stairway.
3. Edge protection is not required on the sides of ramp landings having a vertical dropoff of not more than 0.5 inch (12.7 mm) within 10 inches (254 mm) horizontally of the required landing area.
4. In assembly spaces with fixed seating, edge protection is not required on the sides of ramps where the ramps provide access to the adjacent seating and aisle accessways.

Reason: The current requirements for ramp edge protection are applicable to all ramps, including those in assembly seating. While 1010.9.2 could cover a ramp that went up with the sloped seating, the exception is attached to the location of the handrail. Ramped aisles may not have handrails, or may have a central handrail.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The proposed text clarifies the code and reduces a potential tripping hazard along access to the seats.

Assembly Action:

None

Final Hearing Results

E77-06/07

AS

Code Change No: **E78-06/07**

Original Proposal

Sections: 1010.9.1 (IFC [B] 1010.9.1)

Proponent: John Rooney, United Spinal Association

Revise as follows:

1010.9.1 Curb, rail, wall or barrier. A curb, rail, wall or barrier shall be provided to serve as edge protection. A curb must be a minimum of 2 inches (51mm) in height. Barriers must be constructed so that the barrier prevents the passage of a 4-inch-diameter (102 mm) sphere, where any portion of the sphere is within 4 inches (102 mm) of the floor or ground surface.

CODE CHANGES RESOURCE COLLECTION – INTERNATIONAL BUILDING CODE

Reason: The proposed change will harmonize the code language with Section 405.9.2 of ICC/ANSI A117.1 and Section 405.9.2 of the ADA/ABA Guidelines. The laundry list is not needed since a “rail” or “wall” are types of barriers.

The proposal for a 2” dimension for a curb is consistent with current ADAAG. The new ADA/ABA Guidelines and ICC A117.1 do not indicate the height requirements if a curb option is chosen.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The proposed 2 inch minimum high curb would conflict with the requirements in ICC A117.1 and the new ADA/ABA Accessibility Guidelines which require a 4 inch minimum high curb.

Assembly Action:

None

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because public comments were submitted.

Public Comment 2:

John Rooney, United Spinal Association, requests Approval as Modified by this public comment.

Modify proposal as follows:

1010.9.1 Curb, rail, wall or barrier. A curb, rail, wall or barrier shall be provided to serve as edge protection. A curb must be a minimum of 2 inches (51 mm) ~~4 inches (102 mm)~~ in height. Barriers must be constructed so that the barrier prevents the passage of a 4-inch-diameter (102 mm) sphere, where any portion of the sphere is within 4 inches (102 mm) of the floor or ground surface.

Commenter's Reason: The proposed deletion of “rail, wall” has been withdrawn from this proposal. The important issue is to identify the height of a curb when that option is chosen. The current language is not clear. Two proposals are offered to allow the members to decide on which curb height should be required – 2” or 4”. Testimony during the hearings indicated that the language in the new ADA/ABA Guideline (which do not give a specific requirement for curbs) could be interpreted as requiring a 4” high curb.

Final Hearing Results

E78-06/07

AMPC2

Code Change No: E82-06/07

Original Proposal

Sections: 1011.4, Chapter 35 (IFC [B] 1011.4, Chapter 45)

Proponent: Manny Muniz, Manny Muniz Associates, LLC, representing himself

1. Revise as follows:

1011.4 Internally illuminated exit signs. Internally illuminated exit signs shall be listed and labeled in accordance with UL 924 and shall be installed in accordance with the manufacturer’s instructions and Section 2702. Exit signs shall be illuminated at all times.

2. Add new standard to Chapter 35 as follows:**Underwriters Laboratories (UL)**UL 924-06, Standard for Safety Emergency Lighting and Power Equipment

Reason: The purpose of the change is to clarify what standard internally illuminated exit signs shall be listed and labeled to. A requirement for a safety device to be listed must identify the standard that the device must be listed to. The code cannot require a device to be listed but then stay silent as to what standard it should be listed in accordance with. This section of the code would most likely be looked at by the courts as ambiguous, unclear and perhaps even unenforceable.

The Life Safety Code (NFPA 101), which is used in every state in the US, contains a similar requirement in Section 7.10.7.1 which does identify UL 924, Standard for Safety Emergency Lighting and Power Equipment, as the standard that internally illuminated exit signs must be listed to.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: The standard UL 924-06 has been reviewed for compliance with ICC Council Policy #28, Section 3.6. In the opinion of ICC Staff, the standard complies with ICC Criteria for referenced standards.

Public Hearing Results

Committee Action:**Approved as Submitted**

Committee Reason: UL 924 is an appropriate standard for illumination of exit signage. The standard has been revised to meet ICC criteria.

Assembly Action:**None**

Final Hearing Results

E82-06/07**AS**

Code Change No: **E83-06/07**

Original Proposal

Sections: 1011.4, Chapter 35 (IFC [B] 1011.4, Chapter 45)**Proponent:** Bob Eugene, Underwriters Laboratories, Inc.**1. Revise as follows:**

1011.4 Internally illuminated exit signs. Electrically powered internally illuminated, self-luminous and photoluminescent exit signs shall be listed and labeled in accordance with UL 924 and shall be installed in accordance with the manufacturer's instructions and Section 2702. Exit signs shall be illuminated at all times.

2. Add standard to Chapter 35 as follows:**UL**UL 924-06 Emergency Lighting and Power Equipment

Reason: The purpose is broadening the scope of this section to include self-luminous and photoluminescent exit signs and to add the specific standard for listing of these illuminated exit signs.

The reason for the change is to provide flexibility and to add clarity to the user. Internally powered covers all exit signs that generate their own luminosity. Using the phrase "electrically-powered" will capture LED, incandescent, fluorescent, and electroluminescent. In combination with self-luminous and photoluminescent, that covers the full range of product types currently in the market.

UL 924 applies to emergency lighting and power equipment for use in unclassified locations and intended for connection to branch circuits of 600 volts or less. Such equipment is intended to automatically supply illumination or power or both to critical areas and equipment in the event of failure of the normal supply, in accordance with Article 700 or 701 of the National Electrical Code, NFPA 70, the Life Safety Code, NFPA 101, and the International Building Code, IBC. EXIT SIGN is general term used to refer to an Exit Light, Exit Fixture, and Self-Luminous or Photoluminescent Exit Sign.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: A concern would be if the reference to Section 2702 for self-luminous and photoluminescent signage could be interpreted as a power requirement for signs that use no power.

The standard UL 924-06 has been reviewed for compliance with ICC Council Policy #28, Section 3.6. In the opinion of ICC Staff, the standard complies with ICC Criteria for referenced standards.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: Indicating the three types of exit signage permitted is a good clarification for the code, UL 924 is an appropriate standard for illumination of exit signage. The standard has been revised to meet ICC criteria.

Assembly Action:

None

Final Hearing Results

E83-06/07

AS

Code Change No: E84-06/07

Original Proposal

Sections: 403.15 (New); 1011.6, Chapter 35 (IFC 1011.6, Chapter 45)

Proponent: William M. Connolly, State of New Jersey, Department of Community Affairs, Division of Codes and Standards, representing International Code Council Ad Hoc Committee on Terrorism Resistant Buildings

1. Add new text as follows:

403.15 Exit path markings. Exit path markings shall be provided in accordance with Section 1011.6.

1011.6 Photoluminescent exit path markings: Photoluminescent exit path markings (outlining stripes) complying with UL 1994 shall be provided in buildings of Group B, E, M, and R-1 with occupied floors greater than 75 feet above the lowest level of fire department vehicle access. Exit stairways where photoluminescent exit path markings are required shall be continuously illuminated and lighting shall not be controlled by motion sensors or timers.

1011.6.1 Markings (outlining stripes) within vertical exits: Markings within vertical exits shall comply with Section 1011.6.1.1 through Section 1011.6.1.4.

1011.6.1.1 Steps: Outlining stripes shall be applied to the horizontal leading edge of each step and shall extend for the full length of the step. Outlining stripes shall have a minimum horizontal width of 1 inch (25 mm) and a maximum width of 2 inches (51 mm). The leading edge of the stripe shall be placed at a maximum of ½ inch (13 mm) from the leading edge of the step and the stripe shall not overlap the leading edge of the step by not more than ½ inch (13 mm) down the vertical face of the step.

1011.6.1.2 Landings: The leading edge of landings in exits shall be marked with outlining stripes consistent with the dimensional requirements for steps and shall be the same length as and consistent with the stripes on the steps or shall extend the full length of the leading edge of the landing.

1011.6.1.3 Handrails: All handrails and handrail extensions shall be marked with a stripe having a minimum width of 1 inch (25 mm). The stripe shall be placed on the top surface of the handrail for the entire length of the handrail, including extensions and newel post caps. Where handrails or handrail extensions bend or turn corners, the stripe shall not have a gap of more than 4 inches (102 mm).

1011.6.1.4 Floor perimeter demarcation stripes: Stair landings and other parts of the egress path, with the exception of the sides of steps, shall be provided with demarcation lines on the floor or on the walls or a combination of both. The stripes shall be 1 (25 mm) to 2 inches (51 mm) wide with interruptions not exceeding 4 inches (102 mm).

1011.6.1.4.1 Floor mounted demarcation lines: Perimeter demarcation lines shall be placed within 4 inches of the wall and shall extend to within 2 inches (51 mm) of the markings on the leading edge of landings. The demarcation lines shall continue across the floor in front of all doors.

1011.6.1.4.2 Wall mounted demarcation lines: Perimeter demarcation lines shall be placed on the bottom edge of the wall no more than 4 inches (102 mm) above the finished floor. At the top or bottom of the stairs, demarcation lines shall drop vertically to the floor within 2 inches (51 mm) of the step or landing edge. Demarcation lines on walls shall transition vertically to the floor and then extend across the floor where a line on the floor is the only practical method of outlining the path. Demarcation lines on walls shall continue across the face of all doors or may transition to the floor and extend across the floor in front of such doors.

2. Add standard to Chapter 35 (IFC Chapter 45) as follows:

UL

UL 1994-04 Luminous Egress Path Marking Systems, with revisions through February, 2005

Reason: This code change proposal is one of fourteen proposals being submitted by the International Code Council Ad Hoc Committee on terrorism Resistant Buildings.

The purpose of this code change is to add new requirements for photoluminescent exit path markings into the code.

The proposed new section on exit path markings will require photoluminescent exit path markings be provided in vertical exit enclosures. The Code currently has no requirements for the installation of these markings. This proposal will facilitate rapid egress and assist in full building evacuation and is drawn from Recommendations 17 and 18 of the National Institute of Standards and Technology's (NIST) report on the World Trade Center tragedy.

Up to this point, code requirements for high rise buildings were written under the assumption that the building would be evacuated floor by floor. In most instances, in a building with a full suppression system, only the floor where the fire is located and the floors immediately above and below would be evacuated. Acts of terrorism and accidental incidents like power failures have made it necessary to consider design for full building evacuation that is as rapid as possible. This may be made necessary in response to an event within the building or an event outside the building. The proposed code change to require exit path markings is intended to facilitate the most rapid possible full building evacuation.

In the City of New York, after the first bombing of the WTC, requirements were instituted to require exit path markings in vertical exit enclosures. This proposal is taken directly from those requirements.

New Section 1011.6 establishes the base requirement for the markings and requires compliance with UL 1994, a standard developed using an approved consensus process. As per this new section, the markings are required only in vertical exit enclosures. This is unlike previously unsuccessful proposals that attempted to establish requirements for low-level exit signage and exit access markings. The remainder of the new text establishes the minimum requirements for the markings.

Bibliography:

1. Reference Standard 6-1, Photoluminescent exit path markings as required by Local Law 26 of 2004, New York City Building Code, § 27-383(b)
2. National Institute of Standards and Technology. Final Report of the National Construction Safety Team on the Collapses of the World Trade Center Towers. United States Government Printing Office: Washington, D.C. September 2005.
3. UL 1994

Cost Impact: This proposal establishes a requirement for markings in vertical exit enclosures, which may increase costs, but only very modestly. The proponents believe that the decrease in egress and full building evacuation time outweighs the moderate cost of the markings.

Analysis: The standard UL 1994-04 has been reviewed for compliance with ICC Council Policy #28, Section 3.6. In the opinion of ICC Staff, the standard complies with ICC Criteria for referenced standards.

The action on the proposed change to Section 403.15 is dependent on the decision of the Means of Egress Committee to the remainder of the proposal, therefore, for consistency, the MEO Committee will make the determination for the entire proposal.

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The committee agreed the intent for egress guidance had merit, but believed that there were other products that could address the exiting issues raised. Several proponents had similar proposals. The committee asked the proponents to work together to resolve issues brought up during the discussions. The proposal should be technology neutral - not just for photoluminescent materials. The markings should delineate the exit path in the enclosed exit stairway. An additional concerns about E84-06/07 was that there was no explanation of the limitation to Groups B, E, M and R-1. Of special concern was no inclusion of Groups A and I. This proposal also extended the requirements outside the exit stairway by the wording in proposed Section 1011.6.

Assembly Action:

None

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because public comments were submitted.

Public Comment 2:

James P. Colgate, RA, Esq., Executive Architect, New York City Department of Buildings, requests Approval as Modified by this public comment.

Modify proposal as follows:

403.15 Exit path markings. Exit path markings shall be provided in accordance with Section 1027.4044.6.

1027 EXIT PATH MARKINGS

1027.1 General. 4044.6 Photoluminescent exit path markings: Photoluminescent Approved luminous exit path markings delineating the exit path (outlining stripes) complying with UL 4994 shall be provided in exit enclosures, including vertical exit enclosures and exit passageways, of buildings of Group A, B, E, I, M, and R-1 with having occupied floors greater located more than 75 feet (22 860 mm) above the lowest level of fire department vehicle access and shall comply with Sections 1027.1.1 through 1027.1.7. Exit stairways where photoluminescent exit path markings are required shall be continuously illuminated and lighting shall not be controlled by motion sensors or timers.

Exception: Exit path markings shall not be required in lobbies or areas of open parking garages, where such lobby or area is located on the level of exit discharge and complies with the exception to Section 1023.1.

1044.6.1 Markings (outlining stripes) within vertical exits: Markings within vertical exits shall comply with Section 1044.6.1.1 through Section 1044.6.1.4.

1027.1.1 1044.6.1.1 Steps: ~~Outlining A stripes shall be applied to the horizontal leading edge of each step and shall extend for the full length of the step. Outlining stripes shall have a minimum horizontal width of 1 inch (25 mm) and a maximum width of 2 inches (51 mm). The leading edge of the stripe shall be placed at a maximum of ½ inch (13 mm) from the leading edge of the step and the stripe shall not overlap the leading edge of the step by not more than ½ inch (13 mm) down the vertical face of the step.~~ Outlining A stripes shall be applied to the horizontal leading edge of each step and shall extend for the full length of the step. Outlining stripes shall have a minimum horizontal width of 1 inch (25 mm) and a maximum width of 2 inches (51 mm). The leading edge of the stripe shall be placed at a maximum of ½ inch (13 mm) from the leading edge of the step and the stripe shall not overlap the leading edge of the step by not more than ½ inch (13 mm) down the vertical face of the step.

1027.1.2 1044.6.1.2 Landings: ~~The leading edge of landings in exits shall be marked with outlining a stripes consistent with the dimensional requirements for steps and shall be the same length as and consistent with the stripes on the steps or shall extend the full length of the leading edge of the landing.~~ The leading edge of landings in exits shall be marked with outlining a stripes consistent with the dimensional requirements for steps and shall be the same length as and consistent with the stripes on the steps or shall extend the full length of the leading edge of the landing.

1027.1.3 1044.6.1.3 Handrails: All handrails and handrail extensions shall be marked with a stripe having a minimum width of 1 inch (25 mm). The stripe shall be placed on the top surface of the handrail for the entire length of the handrail, including extensions and newel post caps. Where handrails or handrail extensions bend or turn corners, the stripe shall not have a gap of more than 4 inches (102 mm).

1027.1.4 1044.6.1.4 Floor perimeter demarcation lines stripes: ~~Stair landings and other parts of the floor areas within exit enclosures egress path, with the exception of the sides of steps, shall be provided with demarcation lines on the floor or on the walls or a combination of both. The stripes shall be 1 (25 mm) to 2 inches (51 mm) wide with interruptions not exceeding 4 inches (102 mm).~~ Stair landings and other parts of the floor areas within exit enclosures egress path, with the exception of the sides of steps, shall be provided with demarcation lines on the floor or on the walls or a combination of both. The stripes shall be 1 (25 mm) to 2 inches (51 mm) wide with interruptions not exceeding 4 inches (102 mm).

1027.1.4.1 1044.6.1.4.1 Floor mounted demarcation lines: ~~Perimeter demarcation lines shall be placed within 4 inches of the wall and shall extend to within 2 inches (51 mm) of the markings on the leading edge of landings. The demarcation lines shall continue across the floor in front of all doors.~~ Perimeter demarcation lines shall be placed within 4 inches of the wall and shall extend to within 2 inches (51 mm) of the markings on the leading edge of landings. The demarcation lines shall continue across the floor in front of all doors.

Exception: Demarcation lines shall not extend in front of exit doors that lead out of an exit enclosure and through which occupants must travel to complete the exit path.

1027.1.4.2 1044.6.1.4.2 Wall mounted demarcation lines: ~~Perimeter demarcation lines shall be placed on the wall with the bottom edge of the stripe wall no more than 4 inches (102 mm) above the finished floor. At the top or bottom of the stairs, demarcation lines shall drop vertically to the floor within 2 inches (51 mm) of the step or landing edge. Demarcation lines on walls shall transition vertically to the floor and then extend across the floor where a line on the floor is the only practical method of outlining the path. Where the wall line is broken by a door, demarcation lines on walls shall continue across the face of the all doors or may transition to the floor and extend across the floor in front of such doors.~~ Perimeter demarcation lines shall be placed on the wall with the bottom edge of the stripe wall no more than 4 inches (102 mm) above the finished floor. At the top or bottom of the stairs, demarcation lines shall drop vertically to the floor within 2 inches (51 mm) of the step or landing edge. Demarcation lines on walls shall transition vertically to the floor and then extend across the floor where a line on the floor is the only practical method of outlining the path. Where the wall line is broken by a door, demarcation lines on walls shall continue across the face of the all doors or may transition to the floor and extend across the floor in front of such doors.

Exception: Demarcation lines shall not extend in front of exit doors that lead out of an exit enclosure and through which occupants must travel to complete the exit path.

1027.1.4.3 Transition. ~~Where a wall mounted demarcation line transitions to a floor mounted demarcation line, or vice-versa, the wall mounted demarcation line shall drop vertically to the floor to meet a complimentary extension of the floor mounted demarcation line, thus forming a continuous marking.~~ Where a wall mounted demarcation line transitions to a floor mounted demarcation line, or vice-versa, the wall mounted demarcation line shall drop vertically to the floor to meet a complimentary extension of the floor mounted demarcation line, thus forming a continuous marking.

1027.1.5 Uniformity. Placement and dimensions of markings shall be consistent and uniform throughout the same exit enclosure.

1027.1.6 Materials. ~~Luminescent exit path markings shall be permitted to be made of any material, including paint, provided that an electrical charge is not required to maintain the required luminance. Such materials shall include, but not limited to, self-luminous materials and photoluminescent materials. Materials shall comply with either:~~ Luminescent exit path markings shall be permitted to be made of any material, including paint, provided that an electrical charge is not required to maintain the required luminance. Such materials shall include, but not limited to, self-luminous materials and photoluminescent materials. Materials shall comply with either:

1. UL 1994, or
2. ASTM E 2072, except that the charging source shall be 1 fc (10 lux) of fluorescent illumination for 60 minutes, and the minimum luminance shall be 5 milicandelas per square meter after 90 minutes. **1027.1.7 Illumination.** Exit enclosures where photoluminescent exit path markings are installed shall be provided with the minimum means of egress illumination required by Section 1006 for at least 60 minutes prior to periods when the building is occupied.

1027.1.7 Illumination. Exit enclosures where photoluminescent exit path markings are installed shall be provided with the minimum means of egress illumination required by Section 1006 for at least 60 minutes prior to periods when the building is occupied.

Chapter 35 (IFC Chapter 45):

UL

UL 1994-04 Luminous Egress Path Marking Systems, with revisions through February, 2005

ASTM

ASTM E 2072-04 Standard Specification for Photoluminescent (Phosphorescent) Safety Markings

Commenter's Reason: The Means of Egress Committee agreed that the intent of the provision has merit. However, because of the great number of similar proposals, the committee asked that the various proponents work together to resolve the issues. This comment amends the text from proposal E84 and draws on the standards of proposal E142. Among other recommendations, the Means of Egress Committee requested that the revised proposal be "technology neutral."

"TECHNOLOGY NEUTRAL": A fundamental characteristic of good governmental regulation is that, to the extent possible, it does not specify particular technologies, so that competition and innovation are fostered. However, the issue of technological neutrality must not be confused with the sensible restriction of materials proven to be inappropriate to a particular fire and life safety requirement. Electrically-based exit path systems are good systems that can provide much brighter luminance than photoluminescent materials, and are very useful in the right applications. However, we need to ask why we are requiring exit path markings in high-rise stairways, and whether electrically-based systems are appropriate for this specific code requirement.

For high-rise buildings, the IBC already requires electrical back-up to both exit lighting and those smokeproof enclosures that utilize mechanical means. So in an emergency condition where the backup power operates as designed, the stairs will remain lighted and smokeproof, rendering the exit path markings of limited utility. The real import of exit path markings is to provide a safe system of way-guidance in the dark, i.e. when even the backup power fails.

The lessons learned from the 1993 terrorist bombing of the World Trade Center resulted in many upgrades to the complex, including the installation of luminous exit path markings in the exits. The markings installed were photoluminescent, which meant that once the ambient lighting was removed, they will remain luminous without any additional electrical charge.

On 9/11, these exit path markings were put to use, and were later credited by NIST as a feature that aided the evacuation of the towers. The water in the stairs from the sprinklers did not affect the photoluminescent markings because there was no electrical wiring or circuitry to get wet or short-circuit. The explosion and vibration did not affect the photoluminescent markings because there were no wires or circuits to sever. The fire and heat on the upper floors did not affect the photoluminescent markings on the lower floors since there were no wires or circuits to melt or burn. On 9/11, the exit path markings worked, unlike other, electrically-based features that failed that day, because the photoluminescent markings did not rely on electricity, alarms, wires, or circuitry.

The extensive experience that the New York City Department of Buildings has had with egress failures in high rise buildings underscores this point. We are responsible for approximately 8,000 high rise buildings. When the August 2003 Northeast power grid blackout hit New York City, many of our high-rise buildings' emergency exit lighting systems failed, including in the municipal office building in which I work. Most of the failures stemmed from faulty maintenance of batteries or generators, and in some cases from improper installations. But the fact is that many people, including me and my staff, were left wholly in the dark.

New York City took the lead in this area and, pursuant to its in-depth Report of the World Trade Center Building Code Task Force, enacted a local law in 2004 requiring exit path markings that do not rely on electricity, despite objections from the electroluminescent industry. The local law requires photoluminescent exit path markings to be installed retroactively in all of our approximately 1,700 existing high-rise office buildings.

To argue that electrically-based path making must be permitted in this code change, in the name of technological neutrality, is thus incorrect. Rather, what we must do as code officials charged with protecting the public is to distinguish between "technology neutral" and "technology appropriate." New York City's assessment is that electrically-based exit path systems in high rise buildings that already have backup power and smokeproof enclosures is not the appropriate technology. What is appropriate is a system of luminous markings that do not rely on an electrical charge, which is what this comment, if approved, would require.

OTHER COMMENTS:

1. **Section 403.13.** The only modification here is to point the user to the new section 1027.
2. **Section 1011.** The original proposal would have appended the requirements for exit path markings to Section 1011, which currently deals only with exit signs – i.e. the signs placed above doors and near the ceiling directing people to exits. Rather than complicate Section 1011 with an unrelated new concept of path markings to be located only within enclosed exits, a new Section 1027 is added to include all the low-location exit path markings. This now neatly divides the two topics, similar to New York City's local modifications to the IBC. Therefore, the title of Section 1011 reverts to the current IBC text; all exit path markings are relocated to Section 1027.
3. **Section 1027.1 (formerly 1011.6).** The term "outlining stripes" is deleted because of possible confusion with the subsequent term "demarcation lines"; instead, the phrase "delineating the exit path" is added, as requested by the Means of Egress Committee to clarify what the markings are intended to do. The text of the original proposal would have required exit path markings for the entire "exit path" or "egress path", which could include all portions of the means of egress including exit access – and would therefore have been too broad a requirement. The Means of Egress Committee recommended modifying the proposal in application only to the "enclosed exit stairway". But only the enclosed exit stairway would have been too narrow, since it would not have included enclosed transfer exit passageways – the marking of which was deemed important by the WTC Building Code Task Force. Therefore, the phrase "exit enclosures, including vertical exit enclosures and exit passageways" is added to specify where in the high rise building exit path markings are required, and make clear that exit access corridors are not included. For organizational improvement, the requirements for materials (reference standards) and lighting are relocated to Sections 1027.1.6 and 1027.1.7. Group A and I occupancies are added in response to concerns expressed by the Means of Egress Committee; the nature of these occupancies, and the occupants' lack of familiarity with the exits, justifies the safeguards as a minimum requirement. In addition, an exception is added to exempt lobbies at the level of exit discharge.
4. **Former section 1011.6.1.** Due to the simplified organization, the scoping provisions formerly contained in section 1011.6.1 are now incorporated in to Section 1027.1. Therefore, the former section 1011.6.1 is deleted.

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5. **Section 1027.1.1 (formerly 1011.6.1.1).** The term “outlining stripes” is deleted because of possible confusion with the subsequent term “demarcation lines”. The minimum 1” width is maintained, as it is crucial to achieve minimum visibility for the visually impaired, and follows established 1” minimum standards (e.g., ASTM E 2072-04 and NYC RS 6-1). The 2” maximum width is crucial to prevent the visual illusion that occurs in the dark when overly-thick markings on the various steps merge into one glowing object; the 2” maximum follows an established requirement (e.g., NYC RS 6-1). The maximum ½” overlap is important to prevent confusion in the dark by making clear to the occupant what represents the top plane of the steps, following an established minimum requirement (e.g., NYC RS 6-1).
6. **Section 1027.1.2 (formerly 1011.6.1.2).** The term “outlining stripes” is deleted because of possible confusion with the subsequent term “demarcation lines”. The word “exit” is removed because this idea is already provided for in the scoping provisions for Section 1027.1. The last phrase is removed as it is redundant.
7. **Section 1027.1.3 (formerly 1011.6.1.3).** The minimum 1” width is maintained, as it is crucial to achieve minimum visibility for the visually impaired, and follows established 1” minimum standards (e.g., ASTM E 2072-04 and NYC RS 6-1).
8. **Section 1027.1.4 (formerly 1011.6.1.4).** As requested by the Means of Egress Committee, the proposal is modified to be specific that it only applies to the exit enclosures. The minimum 1” width is maintained, as it is crucial to achieve minimum visibility for the visually impaired, and follows established 1” minimum standards (e.g., ASTM E 2072-04 and NYC RS 6-1).
9. **Section 1027.1.4.1 (formerly 1011.6.1.4.1).** An exception is added to clarify that markings shall not extend in front of discharge doors.
10. **Section 1027.1.4.2 (formerly 1011.6.1.4.2).** A clarification is added indicating from where the 4” measurement is taken. This will allow the stripe to be placed above a standard 3 ½ -inch base molding, while still keeping the stripe low enough to signify to the occupant that it represents the intersecting planes of the wall and the floor. In tests conducted by NYC prior to the establishment of its RS 6-1, luminescent markings that were placed too high on the wall caused occupants to be unable to discern in the dark where the floor was. Language is added to clarify the two options for marking the door – either across the door or on the floor in front of it. An exception is added to clarify that markings shall not extend in front of discharge doors.
11. **Section 1027.1.4.3.** Clarifies ambiguous language in the former Section 1016.6.1.4. The new language makes clear that the owner has the option of wall-mounted or floor-mounted stripes, and that the stripes may transition from one to the other.
12. **Section 1027.1.5.** Clarifies that the placement and dimensions must be uniform.
13. **Section 1027.1.6.** Relocates the technical requirements for the materials to this section for organizational improvement. ASTM E 2072 is added as an option, in addition to UL 1994. (Note that ASTM E 2072 had been specified in Proposal E 142 by David Frable, US GSA, and was found to comply with ICC Council Policy #28). The original E84 proposal provided UL 1994 as the only standard. However, UL 1994 does not recognize the use of photoluminescent paints, which the New York City Department of Buildings has found an important type of product to achieve safe results and avoid tripping hazards, particularly in retrofits where the substrate is more likely to be uneven. ASTM E 2072 permits photoluminescent paints, and is therefore added for technological neutrality, in accordance with the comments of the Means of Egress Committee. The addition of ASTM E2073 as an option pulls together the proposals E84 and E142. The charging source for ASTM E 2072 has been changed to 1 footcandle with 5 mcd/m² to be consistent with the means of egress illumination requirements of IBC Section 1006.2.
14. **Section 1027.1.7.** The illumination provisions for photoluminescent products have been relocated from 1011.6 to this new subsection to provide additional clarity.

A note about New York City’s Reference Standard RS 6-1. The International Code Council’s Ad Hoc Committee on Terrorism-Resistant Buildings’ proposal for E84 was based in large part on NYC’s RS 6-1, and there are therefore many references to NYC RS 6-1 in this comment. The NYC RS 6-1 was developed by the New York City Department of Buildings’ architects and engineers after over one year of research of all available relevant standards, including but not limited to those published by the ASTM, UL, ISO, IMO, APTA (American Public Transportation Association). In addition, the department performed outreach and consultation with the various industries, including those from overseas. The Buildings Department also inspected mock-up/test installations of luminescent markings in various permutations, with different placement and dimensional configurations, to ensure that the resulting standards were adequate and appropriate. The result of all this research was a draft standard that was published for public comment – the public hearing on the proposal drew over 80 attendees representing a wide range of egress and safety experts. As a result of the public comment, the draft standard was refined and published in final form on May 31, 2005. Since then over 1000 installations have been completed in high rise buildings pursuant to this standard. It is on the basis of this experience that this comment is being made.

Bibliography:

1. ASTM E 2072-04, Standard Specification for Photoluminescent (Phosphorescent) Safety Markings
2. National Institute of Standards and Technology. Final Report of the National Construction Safety Team on the Collapse of the World Trade Center Towers. United States Printing Office: Washington, DC. September 2005.
3. City of New York, Department of Buildings. Building Code Reference Standard RS 6-1 and 6-1A (available at http://www.nyc.gov/html/dob/downloads/pdf/rs_6-1.pdf). Promulgated May 31, 2005.
4. City of New York, Department of Buildings. Word Trade Center Building Code Task Force: Findings and Recommendations (available at <http://home2.nyc.gov/html/dob/downloads/pdf/wtcbctf.pdf>). February, 2003.
5. City of New York. Local Law 26 of 2004, Section 15, modifying Building Code Section 27-283 (available at http://www.nyc.gov/html/dob/downloads/bldgs_code/locallaw26of04.pdf). Enacted May 24, 2004.
6. UL 1994-04, Luminous Egress Path Marking Systems, with revisions through February, 2005.

Cost impact: The statements made by the original proponent of E84 about the cost impacts are not affected by the amendments proposed herein.

Final Hearing Results

E84-06/07

AMPC2

Code Change No: **E86-06/07**

Original Proposal

Sections: 1012.2 (IFC [B] 1012.2)

Proponent: Robert Bagnetto, Lapeyre Stair, Inc./Laitram Corp.

Revise as follows:

1012.2 Height. Handrail height, measured above stair tread nosings, or finish surface of ramp slope, shall be uniform, not less than 34 inches (864 mm) and not more than 38 inches (965 mm). Handrail height of alternating tread devices, measured above tread nosings shall be uniform, not less than 30 inches (762 mm) and not more than 34 inches (864 mm).

Reason: The purpose of this proposed change is to replace the current handrail height requirements for alternating tread devices, which are inappropriately based on the handrail height requirements for traditional type stairs, with new handrail height requirements more appropriate to alternating tread devices.

This proposal is superior to the current provisions of the code in that it rectifies shortcomings in the existing code for alternating tread device handrail height. The current required handrail height of alternating tread devices of 34 inches to 38 inches is based on the required handrail height of traditional type stairs which have stair angles much lower than alternating tread devices. This alternating tread device handrail height appears to have been chosen arbitrarily, assuming that the handrail height best suited for traditional type stairs would also be best for alternating tread devices. Although they have treads as a traditional stair does, alternating tread devices have considerable different characteristics (the most important being a much steeper angle) from a traditional stair and thus the requirements for the features for an alternating tread device often must differ from a traditional stair. The alternating tread device features result in differences of handrail use such as, different arm posture, the hand gripping the handrail near a higher part of the body and the use of the handrails under the arms for stabilization. Therefore, a lower handrail height of 30 inches to 34 inches is more appropriate for alternating tread devices.

Alternating tread devices have been used for approximately 25 years with handrail heights (measured vertically from the tread nosings to the top of the handrail) of approximately 32 inches. Lapeyre Stair is not aware of any cases where this handrail height has been a problem for users of alternating tread devices. Prior to release of the alternating tread device, Lapeyre Stair performed informal testing to verify that this is the most appropriate handrail height. Additionally, a scientific study titled "Performance, perceived safety and comfort of the alternating tread stair" was performed that demonstrated the satisfactory use of alternating tread devices. The 34 inch to 38 inch handrail height requirement for alternating tread devices appears to have first been introduced in sections 1003.3.3.10.1 and 1003.3.3.11.1 of IBC-2000 and then carried forward to sections 1009.10.1 and 1009.11.1 of IBC-2003. The precursor codes to IBC appear either not to discuss alternating tread device handrail height or to allow whatever handrail height provides safe use of the device. (Ref: BOCA-1999 Sections 1014.6.6.1 and 1022.2.5, SBC-1999 Section 1007.8.4 and 1007.8.5; UBC Section 1003.3.3.1). Furthermore, Lapeyre Stair is not aware of any documented scientific testing to verify that the current handrail heights in IBC for alternating tread devices are the most appropriate. Finally, an IBC code interpretation letter dated July 23, 2004 to Fanning/Howley Associates Inc, indicates that the current handrail height in the IBC may not be appropriate for alternating tread devices, and a code official could approve an alternating tread device with a handrail height inconsistent with IBC, Section 1012.2.

The lower handrail height for alternating tread devices does not substantially alter the design of alternating tread devices, and actually results in less occupied space which could minimally lower costs.

Bibliography:

The BOCA National Building Code/1999 Sections 1014.6.6.1 & 1022.2.5

Standard Building Code 1999 Edition Sections 1007.8.4 & 1007.8.5

1997 Uniform Building Code Section 1003.3.3.1 (exception)

Performance, perceived safety and comfort of the alternating tread stair by Jorna, Mohageg & Synder Virginia Polytechnic Institute and State University, published Applied Ergonomics 1989.20.1,26-32

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: It is reasonable on alternating tread devices to allow for a lower handrail for safety reasons.

Assembly Action:

None

Final Hearing Results

E86-06/07

AS

Code Change No: **E88-06/07**

Original Proposal

Sections: 1012.3 (IFC [B] 1012.3)

Proponent: David W. Cooper, Stairway Manufacturers' Association

Revise as follows:

1012.3 Handrail graspability. All required handrails shall meet Type I criteria as follows or shall provide equivalent graspability.

Type I. Handrails with a circular cross-section shall have an outside diameter of at least 1.25 inches (32 mm) and not greater than 2 inches (51 mm) or shall provide equivalent graspability. If the handrail is not circular, it shall have a perimeter dimension of at least 4 inches (102 mm) and not greater than 6.25 inches (160 mm) with a maximum cross-section dimension of 2.25 inches (57 mm). Edges shall have a minimum radius of 0.01 inch (0.25 mm).

Exception: In Group R-3 occupancies; within dwelling units in Group R-2 occupancies; and in Group U occupancies that are accessory to a Group R-3 occupancy or accessory to individual dwelling units in Group R-2 occupancies; handrails shall be Type I, Type II as follows or shall provide equivalent graspability.

Type II. Handrails with a perimeter greater than 6.25 inches (160 mm) shall provide a graspable finger recess area on both sides of the profile. The finger recess shall begin within a distance of .75 inch (19 mm) measured vertically from the tallest portion of the profile and achieve a depth of at least .3125 inch (8 mm) within .875 inch (22 mm) below the widest portion of the profile. This required depth shall continue for at least .375 inch (10mm) to a level that is not less than 1.75 inches (45 mm) below the tallest portion of the profile. The minimum width of the handrail above the recess shall be 1.25 inches (32 mm) to a maximum of 2.75 inches (70 mm). Edges shall have a minimum radius of 0.01 inch (0.25 mm).

Reason: The purpose of the change is to add new requirements to the code. This proposal is offered only as an alternative to our other change to this section, which would allow a more comprehensive solution.

Other types of rail have been proven to be equivalent to, or better than those currently allowed. Although this proposal will allow the use of additional types of rails now restricted from the code. The Type II shape allows for the development of new ergonomic profiles that could exceed the properties of the limited handrail options now allowed in the IBC. Such options would not only permit the design of profiles for those with impairments, unable to close their hand to grasp small round objects, but also would allow greater flexibility to the designer that must respond to the aesthetic preferences of the consumer, thereby encouraging long-term and committed compliance with code regulations. Because this proposals scope is only for residential use these advantages would be severely compromised and only available to persons in the home environment.

The handrail shape description that is proposed for Type II handrails has been developed by independent researchers retained by the SMA to investigate graspability of handrails. Acting without specific mandate from SMA, these researchers developed and implemented tests, experiments, and analyses that revealed stairway fall kinematics, the forces that stairway users exert on handrails during falls, and the forces that persons in the general population can exert on handrails of various shapes.

Specifically, through a collaborative effort with researchers at the University of Toronto, the primary researchers – engineers with Simpson Gumpertz & Heger Inc. – conducted tests with human subjects to determine forces exerted on handrails. During these tests, test subjects stood on an activated stairway in postures and positions that represent those of a descending stairway user. Then, the stairway was induced to move forward and then suddenly stopped to cause the test subjects to lurch forward. By setting certain test parameters and through the introduction of barriers that prevented the test subjects from recovering, test subjects fell forward while attempting to arrest their fall by grabbing a handrail. During these tests, the researchers measured the forces exerted on the handrail and monitored the movements of the test subjects to understand fall kinematics.

To account for the broad variation in human stature, the researchers used a computer program, calibrated against the Toronto tests with live subjects, to extrapolate those test results to determine forces generated on handrails by persons representing the distribution within the population.

In a separate set of tests, the researchers investigated forces that persons can exert on handrails of various shapes. For these studies, the researchers developed test apparatus that allowed test subjects to grasp segments of handrails, which were then pulled by a motor out of the test subjects' grasp while forces were recorded. The test subjects were in a seated position (which represents a position that is similar to the posture that persons falling on stairways attain at the time they are exerting maximum arresting force on handrails), and forces were measured in three orthogonal directions: transverse, perpendicular upward, and longitudinal relative to the rail. Hundreds of tests were performed with dozens of test subjects ranging in age from sub-adolescent to elderly.

These tests, experiments, and analyses evaluated round handrails and a broad range of dimensions of handrails that are not round. With the results of these studies, the researchers conducted statistical analyses to determine the proportion of the population that would likely not be able to maintain a grasp on handrails of various shapes during a fall. Using this method, the researchers determined which shapes are graspable (meaning, at least as likely as round handrails to be secure handholds in actual fall scenarios). These statistical analyses showed that Type II handrails have graspability that is essentially equal to or greater than the graspability of handrails meeting the long-accepted and codified shape defined in this proposal as Type I (essentially round handrails, of common size).

The key feature of the graspability of Type II handrails is graspable finger recesses on both sides of the handrail. These recesses allow users to firmly grip a properly proportioned grasping surface on the top of the handrail, ensuring that the user can tightly retain a grip on the handrail for all forces that are associated with attempts to arrest a fall. In addition, Type II handrails have been shown to more than serve adequately for "guidance and support" as required by codes.

The research conducted by these independent researchers validates experience with handrails in service. Handrails meeting the Type II definition have been in service for perhaps hundreds of years without documentation that there is any deficiency in their functional characteristics. Indeed, some handrails conforming to the Type II definition perhaps are among the most common shapes presently used in the United States. Furthermore, by adopting the definition of Type II handrails in the IBC, we will be positively excluding from use a wide spectrum of handrail shapes that also are in common use, but do not meet the standard for graspability that has led to this proposal. With the adoption of this proposal, much of the uncertainty about what constitutes "equivalent graspability" will be removed, since a specific definition of acceptable alternative shapes will be introduced and codified.

The Type II definition has been expressly included in the IRC for five years. During that time, this shape definition has become a standard for determining the suitability of handrail shapes, even in jurisdictions that have not adopted the IRC. Furthermore, the SMA is aware of no documentation that suggests that inclusion of the Type II definition in the IRC has in any way diminished safety of handrails.

The adoption of the Type II shape allows the use of viable, lower-cost, safe handrails. Without allowing Type II shapes, we run the risk that economical and fully functional handrail designs (including those of wood, which require closely-spaced supports which potentially interfere with the grasping surface of round handrails) will be unreasonably excluded from use, to the detriment of the population which is entitled to cost-efficient construction when it has been demonstrated to be safe. Acceptance of the Type II shape would once again permit the use of low-cost, renewable-resource handrail shapes, all but eliminated as an option for the jurisdictions adopting the current IBC code.

The research and testing summarized above has been published and is available on the Internet as listed below in the bibliography. We believe that these landmark studies, sponsored by the SMA but performed by independent researchers, constitute the most thorough and legitimate research on handrail graspability performed anywhere in the world.

Bibliography:

[Dusenberry, D.O., Simpson, H., DelloRusso, S.J., and Rao, R.S., "Evaluation of Graspability of Handrails During Falls on Stairs," Presented at the Proceedings of the 13th Conference of Engineering Mechanics, Baltimore, MD, 13-16, June, 1999. <http://www.sqh.com/PDFs/Dusenberry.pdf>](http://www.sqh.com/PDFs/Dusenberry.pdf)

Maki, B.E. and Perry, S.D. (1996). "Influence of Handrail Design on Postural Stabilization: Pilot Phase." Report prepared for the Stairway Manufacturer's Association under contract to Simpson Gumpertz & Heger Inc., Arlington, MA. http://www.stairways.org/code_changes/Influence_HandrailDesign.pdf

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The proposal is limited to handrails along stairways within individual dwelling units in Group R-2 and R-3. Approval will allow for coordination with the IRC. The studies have proved that these handrails proposed as Type II would result in handrails which provide equivalent graspability to what is currently permitted in the code.

Assembly Action:

None

Final Hearing Results

E88-06/07

AS

Code Change No: E89-06/07

Original Proposal

Sections: 1012.4 (IFC [B] 1012.4)

Proponent: David W. Cooper, Stairway Manufacturers' Association

Revise as follows:

1012.4 Continuity. Handrail-gripping surfaces shall be continuous, without interruption by newel posts or other obstructions.

Exceptions:

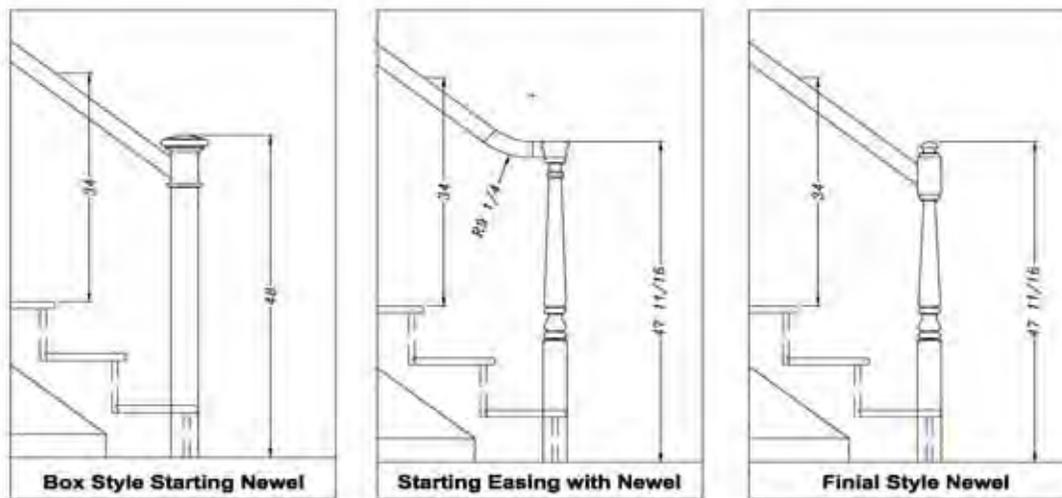
1. Handrails within dwelling units are permitted to be interrupted by a newel post at a turn stair landing.
2. Within a dwelling unit, the use of a volute, turnout, ~~or starting easing~~ or starting newel is allowed ~~on~~ over the lowest tread.
3. Handrail brackets or balusters attached to the bottom surface of the handrail that do not project horizontally beyond the sides of the handrail within 1.5 inches (38 mm) of the bottom of the handrail shall not be considered obstructions. For each 0.5 inch (12.7 mm) of additional handrail perimeter dimension above 4 inches (102 mm), the vertical clearance dimension of 1.5 inches (38 mm) shall be permitted to be reduced by 0.125 inch (3 mm).

Reason: The proposed change will make editorial corrections required as well as clarify the use of newels

The need to allow the use of a newel at intersections of the rail in dwelling units at a turn in the stair to provide for the use of newels within a flight has been recognized and allowed within the IRC and should be included in the IBC to allow lower cost options that have not caused any known attributable safety issues.

The use of a starting newel, like starting fittings, been a historically accepted practice in stairway construction and design. A starting newel installation presents no variance in the continuity of the handrail when compared to starting fittings and should be permitted. Please see attached graphic. As the user approaches the stair, if they use the handrail, the hand is extended more than the distance of one tread to grasp the rail. This is visually apparent in the wear marks on rails that extend beyond the nosing. The placement of the newel over the lowest step also allows for the post to be attached to the stair shortening the overall length of the stairway allowing more room to fit larger tread depths in the same space.

The editorial change in the preposition from “on” to “over” more clearly describes the position of the listed items to the lowest tread and has been used in the IRC with consistent interpretation.



FOR COMPARISON EACH OF THE ABOVE CONDITIONS ARE SHOWN ON THE SAME STAIR AT THE SAME RAIL HEIGHT

The above illustration shows little or no variation in continuity for the stairway user.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Modified

Modify the proposal as follows:

1012.4 Continuity. Handrail-gripping surfaces shall be continuous, without interruption by newel posts or other obstructions.

Exceptions:

1. Handrails within dwelling units are permitted to be interrupted by a newel post at a turn or stair landing.
2. Within a dwelling unit, the use of a volute, turnout starting easing or starting newel is allowed over the lowest tread.
3. Handrail brackets or balusters attached to the bottom surface of the handrail that do not project horizontally beyond the sides of the handrail within 1.5 inches (38 mm) of the bottom of the handrail shall not be considered obstructions. For each 0.5 inch (12.7 mm) of additional handrail perimeter dimension above 4 inches (102 mm), the vertical clearance dimension of 1.5 inches (38 mm) shall be permitted to be reduced by 0.125 inch (3 mm).

Committee Reason: The proposal will provide clarification for different stair configurations. The modification would allow for landings at L or U shaped stairways to have newel posts at the corners.

Assembly Action:

None

Final Hearing Results

E89-06/07

AM

Code Change No: **E90-06/07**

Original Proposal

Sections: 1012.4 (IFC [B] 1012.4)

Proponent: Bill Conner, Conner Associates LLC, representing himself

Revise as follows:

1012.4 Continuity. Handrail-gripping surfaces shall be continuous, without interruption by newel posts or other obstructions.

Exceptions:

1. Handrails within dwelling units are permitted to be interrupted by a newel post at a stair landing.
2. Within a dwelling unit, the use of a volute, turnout or starting easing is allowed on the lowest tread.
3. Handrail brackets or balusters attached to the bottom surface of the handrail that do not project horizontally beyond the sides of the handrail within 1.5 inches (38 mm) of the bottom of the handrail shall not be considered obstructions. For each 0.5 inch (12.7 mm) of additional handrail perimeter dimension above 4 inches (102 mm), the vertical clearance dimension of 1.5 inches (38 mm) shall be permitted to be reduced by 0.125 inch (3 mm).
4. Where handrails are provided along walking surfaces with slopes not steeper than 1:20, the bottoms of the handrail gripping surfaces shall be permitted to be obstructed along their entire length where they are integral to crash rails or bumper guards.

Reason: Sometime handrails are provided for patient use in nursing homes and hospitals along hallways. In these situations, it would not be practicable to require them to meet the gripping surface and still work as a bumper guard or handrail. While a patient may fall in a corridor, they do not have the same safety concern of continuing to fall, such as on a stairway, therefore, this compromise would not create a safety concern. The change is also for coordination with ADAAG and ICC A117.1 Section 505.6

Cost Impact: This code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: Handrails located along areas other than ramps and stairways are used differently. The new exception is useful for rails that serve as walking aids along hallways. The change would also coordinate with ICC A117.1.

Assembly Action:

None

Final Hearing Results

E90-06/07

AS

Code Change No: **E91-06/07**

Original Proposal

Sections: 1012.5 (New) [IFC [B] 1012.5 (New)]

Proponent: Bill Conner, Conner Associates LLC, representing himself

Add new text as follows:

1012.5 Fittings. Handrails shall not rotate within their fittings.

(Renumber subsequent sections)

Reason: This is an important safety concern that is not currently in the IBC requirements. This will also coordinate with ADAAG and ICC A117.1 Section 505.9.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: This proposal addresses a safety hazard commonly found in the field. This proposal will also coordinate with ICC A117.1.

Assembly Action:

None

Final Hearing Results

E91-06/07

AS

Code Change No: **E93-06/07**

Original Proposal

Sections: 1012.5 (IFC [B] 1012.5)

Proponent: Robert Bagnetto, Lapeyre Stair, Inc./Laitram Corp.

Revise as follows:

1012.5 Handrail extensions. Handrails shall return to a wall, guard or the walking surface or shall be continuous to the handrail of an adjacent stair flight. Where handrails are not continuous between flights the handrails shall extend horizontally at least 12 inches (305 mm) beyond the top riser and continue to slope for the depth of one tread beyond the bottom riser. At ramps where handrails are not continuous between runs, the handrail shall extend horizontally above the landing 12 inches (305 mm) minimum beyond the top and bottom ramps.

Exceptions:

1. Handrails within a dwelling unit that is not required to be accessible need extend only from the top riser to the bottom riser.
2. Aisle handrails in Group A occupancies in accordance with Section 1025.13.

3. Handrails for alternating tread devices may terminate at a location vertically above the top and bottom risers. Handrails for alternating tread devices are not required to be continuous between flights or to extend beyond the top or bottom risers.

Reason: The purpose of this proposed change is to remove the current requirements for handrail continuity between flights of alternating tread devices and to remove the requirements for handrail extensions at the top and bottom of non-continuous flights of alternating tread devices.

This proposal is superior to the current provisions of the code in that it removes overly restrictive requirements for handrails of alternating tread devices. The current required handrail extension of alternating tread devices of 12 inches horizontally beyond the top riser and the slope of one tread depth beyond the bottom riser, as well as the requirement for handrail continuity between adjacent flights is based on the requirements for handrails of traditional type stairs. The alternating tread device handrail extension and continuity requirements appear to have been chosen arbitrarily, assuming that the handrail requirements best suited for traditional type stairs would also be best for alternating tread devices. However, considering alternating tread devices are typically used as a safer alternative to a ladder, typically used in tight spaces where traditional type stairs cannot be used, have stair angles much steeper than traditional type stairs, and have different usage than traditional type stairs, removal of the existing extension and continuity requirements is appropriate.

Alternating tread devices have been used for approximately 25 years without handrail extensions or continuous handrails been flights. Lapeyre Stair is not aware of any cases where these handrail features has been a problem for users of alternating tread devices. Alternating tread device handrails without extensions or continuity between flights have proved to provide adequate gripping length to allow the user to safely reach the top or bottom landing. Prior to release of the alternating tread device, Lapeyre Stair performed informal testing to verify the acceptability of this handrail configuration. Additionally, a scientific stud titled "Performance, perceived safety and comfort of the alternating tread stair" was performed that demonstrated the satisfactory use of alternating tread devices. The handrail extension and continuity requirements for alternating tread devices appears to have first been introduced in sections 1003.3.3.10.1, and 1003.3.3.11.5 of IBC-2000 and then carried forward to sections 1009.10.1 and 1009.11.5 of IBC-2003. The precursor codes to IBC appear not to discuss alternating tread device handrail extensions or continuity or to allow whatever handrail configuration provides safe use of the device. (Ref: BOCA-1999 Sections 1014.6.6.1 and 1022.2.5, SBC-1999 Section 1007.8.4 and 1007.8.5; UBC Section 1003.3.3.1). Finally, in an IBC code interpretation letter dated July 23, 2004 to Fanning/Howley Associates Inc, indicates that the current handrail extension requirements in the IBC may not be appropriate for alternating treads, and of alternative approval for an alternating tread device without handrail extensions may be acceptable. The elimination of extension and continuity requirements of handrails for alternating tread devices does not substantially alter the design of alternating tread devices, and actually results is less occupied space which could minimally lower costs.

Bibliography:

The BOCA National Building Code/1999 sections 1014.6.6.1 & 1022.2.5

Standard Building Code 1999 Edition sections 1007.8.4 & 1007.8.5

1997 Uniform Building Code section 1003.3.3.1 (exception)

Performance, perceived safety and comfort of the alternating tread stair by Jorna, Mohageg & Synder Virginia Polytechnic Institute and State University, published Applied Ergonomics 1989.20.1,26-32

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The unique configuration of alternating tread devices makes an exception for the handrail extensions reasonable.

Assembly Action:

None

Final Hearing Results

E93-06/07

AS

Code Change No: E99-06/07

Original Proposal

Sections: 1013.2 (IFC [B] 1013.2)

Proponent: Robert Bagnetto, Lapeyre Stair, Inc./Laitram Corp.

Revise as follows:

1013.2 Height. Guards shall form a protective barrier not less than 42 inches (1067 mm) high, measured vertically above the leading edge of the tread, adjacent walking surface or adjacent seatboard.

Exceptions:

1. For occupancies in Group R-3, and within individual dwelling units in occupancies in Group R-2, guards whose top rail also serves as a handrail shall have a height not less than 34 inches (864 mm) and not more than 38 inches (1067 mm) measured vertically from the leading edge of the stair tread nosing.
2. The height in assembly seating areas shall be in accordance with section 1024.14.
3. Along alternating tread device, guards whose top rail also serves as a handrail, shall have height not less than 30 inches (762 mm) and not more than 34 inches (864 mm), measured vertically from the leading edge of the device tread nosing.

Reason: The purpose of this proposed change is to replace the current guardrail height requirements for alternating tread devices, which are inappropriately based on the guardrail height requirements for traditional type stairs, with new guardrail height requirements more appropriate to alternating tread devices. This change also allows the top rail of a guardrail to also be used as a handrail.

This proposal is superior to the current provisions of the code in that it rectifies shortcomings in the existing code for alternating tread device guard requirements. The current required guardrail height of alternating tread devices of 42 inches is based on the required guardrail height of traditional type stairs which have a stair angles much lower than alternating tread devices. This alternating tread device guardrail height appears to have been chosen arbitrarily, assuming that the guardrail height best suited for traditional type stairs would also be best for alternating tread devices. Although they have treads as a traditional stair does, alternating tread devices have considerable different characteristics (the most important being a much steeper angle) from a traditional stair and thus the requirements for the features for an alternating tread device often must differ from a traditional stair. Considering that the steeper angle of alternating tread devices and that the rails are often used under the arms for stabilization, a lower guardrail height of 30 inches to 34 inches is more appropriate and the existence of a separate handrail and guardrail is unnecessary for alternating tread devices.

Alternating tread devices have been used for approximately 25 years with a single rail, with a height (measured vertically from the tread nosings to the top of the rail) of approximately 32 inches, acting both as a guardrail and a handrail. Lapeyre Stair is not aware of any cases where this rail height has been a problem for users of alternating tread devices. Prior to release of the alternating tread device, Lapeyre Stair performed informal testing to verify that this is the optimal rail height. Additionally, a scientific stud titled "Performance, perceived safety and comfort of the alternating tread stair" was performed that demonstrated the satisfactory use of alternating tread devices. The 42 inch guardrail height requirement for alternating tread devices appears to have first been introduced in sections 1003.2.12 and 1003.2.12.1 of IBC-2000 and then carried forward to Section 1012.1 and 1012.2 of IBC-2003. The precursor codes to IBC are unclear or appear not to discuss alternating tread device guardrail height at all. (Ref: BOCA-1999 Sections 1014.6.6.1, 1021.2, 1022.2.2 and 1022.2.5, SBC-1999 Sections 1007.5, 1007.8.4 and 1007.8.5, 1015.1; UBC Section 1003.3.3.1, 1003.3.3.7, 509.1 and 509.2). Furthermore, there does not appear to be any documented scientific testing to verify that the current guardrail heights in IBC for alternating tread devices are the most appropriate. Finally, an IBC code interpretation letter dated July 23, 2004 to Fanning/Howley Associates Inc, indicated that the current rail height in the IBC may not be appropriate, and alternative approval of an alternating tread device with a rail configuration inconsistent with IBC, Section 1013.2 may be appropriate. The lower guardrail height and allowing a single rail to act as both a guardrail and a handrail for alternating tread devices does not substantially alter the design of alternating tread devices, and actually results in less construction cost and less occupied space which could minimally lower costs.

Bibliography:

The BOCA National Building Code/1999 Sections 1014.6.6.1, 1021.2, 1022.2.2 and 1022.2.5
Standard Building Code 1999 Edition Sections 1007.5, 1007.8.4 and 1007.8.5, 1015.1
1997 Uniform Building Code Section 1003.3.3.1 (exception), 1003.3.3.7, 509.1 and 509.2
Performance, perceived safety and comfort of the alternating tread stair by Jorna, Mohageg & Synder Virginia Polytechnic Institute and State University, published Applied Ergonomics 1989.20.1,26-32

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The locations of where alternating tread devices are permitted is limited, therefore a lower guard height is appropriate.

Assembly Action:

None

Final Hearing Results

E99-06/07

AS

Code Change No: E100-06/07

Original Proposal

Sections: 1013.3 (IFC [B] 1013.3)

Proponent: Robert Bagnetto, Lapeyre Stair, Inc./Laitram Corp.

Revise as follows:

1013.3 Opening limitations. Open guards shall have balusters or ornamental patterns such that a 4-inch-diameter (102 mm) sphere cannot pass through any opening up to a height of 34 inches (864 mm). From a height of 34 inches (864 mm) to 42 inches (1067 mm) above the adjacent walking surfaces, a sphere 8 inches (203 mm) in diameter shall not pass.

Exceptions:

1. The triangular openings formed by the riser, tread and bottom rail at the open side of a stairway shall be of a maximum size such that a sphere of 6 inches (152 mm) in diameter cannot pass through the opening.
2. At elevated walking surfaces for access to and use of electrical, mechanical or plumbing systems or equipment, guards shall have balusters or be of solid materials such that a sphere with a diameter of 21 inches (533 mm) cannot pass through any opening.
3. In areas that are not open to the public within occupancies in Group I-3, F, H or S, and for alternating tread devices, balusters, horizontal intermediate rails or other construction shall not permit a sphere with a diameter of 21 inches (533 mm) to pass through any opening.
4. In assembly seating areas, guards at the end of aisles where they terminate at a fascia of boxes, balconies and galleries shall have balusters or ornamental patterns such that a 4-inch-diameter (102 mm) sphere cannot pass through any opening up to a height of 26 inches (660 mm). From a height of 26 inches (660 mm) to 42 inches (1067 mm) above the adjacent walking surfaces, a sphere 8 inches (203 mm) in diameter shall not pass.
5. Within individual dwelling units and sleeping units in Group R-2 and R-3 occupancies, openings for required guards on the sides of stair treads shall not allow a sphere of 4.375 inches (111 mm) to pass through.

Reason: The purpose of this proposed change is to replace the current requirements for guard openings for alternating tread devices, which are inappropriately based on the requirements for guard openings for traditional type stairs, with new requirements for guard openings more appropriate to alternating tread devices.

This proposal is superior to the current provisions of the code in that it rectifies shortcomings in the existing code for requirements of, and provides clarification for, guard openings on alternating tread devices. The current requirements for guard openings of alternating tread devices are identical to the required guard openings of traditional type stairs. IBC currently requires open guards on stairs to have baluster or ornamental patterns such that a 4 inch diameter sphere cannot pass through (with exceptions above 34 inches and between the tread, riser and bottom rail). IBC provides an exception which allows guard openings such that a 21 inch diameter sphere cannot pass through for guards in areas not open to the public within occupancies in Group I-3, F, H or S. Requirements for guard openings on alternating tread devices appears to have not been addressed in the code, and by lack of any other requirements default to the requirements for traditional type stairs. Alternating tread devices are not limited to uses within the occupancies in Group I-3, F, H or S. In addition to use in the areas of these occupancies, alternating tread devices can be used for access to a.) unoccupied roofs (1009.11), b.) boiler, a incinerator and furnace rooms (1015.3) c.) refrigeration machinery rooms (1015.4) and d.) catwalks, gridirons and galleries used for stages (1015.6.1). None of the uses allowed in IBC for alternating tread devices are of the type such that the device would require guards with openings such that a 4 inch diameter sphere could not pass through. Guard requirements for alternating tread devices in uses than other Group I-3, F, H or S would therefore be unnecessarily restrictive by not allowing guard openings such that a 21 inch diameter sphere could not pass through.

Alternating tread devices have been used for approximately 25 years without guards having openings such that a 4 inch sphere cannot pass through. Lapeyre Stair is not aware of any cases where the guards have been a problem for users of alternating tread devices. Alternating tread devices are typically not used in locations where the 4 inch sphere rule would apply (i.e. where small children would use the device, etc.). The guardrail opening requirement for alternating tread devices appears to have first been introduced in section 1003.2.12.2 of IBC-2000 and then carried forward to section 1012.3 of IBC-2003. The precursor codes to IBC are unclear or appear not to discuss alternating tread device guardrail openings. (ref: BOCA-1999 Sections 1014.6.6, 1021.3 and 1022.2.5, SBC-1999 Sections 1007.8.4 and 1007.8.5, 1015.3; UBC Section 1003.3.3.1, 1003.3.3.7 and 509.3). Finally, in an IBC code interpretation letter dated July 23, 2004 to Fanning/Howley Associates Inc, indicated that rail requirements in the IBC may not be appropriate for alternating tread devices, and alternate approval of an alternating tread device with a rail configuration inconsistent with IBC, Section 1013.3 may be acceptable. Allowing a 21 inch guard opening in alternating tread devices does not substantially alter their design of, and actually results in less construction cost.

Bibliography:

The BOCA National Building Code/1999 sections 1014.6.6, 1021.3, and 1022.2.5
 Standard Building Code 1999 Edition sections 1007.8.4 and 1007.8.5, 1015.3
 1997 Uniform Building Code section 1003.3.3.1 (exception), 1003.3.3.7 and 509.3

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The locations of where alternating tread devices are permitted is limited, therefore a large guard opening is appropriate. This would be consistent with the committee action on E99-06/07.

Assembly Action:

None

Final Hearing Results

E100-06/07

AS

Code Change No: E104-06/07

Original Proposal

Sections: 1014.2.2 (IFC [B] 1014.2.2)

Proponent: John Williams, Construction Review Services, Washington State Department of Health

Revise as follows:

1014.2.2 Group I-2. Habitable rooms or suites in Group I-2 occupancies shall have an exit access door leading directly to a corridor.

Exceptions:

1. Rooms with exit doors opening directly to the outside at ground level.
2. Patient sleeping rooms are permitted to have one intervening room if the intervening room is not used as an exit access for more than eight patient beds.
3. Special nursing suites are permitted to have one intervening room where the arrangement allows for direct and constant visual supervision by nursing personnel.
4. For rooms other than patient sleeping rooms located within a suite, exit access travel from within the suite shall be permitted through one intervening room where the travel distance to the exit access door is not greater than 100 feet (30 480 mm).
5. For rooms other than patient sleeping rooms located within a suite, exit access travel from within the suite shall be permitted through two intervening rooms where the travel distance to the exit access door is not greater than 50 feet (15 240 mm).

Suites of sleeping rooms shall not exceed 5,000 square feet (465 m²). Suites of rooms other than patient sleeping rooms shall not exceed 10,000 square feet (929 m²). Any patient sleeping room, or any suite that includes patient sleeping rooms, of more than 1,000 square feet (93 m²) shall have at least two exit access doors remotely located from each other. Any room or suite of rooms other than patient sleeping rooms of more than 2,500 square feet (232 m²) shall have at least two exit access doors remotely located from each other. The travel distance between any point in a Group I-2 occupancy and an exit access door in the room shall not exceed 50 feet (15 240 mm). The travel distance between any point in a suite of sleeping rooms and an exit access door of that suite shall not exceed 100 feet (30 480 mm).

Reason: The purpose of the proposed change is to clarify the required access to exits provided in a non sleeping suite of patient rooms. The term "access door" is not consistent with similar requirements in this section. This change would mend an omission to the original text. The charging statement of this code refers to an "exit access door". All other requirements in this section that relate to size of suites and access to exits use the term "exit access door".

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The proposal will provide consistency in the code for the use of the term ~~exit access~~.

Assembly Action:

None

Final Hearing Results

E104-06/07

AS

Code Change No: E105-06/07

Original Proposal

Sections: 1014.2.2, 1014.2.3 through 1014.2.5 (New) [IFC [B] 1014.2.2, [B] 1014.2.3 through [B] 1014.2.5 (New)]

Proponent: John Williams, Construction Review Services, Washington State Department of Health

Delete and substitute as follows:

1014.2.2 Group I-2. Habitable rooms or suites in Group I-2 occupancies shall have an exit access door leading directly to a corridor.

Exceptions:

1. Rooms with exit doors opening directly to the outside at ground level.
2. ~~Patient sleeping rooms are permitted to have one intervening room if the intervening room is not used as an exit access for more than eight patient beds.~~
3. ~~Special nursing suites are permitted to have one intervening room where the arrangement allows for direct and constant visual supervision by nursing personnel.~~
4. ~~For rooms other than patient sleeping rooms located within a suite, exit access travel from within the suite shall be permitted through one intervening room where the travel distance to the exit access door is not greater than 100 feet (30 480 mm).~~
5. ~~For rooms other than patient sleeping rooms located within a suite, exit access travel from within the suite shall be permitted through two intervening rooms where the travel distance to the exit access door is not greater than 50 feet (15 240 mm).~~

~~Suites of sleeping rooms shall not exceed 5,000 square feet (465 m²). Suites of rooms other than patient sleeping rooms shall not exceed 10,000 square feet (929 m²). Any patient sleeping room, or any suite that includes patient sleeping rooms, of more than 1,000 square feet (93 m²) shall have at least two exit access doors remotely located from each other. Any room or suite of rooms other than patient sleeping rooms of more than 2,500 square feet (232 m²) shall have at least two access doors remotely located from each other. The travel distance between any point in a Group I-2 occupancy and an exit access door in the room shall not exceed 50 feet (15 240 mm). The travel distance between any point in a suite of sleeping rooms and an exit access door of that suite shall not exceed 100 feet (30 480 mm).~~

1014.2.3 Suites in patient sleeping areas. Patient sleeping areas in Group I-2 Occupancies shall be permitted to be divided into suites if one of the following conditions is met:

1. The intervening room within the suite is not used as an exit access for more than eight patient beds.
2. The arrangement of the suite allows for direct and constant visual supervision by nursing personnel.

1014.2.3.1 Area. Suites of sleeping rooms shall not exceed 5,000 square feet (465 m²).

1014.2.3.2 Exit access. Any patient sleeping room, or any suite that includes patient sleeping rooms, of more than 1,000 square feet (93m²) shall have at least two exit access doors remotely located from each other.

1014.2.3.3 Travel distance. The travel distance between any point in a suite of sleeping rooms and an exit access door of that suite shall not exceed 100 feet (30 480 mm).

1014.2.4 Suites in areas other than patient sleeping areas. Areas other than patient sleeping areas in Group I-2 Occupancies shall be permitted to be divided into suites.

1014.2.4.1 Area. Suites of rooms, other than patient sleeping rooms, shall not exceed 10,000 square feet (929 m²).

1014.2.4.2 Exit access. Any room or suite of rooms, other than patient sleeping rooms, of more than 2,500 square feet (232 m²) shall have at least two access doors remotely located from each other.

1014.2.4.3 One intervening room. For rooms other than patient sleeping rooms, suites of rooms are permitted to have one intervening room if the travel distance within the suite to the exit access door is not greater than 100 feet (30480mm).

1014.2.4.4 Two intervening rooms. For rooms other than patient sleeping rooms located within a suite, exit access travel from within the suite shall be permitted through two intervening rooms where the travel distance to the exit access door is not greater than 50 feet (15 240 mm).

1014.2.5 Travel distance. The travel distance between any point in a Group I-2 occupancy room and an exit access door in that room shall not exceed 50 feet (15 240 mm).

Reason: This amendment serves to clarify the existing language to help designers and code enforcement personnel understand the current requirements.

The existing text is covers two main concepts:

- Suites that contain patient sleeping areas; and,
- Suites that do not contain patient sleeping areas.

The requirements for each of these concepts are different, but they are not arranged consecutively. The proposed change clarifies the language by grouping the requirements for these two primary concepts into consecutive sections of code.

Exception 1, 2 and 3 moved. The benefit of allowing the use of suites is the ability to have intervening rooms. These two exceptions provide the only instances where intervening room is acceptable for patient sleeping areas. Therefore, they also define the only acceptable conditions for a sleeping suite. These exceptions are reworded and moved to the "sleeping suite" area (1014.2.3.x) of the proposed code.

Exception 4 and 5 moved. These exceptions deal with non sleeping suites and have been moved to the "non sleeping suite" area (1014.2.4.x) of the proposed code.

There are no intended changes to the actual requirements. This proposal is intended to rearrange and put logical breaks into a long and confusing section of code.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The proposal provides a logical order for the separation of different types of suites found in hospitals and will help clarify requirements for means of egress.

Assembly Action:

None

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because public comments were submitted.

Public Comment 1:

John Williams, Washington State Department of Health – Construction Review Services, requests Approval as Modified by this public comment.

Modify proposal as follows:

1014.2.3 Suites in patient sleeping areas. Patient sleeping areas in Group I-2 Occupancies shall be permitted to be divided into suites with one intervening room if one of the following conditions is met:

1. The intervening room within the suite is not used as an exit access for more than eight patient beds.
2. The arrangement of the suite allows for direct and constant visual supervision by nursing personnel.

(Portions of the proposal not shown remain unchanged)

Commenter's Reason: This modification clarifies that suites in patient sleeping areas are allowed only one intervening room between the patient sleeping areas and an exit access corridor. As written, the restriction to one intervening room is too vague and would cause confusion. This change is consistent with the federal requirements for Medicare certification.

Public Comment 2:

John Williams Washington State Department of Health – Construction Review Services, requests Approval as Modified by this public comment.

Modify proposal as follows:

1014.2.5 Travel distance. The travel distance between any point in a Group I-2 Occupancy patient sleeping room and an exit access door in that room shall not exceed 50 feet (15,240 mm).

(Portions of proposal not shown remain unchanged)

Commenter's Reason: The slowest evacuation rate in an I-2 occupancy is in patient sleeping areas, due to the equipment and support functions that must be moved with the patient when they are evacuated. Other common accessory uses in a hospital; such as supply rooms, dining rooms, gyms; do not have this complication. This change is consistent with the federal requirements for Medicare certification.

Final Hearing Results

E105-06/07

AMPC 1, 2

Code Change No: E106-06/07

Original Proposal

Sections: 1014.2.3 (New) [IFC [B] 1014.2.3 (New)]

Proponent: John Williams, Construction Review Services, Washington State Department of Health

Add new text as follows:

1014.2.3 Separation. Suites in Group I-2 occupancies shall be separated from other portions of the building by a smoke partition complying with Section 710.

Reason: The purpose of the proposed change is to clarify the walls that define an I-2 suite. Nowhere in the current code does it explain how the wall surrounding the suite should be constructed. The additional reference would help code officials determine how these suites should be designed.

The existing requirement listed in 1014 is that an I-2 occupant is able to travel directly from a room into a corridor or through a suite into a corridor. In either case, the occupant passes through a smoke partition (corridor wall) by entering the corridor. The occupancies are often designed with suites being placed directly adjacent to each other. The code also states that the sizes of suites should be limited. It appears that the intent of code is to create separate atmospheres of a certain size that are constructed limit the transfer of smoke.

Cost Impact: The code change proposal will not increase the cost of construction. Smoke partitions create an atmospheric separation only and do not require dampers in most cases.

Analysis: Requirements for smoke barriers in Group I-2 is located in Section 407.4.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The proposal addresses a common question regarding separation of areas within hospitals. This is a good clarification.

Assembly Action:

None

Final Hearing Results

E106-06/07

AS

Code Change No: **E107-06/07**

Original Proposal

Sections: 1014.3 (IFC [B] 1014.3)

Proponent: Ron Nickson, National Multi Housing Council/National Apartment Association

Revise as follows:

1014.3 Common path of egress travel. In occupancies other than Groups H-1, H-2 and H-3, the common path of egress travel shall not exceed 75 feet (22 860 mm). In Group H-1, H-2 and H-3 occupancies, the common path of egress travel shall not exceed 25 feet (7620 mm). For common path of egress travel in Group A occupancies having fixed seating, see Section 1025.8.

Exceptions:

1. The length of a common path of egress travel in Group B, F and S occupancies shall not be more than 100 feet (30 480 mm), provided that the building is equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1.
2. Where a tenant space in Group B, S and U occupancies has an occupant load of not more than 30, the length of a common path of egress travel shall not be more than 100 feet (30 480 mm).
3. The length of a common path of egress travel in a Group I-3 occupancy shall not be more than 100 feet (30 480 mm).
4. The length of a common path of egress travel in a Group R-2 occupancy shall not be more than 125 feet (38 100 mm), provided that the building is protected throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2.

Reason: To increase the allowable common path of travel in R-2 occupancies from 75 feet to 125 feet when the R-2 occupancy is protected with a NFPA 13R sprinkler system. The design requirements and thus the protection provided with NFPA 13R system in the area being protected are the same as that provide with a NFPA 13 system. The 98% operational effectiveness of residential sprinkler systems is the best of all occupancy classifications.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The proposal does not increase the overall travel distance, but increases the common path of travel only. The trade off is appropriate for a NFPA 13R system. The trade off will provide incentive for providing sprinkler systems and will provide adequate protection for the areas addressed in this change as far as the common path of travel. The proposals for E107 and E108 are the same.

Assembly Action:

None

Final Hearing Results

E107-06/07

AS

Code Change No: E108-06/07

Original Proposal

Sections: 1014.3 (IFC [B] 1014.3)**Proponent:** Richard B. Alpert, P.E., Schirmer Engineering Corporation**Revise as follows:**

1014.3 Common path of egress travel. In occupancies other than Groups H-1, H-2 and H-3, the common path of egress travel shall not exceed 75 feet (22 860 mm). In occupancies in Groups H-1, H-2, and H-3, the common path of egress travel shall not exceed 25 feet (7620 mm). For common path of egress travel in Group A occupancies having fixed seating, see Section 1025.8.

Exceptions:

1. The length of a common path of egress travel in an occupancy in Groups B, F and S shall not be more than 100 feet (30 480 mm), provided that the building is equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1.
2. Where a tenant space in an occupancy in Groups B, S and U has an occupant load of not more than 30, the length of a common path of egress travel shall not be more than 100 feet (30 480 mm).
3. The length of a common path of egress travel in occupancies in Group I-3 shall not be more than 100 feet (30 480 mm).
4. The length of a common path of egress travel in a Group R-2 occupancy shall not be more than 125 feet (38 100 mm), provided that the building is protected throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2.

Reason: The purpose of the code change is to revise the code to allow exception provision for sprinkler systems installed in accordance with NFPA 13R. Exception 4 to Section 1014.3, "Common path of egress travel" allows the extension of the common path of travel in R-2 occupancies from 75 feet to 125 feet for buildings protected throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.1 of the code. This allows the exception provision for sprinkler systems installed in accordance with NFPA 13. The code is overly restrictive in that it does not allow the exception provision for building protected throughout with an approved automatic sprinkler system installed in accordance with Section 903.3.1.2 of the code which would allow the exception provision for sprinkler systems installed in accordance with NFPA 13R.

Substantiation: Exception 4 to Section 1014.3, "Common path of egress travel" allows the extension of the common path of travel in R-2 occupancies from 75 feet to 125 feet for buildings protected throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.1 of the code. R-2 occupancies are defined in the code as "residential occupancies containing sleeping units or more than two dwelling units where the occupants are primarily permanent in nature". NFPA 13R is the standard for the installation of sprinklers in residential occupancies up to and including four stories in height. As stated in the administrative section of the handbook to this standard "the Technical Committee on Residential Sprinkler Systems intends that NFPA 13R provides an acceptable level of fire protection with respect to life safety and property protection". Per the title and scope of NFPA 13R, R-2 occupancies greater than four stories would be required follow the requirements of NFPA 13 for the installation of automatic sprinkler systems.

The increase in the common path of egress is for the portion of egress travel within the dwelling unit, once outside of the dwelling unit and in the exit access corridor two paths of travel are available to the occupants as shown in Figure 1014.3 of the 2006 IBC Commentary. In addition to the protection provided by the automatic sprinkler systems the dwelling units of an R-2 occupancy are required to be separated from each other by a minimum of a 1-hour fire resistive construction per Section 708.1 of the IBC, and from the exit access corridor by a minimum of a ½ hour fire resistive construction per Section 1017.1 of the IBC.

As stated in the commentary for the 2006 IBC Section 1015.2.1, Exception 2, "The protection provided by an automatic sprinkler system installed in accordance with either NFPA 13 or NFPA 13R can reduce the threat of fire buildup so that the reduction in remoteness is not unreasonable, based on the presumption that it provides the occupants with an acceptable level of safety from fire". This same reasoning in the protection provided by an automatic sprinkler system is applicable to an increase in the common path of travel. This revision to allow the exception provision for automatic sprinkler systems installed in accordance with NFPA 13R would be consistent with the provisions of Exception 2 to Section 1015.2.1 of the code which allows the exception for the reduction of the required exit doors or exit access doorways separation distance "where a building is equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2".

Bibliography:

NFPA 13, "Standard for the Installation of Sprinkler Systems", 2002 Edition, National Fire Protection Association, Quincy, MA.
NFPA 13R, "Standard for the Installation of Sprinkler Systems in Residential Occupancies up to and Including Four Stories in Height", 2002 Edition, National Fire Protection Association, Quincy, MA.
Automatic Sprinkler Systems Handbook, 2002, National Fire Protection Association, Quincy, MA

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The proposal does not increase the overall travel distance, but increases the common path of travel only. The trade off is appropriate for a NFPA 13R system. The trade off will provide incentive for providing sprinkler systems and will provide adequate protection for the areas addressed in this change as far as the common path of travel. The proposals for E107 and E108 are the same.

Assembly Action:

None

Final Hearing Results

E108-06/07

AS

Code Change No: E110-06/07

Original Proposal

Sections: 1014.4 (IFC [B] 1014.4)

Proponent: Jay Hall, Virginia Department of Housing & Community Development, representing Virginia Building and Code Officials Association

Revise as follows:

1014.4 Aisles. Aisles serving as a portion of the exit access in the means of egress system shall comply with the requirements of this section. Aisles shall be provided from all occupied portions of the exit access which contain seats, tables, furnishings, displays and similar fixtures or equipment. Aisles serving assembly areas, ~~other than seating at tables~~, shall comply with Section 1025. Aisles serving reviewing stands, grandstands and bleachers shall also comply with Section 1025. The required width of aisles shall be unobstructed.

Reason: Aisle and aisle accessway are defined terms in the IBC and IFC. Section 1014.4.2.1 and 1014.4.2.2 provide requirements for aisle accessway widths only. Section 1014.4 requires the user to obtain width requirements on aisles serving seating at tables from this section. This section does not provide width requirements for aisles serving seating at tables. The proposed language sends the user to section 1025, specifically 1025.9.1 to obtain minimum aisle widths serving seating at tables.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The proposal provides necessary direction for the different requirements for the width of aisles and aisle accessways.

Assembly Action:

None

Final Hearing Results

E110-06/07

AS

Code Change No: E111-06/07

Original Proposal

Sections: 1002.1, 1014.4 through 1014.5.2 (IFC [B] 1002.1, [B] 1014.4 through [B] 1014.5.2)

Proponent: Gregory R. Keith, Professional heuristic Development, representing The Boeing Company

Revise as follows:

1002.1 Definitions. The following words and terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

AISLE. An unenclosed exit access component that defines and provides a path of egress travel to a corridor or to an exit.

SECTION 1017 AISLES

4014.4 1017.1 Aisles General. Aisles serving as a portion of the exit access in the means of egress system shall comply with the requirements of this section. Aisles shall be provided form all occupied portions of the exit access which contain seats, tables, furnishings, displays and similar fixtures or equipment. Aisles serving assembly areas, other than seating at tables, shall comply with Section 1025. Aisles serving reviewing stands, grandstands and bleachers shall also comply with Section 1025.

The required width of aisles shall be unobstructed.

Exception: Doors, when fully opened, and handrails shall not reduce the required width by more than 7 inches (178 mm). Doors in any position shall not reduce the required width by more than one-half. Other nonstructural projections such as trim and similar decorative features are permitted to project into the required width 1.5 inches (38 mm) from each side.

4014.4.1 1017.2 Aisles in Groups B and M. In Group B and M occupancies, the minimum clear aisle width shall be determined by Section 1005.1 for the occupant load served, but shall not be less than 36 inches (914 mm).

Exception: Nonpublic aisles serving less than 50 people and not required to be accessible by Chapter 11 need not exceed 28 inches (711 mm) in width.

4014.4.2 1017.3 Aisle accessways in Group M. An aisle accessway shall be provided on at least one side of each element within the merchandise pad. The minimum clear width for an aisle accessway not required to be accessible shall be 30 inches (762 mm). The required clear width of the aisle accessway shall be measured perpendicular to the elements and merchandise within the merchandise pad. The 30-inch (762 mm) minimum clear width shall be maintained to provide a path to an adjacent aisle or aisle accessway. The common path of travel shall not exceed 30 feet (9144 mm) from any point in the merchandise pad.

Exception: For areas serving not more than 50 occupants, the common path of travel shall not exceed 75 feet (22 880 mm).

4014.4.3 1017.4 Seating at tables. Where seating is located at a table or counter and is adjacent to an aisle or aisle accessway, the measurement of required clear width of the aisle or aisle accessway shall be made to a line 19 inches (483 mm) away from and parallel to the edge of the table or counter. The 19-inch (483 mm) distance shall be measured perpendicular to the side of the table or counter. In the case of other side boundaries for aisle or aisle accessways, the clear width shall be measured to walls, edges of seating and tread edges, except that handrail projections are permitted.

Exception: Where tables or counters are served by fixed seats, the width of the aisle accessway shall be measured from the back of the seat.

1014.4.3.1 1017.4.1 Aisle accessway for tables and seating. Aisle accessways serving arrangements of seating at tables or counters shall have sufficient clear width to conform to the capacity requirements of Section 1005.1 but shall not have less than the appropriate minimum clear width specified in Section 1014.4.3.2.

1014.4.3.2 1017.4.2 Table and seating accessway width. Aisle accessways shall provide a minimum of 12 inches (305 mm) of width plus 0.5 inch (12.7 mm) of width for each additional 1 foot (305 mm), or fraction thereof, beyond 12 feet (3658 mm) of aisle accessway length measured from the center of the seat farthest from an aisle.

Exception: Portions of an aisle accessway having a length not exceeding 6 feet (1829 mm) and used by a total of not more than four persons.

1014.4.3.3 1017.4.3 Table and seating aisle accessway length. The length of travel along the aisle accessway shall not exceed 30 feet (9144 mm) from any seat to the point where a person has a choice of two or more paths of egress travel to separate exits.

SECTION 1019 EGRESS BALCONIES

1014.5 1019.1 Egress balconies General. Balconies used for egress purposes shall conform to the same requirements as corridors for width, headroom, dead ends and projections.

1014.5.1 1019.2 Wall separation. Exterior egress balconies shall be separated from the interior of the building by walls and opening protectives as required for corridors.

Exception: Separation is not required where the exterior egress balcony is served by at least two stairs and a dead-end travel condition does not require travel past an unprotected opening to reach a stair.

1014.5.2 1019.3 Openness. The long side of an egress balcony shall be at least 50 percent open, and the open area above the guards shall be so distributed as to minimize the accumulation of smoke or toxic gases.

Reason: A definition of aisle was introduced into the 2006 IBC. Unfortunately, a corridor, by definition, also meets the present definition of an aisle. The proposed modifications to the definition of aisle are based on the root definition of corridor as an exit access component. Inasmuch as there are only two interior exit access means of egress components and a corridor is defined as "an enclosed exit access component," an aisle must be an unenclosed exit access component. The definition of corridor also prescribes the extent of egress travel within that component. Similar language has been added to the definition of aisle. It is felt that more comprehensive definitions will assist code users in the proper design and analysis of means of egress systems

Additionally, since aisles and exterior egress balconies are formal exit access components, it is felt that they should enjoy full section status similar to many other means of egress components. This will help users quickly and efficiently access necessary provisions. The reorganization of means of egress provisions in the 2003 IBC created several illogical locations for technical provisions. This provision will help correct that situation.

Approval of this proposal will clarify current code provisions and assist users in the proper determination of means of egress requirements.

Approval of this proposal will greatly assist design professionals and code enforcement officials in the proper application of these fundamental and essential *International Building Code* provisions, especially those with minimal experience.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: If approved, the following editorial changes will occur. The proposed Section 1017, Aisles, would occur between current Section 1016, Exit Access Travel Distance, and Section 1017, Corridors. The proposed Section 1019, Egress Balconies, would occur between current Section 1017, Corridors, and Section 1018, Exits. Sections and references would be renumbered accordingly.

Public Hearing Results

Committee Action:

Approved as Modified

Modify the proposal as follows:

AISLE. An unenclosed exit access component that defines and provides a path of egress travel ~~to a corridor or to an exit.~~

(Portions of proposal not shown remain unchanged)

Committee Reason: The proposal will provide a more easily understood format for the requirements for aisles and egress balconies.

A modification was made to the definition for ~~aisles~~ to delete the words ~~to a corridor or to an exit.~~ Since an aisle could extend to an exit access door or intervening room the text would be too restrictive. In addition, requirements should not be in a definition.

Assembly Action:

None

Final Hearing Results

E111-06/07

AM

Code Change No: E113-06/07

Original Proposal

Sections: 1015.1, 1015.1.1, 1019.1, 1019.2 (IFC [B] 1015.1, [B] 1015.1.1, [B] 1019.1, [B] 1019.2)

Proponent: Philip Brazil, Reid Middleton, Inc., representing Washington Association of Building Officials (WABO)

Revise as follows:

1015.1 Exits or exit access doorways required from spaces. Two exits or exit access doorways from any space shall be provided where one of the following conditions exists:

1. The occupant load of the space exceeds one of the values in Table 1015.1.
2. The common path of egress travel exceeds one of the limitations of Section 1014.3.
3. Where required by Sections 1015.3, 1015.4, and 1015.5, 1015.6 or 1015.6.1.

Exception: Group I-2 occupancies shall comply with Section 1014.2.2.

**TABLE 1015.1
SPACES WITH ONE MEANS OF EGRESS**

OCCUPANCY	MAXIMUM OCCUPANT LOAD
A, B, E ^a , F, M, U	49
H-1, H-2, H-3	3
H-4, H-5, I-1, I-3, I-4, R	10
S	29

a. Day care maximum occupant load 10.

1015.1.1 Three or more exits or exit access doorways. ~~Access to three or more~~ Three exits or exit access doorways shall be provided from a floor area where required by Section 1019.1 any space with an occupant load of 501-1,000. Four exits or exit access doorways shall be provided from any space with an occupant load greater than 1,000.

1019.1 Minimum number of Exits from stories. ~~All rooms and spaces within each story shall be provided with and have access to the minimum number of approved independent exits as required by specified in Table 1019.1 based on the occupant load of the story, except as modified in Section 1015.1 or 1019.2. For the purposes of this chapter, occupied roofs shall be provided with exits as required for stories. The required number of exits from any story, basement or individual space shall be maintained until arrival at grade or the public way.~~

**TABLE 1019.1
MINIMUM NUMBER OF EXITS FOR OCCUPANT LOAD**

OCCUPANT LOAD (persons per story)	MINIMUM NUMBER OF EXITS (per story)
1-500	2
501-1,000	3
More than 1,000	4

1019.2 Buildings with one exit. Only one exit shall be required in buildings as ~~described~~ specified below:

1. Buildings ~~described in meeting the limitations of~~ Table 1019.2, provided that the building has not more than one level below the first story above grade plane.
2. Buildings of Group R-3 occupancy.
3. Single-level buildings with ~~the occupied spaces at the level of exit discharge provided that the story or each~~ space complies with Section 1015.1 as a space with one means of egress exit or exit access doorway.

**TABLE 1019.2
BUILDINGS WITH ONE EXIT**

OCCUPANCY	MAXIMUM HEIGHT OF BUILDING ABOVE GRADE PLANE	MAXIMUM OCCUPANTS (OR DWELLING UNITS) PER FLOOR AND TRAVEL DISTANCE
A, B ^d , E ^e , F, M, U	1 Story	49 occupants and 75 feet travel distance
H-2, H-3	1 Story	3 occupants and 25 feet travel distance
H-4, H-5, I, R	1 Story	10 occupants and 75 feet travel distance
S ^a	1 Story	29 occupants and 100 feet travel distance
B ^b , F, M, S ^a	2 Stories	30 occupants and 75 feet travel distance
R-2	2 Stories ^c	4 dwelling units and 50 feet travel distance

For SI: 1 foot = 304.8 mm.

- a. For the required number of exits for open parking structures, see Section 1019.1.1.
- b. For the required number of exits for air traffic control towers, see Section 412.1.
- c. Buildings classified as Group R-2 equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2 and provided with emergency escape and rescue openings in accordance with Section 1026 shall have a maximum height of three stories above grade plane.
- d. Buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 with an occupancy in Group B shall have a maximum travel distance of 100 feet.
- e. Day care maximum occupant load 10.

Reason: This proposal addresses questions raised by code users in the state of Washington concerning the application of Sections 1015.1, 1015.1.1, 1019.1 and 1019.2 in determining the required number of exits and exit access doorways. Section 1015.1 intends to specify when two exits or exit access doorways are required from a space. Section 1015.1.1 intends to specify when three or more exits or exit access doorways are required from a space. Section 1019.1 intends to specify the minimum number of exits from a story based on the occupant load of that story. At least two exits are required as specified in Table 1019.1. Section 1019.2 effectively serves as an exception to Section 1019.1, permitting a building to have one exit if certain conditions are met.

The proposal will make the application of the proposals clearer. The phrase “one off” is added to Items 1 and 2 of Section 1015.1 clarifying that not all of the values in Table 1015.1 need to be exceeded before two exits or exit access doorways are required from a space. Sections 1015.6 and 1015.6.1 are added to Item 3 of Section 1015.1 because of the requirements in those sections for means of egress.

The reference to Section 1019.1 in Section 1015.1.1 is replaced with language requiring more than two exits or exit access doorways from a space based on its occupant load. Note that Section 1019.1 does not require three or more exits from floor areas. The reference to “floor area” in Section 1015.1.1 is replaced with references to spaces for consistency with Section 1015.1. Section 1015.1.1 applies to spaces, not stories, which is implied by the reference to floor areas.

Section 1019.1 is revised to require access from all spaces within each story to the minimum number of exits for each story as specified in Table 1019.1, which is based on the occupant load of each story. Reference to “rooms” is deleted because Section 1014.1 refers only to spaces. Its presence in Section 1019.1 is superfluous and the lack of its presence in Section 1015.1 is a potential conflict.

Reference to Table 1019.1 for the required number of exits from spaces has been the source of much confusion and is deleted. The required number of exits from spaces is specified more comprehensively in Sections 1015.1 and 1015.1.1, which require two or more exits or exit access doorways from spaces based on their occupant load and other factors. Note that Table 1019.1 does not require a minimum number of exits from spaces, but does require a minimum number from each story. The phrase “approved independent” in Section 1019.1 is superfluous and is deleted. The phrase “basement or individual space” is also deleted. A basement is a story that is partly or completely below grade plane making it superfluous. A story is composed of spaces making reference to them superfluous since stories include them.

Reference to Section 1015.1 in Section 1019.1 is superfluous and is deleted. Section 1019.1 requires at least two exits from each story. Section 1015.1 requires two exits from certain spaces but does not require exits from stories. Consequently, Section 1015.1 would never modify the requirements of Section 1019.1. Section 1015.1.1 intends to require three exits or exit access doorways from spaces with an occupant load of 501-1,000 and four exits or exit access doorways from spaces with an occupant load greater than 1,000. This is consistent with Table 1019.1, which specifies three exits from stories with an occupant load of 501-1,000 and four exits from stories with an occupant load greater than 1,000.

The proposed revisions to Section 1019.2 are largely editorial. The charging statement and Item #1 are revised to mandatory language. In Item #3, reference to the story is deleted and the phrase “means of egress” is replaced with “exit or exit access doorway” because compliance with Section 1015.1 is dependent on the number of exits or exit access doorways from spaces, not from stories, and requirements for the means of egress are not specified other than exits or exit access doorways from spaces.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: Tables 1015.1, 1019.1 and 1019.2 are shown for information only.

Public Hearing Results

Committee Action:

Approved as Modified

Modify the proposal as follows:

1019.1 Exits from stories. All spaces within each story shall have access to the minimum number of approved independent exits as specified in Table 1019.1 based on the occupant load of the story, except as modified in Section 1015.1 or 1019.2. For the purposes of this chapter, occupied roofs shall be provided with exits as required for stories. The required number of exits from any story shall be maintained until arrival at grade or the public way.

(Portions of proposal not shown remain unchanged)

Committee Reason: The proposal will address floors with smaller occupant loads than the level above or below, separating exits from spaces and exits from stories. The language will also clear up a reference circle.

The modification was to leave in the term >approved independent-in Section 1019.1. This is important text to remain for the means of egress system.

Assembly Action:

None

Final Hearing Results

E113-06/07

AM

Code Change No: E115-06/07

Original Proposal

Sections: 1015.1, 1019.1 (IFC [B] 1015.1, [B] 1019.1)

Proponent: Maureen Traxler, City of Seattle, Washington, representing Washington Association of Building Officials

Revise as follows:

1015.1 Exit or exit access doorways required. Two exits or exit access doorways from any space shall be provided where one of the following conditions exists:

1. The occupant load of the space exceeds the values in Table 1015.1.

Exception: In Groups R-2 and R-3 occupancies, one means of egress is permitted within and from individual dwelling units with a maximum occupant load of 16 where the dwelling unit is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.

2. The common path of egress travel exceeds the limitations of Section 1014.3.
3. Where required by Sections 1015.3, 1015.4 and 1015.5.

Exception: Group I-2 occupancies shall comply with Section 1014.2.2.

1019.1 Minimum number of exits. All rooms and spaces within each story shall be provided with and have access to the minimum number of approved independent exits required by Table 1019.1 based on the occupant load of the story, except as modified in Section 1015.1 or 1019.2. For the purposes of this chapter, occupied roofs shall be provided with exits as required for stories. The required number of exits from any story, basement or individual space shall be maintained until arrival at grade or the public way.

Exception: In Groups R-2 and R-3 occupancies, one means of egress is permitted within and from individual dwelling units with a maximum occupant load of 16 where the dwelling unit is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.

Reason: This proposal allows one exit in some dwelling units. This proposal is consistent with the IRC provisions allowing one exit from dwelling units, and is safer because dwellings built according to the IBC will have sprinkler protection. This reduction in exiting requirements is mitigated by the familiarity of the occupants with the exits, and their control over the environment. The code still requires two exits from every story outside the dwelling unit.

This provision is important for small dwelling units where there often is not enough space for two exits. It's also important for larger dwelling units in multifamily buildings in which it can be impracticable to provide the required separation between exits, particularly for buildings on urban infill lots with small footprints.

The occupant load of 16 was chosen for consistency with new provisions for Group R congregate living facilities. According to Section 310.1, congregate living facilities with 16 or fewer persons are Group R-3 occupancies, and those with more are Group R-2 occupancies.

The proposal is limited to dwelling units that are less than 3,200 square feet (Table 1004.1.1 specifies 200 sq.ft./person x 16 occupants = 3,200 sq.ft.) which corresponds with maximum allowable area for dwellings with one exit in one of the legacy codes. Other provisions of Chapter 10 may require additional exits to be provided – provisions limiting the length of the common path of egress travel and travel distance will apply. The limit of 125 feet on common path of egress travel found in Section 1014.3 is an especially strict limit.

There are cases where multifloor dwelling units with a small floor area and small occupant load are required to have access to two exits from the upper floors. In these cases, the common path of egress travel, which will be measured along stairways, will limit the size of a dwelling that can have one exit.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Modified

Modify the proposal as follows:

1015.1 Exit or exit access doorways required. Two exits or exit access doorways from any space shall be provided where one of the following conditions exists:

- 1. The occupant load of the space exceeds the values in Table 1015.1.

Exception: In Groups R-2 and R-3 occupancies, one means of egress is permitted within and from individual dwelling units with a maximum occupant load of ~~46~~ 20 where the dwelling unit is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2.

- 2. The common path of egress travel exceeds the limitations of Section 1014.3.
- 3. Where required by Sections 1015.3, 1015.4 and 1015.5.

Exception: Group I-2 occupancies shall comply with Section 1014.2.2.

1019.1 Minimum number of exits. All rooms and spaces within each story shall be provided with and have access to the minimum number of approved independent exits required by Table 1019.1 based on the occupant load of the story, except as modified in Section 1015.1 or 1019.2. For the purposes of this chapter, occupied roofs shall be provided with exits as required for stories. The required number of exits from any story, basement or individual space shall be maintained until arrival at grade or the public way.

Exception: In Groups R-2 and R-3 occupancies, one means of egress is permitted within and from individual dwelling units with a maximum occupant load of ~~46~~ 20 where the dwelling unit is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2.

Committee Reason: This proposal specifically addressed allowances for a single exit access door from an individual dwelling unit. This is a common problem resulting from dwelling units getting larger without an increase in actual occupant load.. A concern was expressed on how this propose would affect Group R-2 dormitories or congregate residences.

A modification was made to also allow a NFPA 13R systems, commonly used in Group R occupancies, for this allowance for one means of egress.

A second modification was made to increase the occupant load to 20 so that this provision would cover a dwelling unit up to 4,000 square feet in area. A concern was expressed about this number possibly leading to confusion with 16 occupants being used to determine congregate residences that could use Group R-3 requirements.

Assembly Action:

None

Final Hearing Results

E115-06/07

AM

Code Change No: E122-06/07

Original Proposal

Sections: 1016.1, 1019.1, 1020.1 (IFC [B] 1016.1, [B] 1019.1, [B] 1020.1)

Proponent: Sarah A. Rice, CBO, Schirmer Engineering Corporation

Revise as follows:

1016.1 Travel distance limitations. Exits shall be so located on each story such that the maximum length of exit access travel, measured from the most remote point within a story to the entrance to an exit along the natural and unobstructed path of egress travel, shall not exceed the distances given in Table 1016.1.

Where the path of exit access includes unenclosed stairways or ramps within the exit access or includes ~~unenclosed exit ramps or stairways as permitted in Section 1020.4~~, the distance of travel on such means of egress components shall also be included in the travel distance measurement. The measurement along stairways shall be made on a plane parallel and tangent to the stair tread nosings in the center of the stairway.

Exceptions:

1. Travel distance in open parking garages is permitted to be measured to the closest riser of open stairs.
2. In outdoor facilities with open exit access components and open exterior stairs or ramps, travel distance is permitted to be measured to the closest riser of a stair or the closest slope of the ramp.
3. ~~Where an exit stair is permitted to be unenclosed in accordance with Exception 8 or 9 of Section 1019.1, the travel distance shall be measured from the most remote point within a building to an exit discharge. In other than occupancy Groups H and I, the exit access travel distance to a maximum of 50 percent of the exits is permitted to be measured from the most remote point within a building to an exit discharge using unenclosed stairways or ramps when connecting a maximum of 2 stories. The two connected stories shall be provided with at least two means of egress. Such interconnected stories shall not be open to other stories. The measurement along stairways shall be made on a plane parallel and tangent to the stair tread nosings in the center of the stairway.~~
4. In other than occupancy Groups H and I, exit access travel distance is permitted to be measured from the most remote point within a building to an exit discharge using unenclosed stairways or ramps in the first and second stories in buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1. The first and second stories shall be provided with at least two means of egress. Such interconnected stories shall not be open to other stories. The measurement along stairways shall be made on a plane parallel and tangent to the stair tread nosings in the center of the stairway.

1019.1 Minimum number of exits. All rooms and spaces within each story shall be provided with and have access to the minimum number of approved independent exits required by Table 1019.1 based on the occupant load of the story, ~~except as modified in Section 1015.1 or 1019.2~~. For the purposes of this chapter, occupied roofs shall be provided with exits as required for stories. The required number of exits from any story, basement or individual space shall be maintained until arrival at grade or the public way.

Exceptions:

1. As modified by Section 1015.1.
2. As modified by Section 1019.2.
3. Rooms and spaces within each story provided with and having access to a means of egress that complies with Exception 3 or 4 in Section 1016.1 shall not be required to be provide the minimum number of approved independent exits required by Table 1019 on each story.

1020.1 Enclosures required. Interior exit stairways and interior exit ramps shall be enclosed with fire barriers constructed in accordance with Section 706 or horizontal assemblies constructed in accordance with Section 711, or both. Exit enclosures shall have a fire-resistance rating of not less than 2 hours where connecting four stories or more and not less than 1 hour where connecting less than four stories. The number of stories connected by the exit enclosure shall include any basements but not any mezzanines. An exit enclosure shall not be used for any purpose other than means of egress.

Exceptions:

1. In all occupancies, other than Group H and I occupancies, a stairway is not required to be enclosed when the stairway serves an occupant load of less than 10 and the stairway complies with either Item 1.1 or 1.2. In all cases, the maximum number of connecting open stories shall not exceed two.
 - 1.1. The stairway is open to not more than one story above the story at the level of exit discharge; or
 - 1.2. The stairway is open to not more than one story below the story at the level of exit discharge.
2. Exits in buildings of Group A-5 where all portions of the means of egress are essentially open to the outside need not be enclosed.
3. Stairways serving and contained within a single residential dwelling unit or sleeping unit in Group R-1, R-2 or R-3 occupancies are not required to be enclosed.
4. ~~Stairways that are not a required means of egress element are not required to be enclosed where such stairways comply with Section 707.2.~~
5. Stairways in open parking structures that serve only the parking structure are not required to be enclosed.
6. Stairways in Group I-3 occupancies, as provided for in Section 408.3.6, are not required to be enclosed.
7. Means of egress stairways as required by Section 410.5.3 are not required to be enclosed.

- ~~8. In other than Group H and I occupancies, a maximum of 50 percent of egress stairways serving one adjacent floor are not required to be enclosed, provided at least two means of egress are provided from both floors served by the unenclosed stairways. Any two such interconnected floors shall not be open to other floors. Unenclosed exit stairways shall be remotely located as required in Section 1015.2.~~
- ~~9. In other than Group H and I occupancies, interior egress stairways serving only the first and second stories of a building equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 are not required to be enclosed, provided at least two means of egress are provided from both floors served by the unenclosed stairways. Such interconnected stories shall not be open to other stories. Unenclosed exit stairways shall be remotely located as required in Section 1015.2.~~

Reason: There appears to be two distinct egress concepts that though integrally tied, are being confused. How exit access travel distance is measured (Section 1016.1) and when exits are required to be enclosed in fire rated constructions (Section 1020.1).

Section 1016.1 is intended to tell the code user how to measure “exit access travel distance” , e.g., from the most remote point on a story to an “exit.” Section 1020.1 tells the code user that all exits are to be enclosed in fire rated construction, and more importantly, the conditions when an exit is not required to be enclosed in fire rated construction. In multiple story buildings, that “exit” is typically an interior stairway or an exterior stairway, separated from the remainder of the story by fire rated construction.

Through past code change activity, the membership has accepted the concept that exit access travel distance does not always have to terminate at an “exit” which is located on that story, but under certain circumstances (those found in Exceptions 8 & 9 in Section 1020.1) can continue down a vertical egress element until the exit access travel distance is exceeded. At that point, regardless of where within the building the person is they must enter an “exit” that is enclosed in fire rated construction.

We do not disagree with the concept of allowing the exit access travel distance to continue past what has traditionally been the termination point, the top of a stairway. But we do feel that code, as currently written in Sections 1016.1 and 1020.1, does not accurately depict the concept. Rather than making the allowance for exit access travel distance to extend past the story in which it started in Section 1016.1, the code has made exceptions to when a vertical exit is required to be enclosed in Section 1020.1.

The proposed language here, and in Section 1020.1, seeks to clarify the application of this concept. The exceptions now found in Section 1020.1 are proposed for deletion and relocated into Section 1016.1. In addition, the current arrangement of the concept of measuring exit access travel distance has created confusion with regard to the application of other provisions within the code, e.g., enclosure of exit access corridors, levels of exit discharge, exit passageways.

Regarding the deletion of Exception 4: Section 1020 is only applicable to “vertical exit enclosures.” One would not even look to Section 1020 for a stair that is not an “exit.” Openings created by stairs that are not exits are not treated unlike any other opening in a floor assembly. They are classified as “openings” in horizontal assemblies and subject to the applicable provisions for such, potentially shaft enclosures or classification as an atrium. Retaining the text of Exception 4 is misleading as it seems to imply that stairs that are not exits are in some way regulated by the provisions of Section 1020 when this is untrue. The proposed deletion of Exception 4 removes any possible confusion.

The intent of the revision to Section 1019.1 is to address the concern over two exit access stairways being provided from a 2nd floor when two exits were required. This is basically a correlation issue.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Modified

Modify proposal as follows:

1016.1 Travel distance limitations. Exits shall be so located on each story such that the maximum length of exit access travel, measured from the most remote point within a story to the entrance to an exit along the natural and unobstructed path of egress travel, shall not exceed the distances given in Table 1016.1.

Where the path of exit access includes unenclosed stairways or ramps within the exit access the distance of travel on such means of egress components shall also be included in the travel distance measurement. The measurement along stairways shall be made on a plane parallel and tangent to the stair tread nosings in the center of the stairway.

Exceptions:

1. Travel distance in open parking garages is permitted to be measured to the closest riser of open stairs.
2. In outdoor facilities with open exit access components and open exterior stairs or ramps, travel distance is permitted to be measured to the closest riser of a stair or the closest slope of the ramp.
3. In other than occupancy Groups H and I, the exit access travel distance to a maximum of 50 percent of the exits is permitted to be measured from the most remote point within a building to an exit discharge using unenclosed stairways or ramps when connecting a maximum of 2 stories. The two connected stories shall be provided with at least two means of egress. Such interconnected stories shall not be open to other stories. The measurement along stairways shall be made on a plane parallel and tangent to the stair tread nosings in the center of the stairway.
4. In other than occupancy Groups H and I, exit access travel distance is permitted to be measured from the most remote point within a building to an exit discharge using unenclosed stairways or ramps in the first and second stories in buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1. The first and second stories shall be provided with at least two means of egress. Such interconnected stories shall not be open to other stories. The measurement along stairways shall be made on a plane parallel and tangent to the stair tread nosings in the center of the stairway.

(Portions of proposal not shown remain unchanged)

Committee Reason: The proposal moves exit access requirements out of the current exit requirements in Section 1020.1 and into the correct location, Section 1016.1. This clarifies the limits for the open stairways that are part of the means of egress and their use in the building. The modification deleted the term ‘discharge’ from Section 1016.1 in Exceptions 3 and 4. Travel down the open exit access stairways could lead to an enclosed exit stairway, and not always directly to the door to the outside (i.e. exit discharge).

Assembly Action:

None

Final Hearing Results

E122-06/07

AM

Code Change No: **E130-06/07**

Original Proposal

Sections: 1017.3 (IFC [B] 1017.3)**Proponent:** William E. Koffel, P.E., Koffel Associates, Inc.**Revise as follows:**

1017.3 Dead ends. Where more than one exit or exit access doorway is required, the exit access shall be arranged such that there are no dead ends in corridors more than 20 feet (6096 mm) in length.

Exceptions:

1. In occupancies in Group I-3 of Occupancy Condition 2, 3 or 4 (see Section 308.4), the dead end in a corridor shall not exceed 50 feet (15 240 mm).
2. In occupancies in Groups B₁ and E, F, I-1, M, R-1, R-2, R-4, S, and U, where the building is equipped throughout with an automatic sprinkler system in accordance with 903.3.1.1, the length of the dead-end corridors shall not exceed 50 feet (15 240 mm).
3. A dead-end corridor shall not be limited in length where the length of the dead-end corridor is less than 2.5 times the least width of the dead-end corridor.

Reason: The allowance of 50 foot dead-end corridors in fully sprinkler protected buildings is consistent with other national codes, including the 2006 Edition of NFPA 101 Table A.7.6, the 2006 Edition of NFPA 5000, the 2006 Edition of the International Existing Building Code (2006 IEBC), and the 2006 Edition of the International Fire Code (IFC). In other than Group A and H occupancies, the 2006 IEBC permits newly created dead-end corridors of 50 feet on floors protected with an automatic sprinkler system in accordance with the 2006 International Building Code (IBC) for Alterations – Level 2 (605.6 exc. 4) and Alterations – Level 3 (705.1). In addition, Section 812.4.1.1 (Means of egress for change in occupancy to higher hazard) of the 2006 IEBC references Section 605.6 for existing dead-end corridors. Further, when the change of occupancy complies with Section 812.3 of the 2006 IEBC, Section 812.4.1.2 (Means of egress for change of use to equal or lower hazard category) of the 2006 IEBC allows existing dead-end corridors no matter what length to remain regardless of the presence of an automatic sprinkler system. Section 1027.17.2 of the 2006 IFC permits dead-end corridors of 50 feet in buildings with an automatic sprinkler system in accordance with the 2006 IFC.

Once a new building is given its Use & Occupancy approval, any future work in the building can reference the 2006 IEBC and 2006 IFC requirements. The lack of conformity between the 2006 IBC and the 2006 IEBC and the 2006 IFC creates a conflict when future Alteration level work occurs. Amending Section 1017.3 of the 2006 IBC to allow 50 foot dead-end corridors in buildings containing the proposed occupancies, where the building is protected throughout with an automatic sprinkler system in accordance with NFPA 13 requirements allows for consensus between the two ICC building codes and the 2006 IFC. A similar code change is necessary for the Section 1017.3 (new dead-end corridors) of the 2006 IFC to address the allowable dead-end corridor distance of the 2006 IEBC and Section 1027.17.2 of the 2006 IFC.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:**Approved as Submitted**

Committee Reason: The committee agreed that a 50 foot dead end corridor would allow for safe egress and increase design options. It was noted that a NFPA 13 system was required for this increase even for Group R occupancies.

Assembly Action:

None

Final Hearing Results

E130-06/07

AS

Code Change No: E134-06/07

Original Proposal

Sections: 1019.1.2 (IFC [B] 1019.1.2)

Proponent: Robert Bagnetto, Lapeyre Stair, Inc./Laitram Corp.

Revise as follows:

1019.1.2 Helistops. The means of egress from helistops shall comply with the provisions of this chapter, provided that landing areas located on buildings or structures shall have two or more exits. For landing platforms or roof areas less than 60 feet (18 288 mm) long, or less than 2,000 square feet (186 m²) in area, the second means of egress is permitted to be a fire escape, alternating tread device, or ladder leading to the floor below.

Reason: The purpose of this proposed code change to IBC-2006 is to allow the use of alternating tread devices as a means of egress from Helistops.

IBC-2006 Section 1019.1.2 is overly restrictive in that it does not allow the use of alternating tread devices as a means of egress from Helistops. IBC-2003 allows the use of alternating tread devices in sections, including but not limited to, 1009.11, 1015.3, 1015.4, and 1015.6.1. Alternating tread devices are typically safer to use than ladders and would be suitable for the application specified in section 1019.1.2. This proposal is superior to the current code in that it allows an additional adequate means of egress from Helistops that is not allowed under the current code.

Cost Impact: The change could result in a minor increase in construction costs if alternating tread devices are used in lieu of ladders as the second means of egress to Helistops.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The alternating tread device provides the same level of safety as the ladder, which is already permitted by the code as a second exit from helistops.

Assembly Action:

None

Final Hearing Results

E134-06/07

AS

Code Change No: E136-06/07

Original Proposal

Sections: 1019.2, Table 1019.2, 1019.3 (New) [IFC [B] 1019.2, [B] Table 1019.2, [B] 1019.3 (New)]

Proponent: Lori Lee Graham, City of Portland, Oregon

1. Revise as follows:

1019.2 Buildings Stories with one exit. Only one exit shall be required in ~~buildings~~ from stories as described below:

1. ~~Buildings~~ Stories described in Table 1019.2, ~~provided that the building has not more than one level below the first story above grade plane.~~

2. Buildings of Group R-3 occupancy.
3. Single-level buildings with the occupied space at the level of exit discharge provided that the story or space complies with Section 1015.1 as a space with one means of egress.

2. Delete table and substitute as follows:

TABLE 1019.2
BUILDINGS WITH ONE EXIT

OCCUPANCY	MAXIMUM HEIGHT OF BUILDING ABOVE GRADE PLANE	MAXIMUM OCCUPANTS (OR DWELLING UNITS) PER FLOOR AND TRAVEL DISTANCE
A, B ^a , E ^e , F, M, U	1 Story	49 occupants and 75 feet travel distance
H-2, H-3	1 Story	3 occupants and 25 feet travel distance
H-4, H-5, I, R	1 Story	10 occupants and 75 feet travel distance
S ^a	1 Story	29 occupants and 100 feet travel distance
B ^b , F, M S ^a	2 Stories	30 occupants and 75 feet travel distance
R-2	2 Stories	4 dwelling units and 50 feet travel distance

For SI: 1 foot = 304.8 mm.

- a. For the required number of exits for parking structures, see Section 1019.1.1.
- b. For the required number of exits for air traffic control towers, see Section 412.1.
- c. Buildings classified as Group R-2 equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2 and provided with emergency escape and rescue openings in accordance with Section 1026 shall have a maximum height of three stories above grade plane.
- d. Buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 with an occupancy in Group B shall have a maximum travel distance of 100 feet.
- e. Day care maximum occupant load is 10.

TABLE 1019.2
STORIES WITH ONE EXIT

STORY ABOVE GRADE PLANE	OCCUPANCY	MAXIMUM OCCUPANTS (OR DWELLING UNITS) PER FLOOR AND TRAVEL DISTANCE TO EXIT
First story or basement	A, B ^d , E ^e , F ^d , M, U, S ^d	49 occupants and 75 feet travel distance
	H-2, H-3	3 occupants and 25 feet travel distance
	H-4, H-5, I, R	10 occupants and 75 feet travel distance
	S ^a	29 occupants and 100 feet travel distance
Second story	B ^b , F, M, S ^a	29 occupants and 75 feet travel distance
	R-2	4 dwelling units and 50 feet travel distance
Third Story	R-2 ^c	4 dwelling units and 50 feet travel distance

- a. For the required number of exits for parking structures, see Section 1019.1.1.
- b. For the required number of exits for air traffic control towers, see Section 412.1.
- c. Emergency escape and rescue openings as provided in accordance with Section 1026.
- d. Group B, F and S occupancies in buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 shall have a maximum travel distance of 100 feet.
- e. Day care occupancies shall have a maximum occupant load of 10.

1019.3 Egress from multi-story dwelling units. Only one exit is required from individual multi-story dwelling units located in buildings of any height provided the dwelling unit meets all of the following requirements:

1. The individual dwelling unit occupies not more than three stories; and

2. The exit from the dwelling unit is located at the level of exit discharge or is located to provide immediate access to not less than two approved independent exits from the story; and
3. The dwelling unit complies with Section 1015.1 as a space with one means of egress.

Reason: The purpose of the proposed code change is to provide clarity to egress review in conditions where only one exit is provided. The reasons are as follows:

- Confusion Regarding Application of Table: Table 1019.2 has caused great confusion amongst the plans examiners and the public. Frequently a building has multiple exits on the Ground Level and people have assumed that the table does not apply in these conditions. Yet, oftentimes, the exits are not available to all spaces or tenants.
- Mixed Occupancies: Table 1019.2 does not address mixed occupancies and yet planning codes are encouraging mixed occupancies. It is common to have residential use over commercial space but frequently the access and egress systems are completely independent of each other.
- Multiple Tenants: This code section fails to address the separations that occur in buildings due to multiple tenant spaces. Tenant configurations have become less standardized. Tenants frequently want to control access and egress from their space.
- Discrepancy in Application: The current table treats the first story of a two story building differently than a one-story building. This makes no sense. It would be preferable to review each level separately. For instance, under the current table, a one story mercantile building may have 50 occupants and 75 feet travel distance but the first story of a two story mercantile building may only have 30 occupants.

Examples:

- A two-story office building has separate tenant spaces on each story. There is a lobby shared by both tenants with a stair serving the 2nd floor tenant. There is a 2nd door, leading from the ground level tenant space to the parking lot. The 2nd floor does not have a 2nd exit access.
- A two story office building with a demising wall separating the building into two, two-story spaces. Each tenant has its own entrance and stair. There is no shared exit way.
- Three story, mixed use building with Retail on the first floor, offices on the 2nd floor and apartments on the 3rd floor. The offices and apartments share one exit stair. The Retail tenants have individual exits.

Substantiation: The proposed table evaluates the egress system based on the specific story in question and the occupancy of that story. This provides more flexibility in evaluating egress systems when there are mixed occupancies or multiple tenants. It also reduces the confusion that the present table has created.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: The proponent has a similar proposal that matches the last new section proposed, Section 1019.3. If approved, the committee should be aware of the different location for the proposed text.

Public Hearing Results

Committee Action:

Approved as Modified

Modify the proposal as follows:

**TABLE 1019.2
STORIES WITH ONE EXIT**

(No change to content of table)

- a. For the required number of exits for parking structures, see Section 1019.1.1.
- b. For the required number of exits for air traffic control towers, see Section 412.1.
- c. Emergency escape and rescue openings as provided in accordance with Section 1026. Buildings classified as Group R-2 equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2 and provided with emergency escape and rescue openings in accordance with Section 1026.
- d. Group B, F and S occupancies in buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 shall have a maximum travel distance of 100 feet.
- e. Day care occupancies shall have a maximum occupant load of 10.

~~**1019.3 Egress from multi-story dwelling units.** Only one exit is required from individual multi-story dwelling units located in buildings of any height provided the dwelling unit meets all of the following requirements:~~

1. ~~The individual dwelling unit occupies not more than three stories; and~~
2. ~~The exit from the dwelling unit is located at the level of exit discharge or is located to provide immediate access to not less than two approved independent exits from the story; and~~
3. ~~The dwelling unit complies with Section 1015.1 as a space with one means of egress.~~

(Portions of proposal not shown remain unchanged)

Committee Reason: The proposal clarifies the intent of the code. The charging statement in 1019.1 states that every story has two exits. The proposal carries on with that and references stories again versus the entire building. The proposal will allow for small 2nd floors or basements that meet the travel distance over a much larger 1st floor to have single exits. Note c from the original text will be maintained. It is necessary to provide information that for a single exit to be permitted, both a sprinkler system and emergency escape window are necessary for adequate safety. A modification was offered by the proponent for the deletion of proposed section 1019.3 since it was already addressed by committee action on E115-06/07 and E135-06/07.

Assembly Action:

None

Final Hearing Results

E136-06/07

AM

Code Change No: E138-06/07

Original Proposal

Sections: 1020.1 (IFC [B] 1020.1)

Proponent: Jason T. Thompson, National Concrete Masonry Alliance (NCMA), representing Masonry Alliance for Codes and Standards (MACS)

Revise as follows:

1020.1 Enclosures required. Interior exit stairways and interior exit ramps shall be enclosed with fire barriers constructed in accordance with Section 706 or horizontal assemblies constructed in accordance with Section 711, or both. Exit enclosures shall have a fire-resistance rating of not less than 2 hours where connecting four stories or more and not less than 1 hour where connecting less than four stories. The number of stories connected by the exit enclosure shall include any basements but not any mezzanines. Exit enclosures shall have a fire-resistance rating not less than the floor assembly penetrated, but need not exceed 2 hours. An exit enclosure shall not be used for any purpose other than means of egress.

Exceptions:

1. In all occupancies, other than Group H and I occupancies, a stairway is not required to be enclosed when the stairway serves an occupant load of less than 10 and the stairway complies with either Item 1.1 or 1.2. In all cases, the maximum number of connecting open stories shall not exceed two.
 - 1.1. The stairway is open to not more than one story above the story at the level of exit discharge; or
 - 1.2. The stairway is open to not more than one story below the story at the level of exit discharge.
2. Exits in buildings of Group A-5 where all portions of the means of egress are essentially open to the outside need not be enclosed.
3. Stairways serving and contained within a single residential dwelling unit or sleeping unit in Group R-1, R-2 or R-3 occupancies are not required to be enclosed.
4. Stairways that are not a required means of egress element are not required to be enclosed where such stairways comply with Section 707.2.
5. Stairways in open parking structures that serve only the parking structure are not required to be enclosed.
6. Stairways in Group I-3 occupancies, as provided for in Section 408.3.6, are not required to be enclosed.
7. Means of egress stairways as required by Section 410.5.3 are not required to be enclosed.
8. In other than Group H and I occupancies, a maximum of 50 percent of egress stairways serving one adjacent floor are not required to be enclosed, provided at least two means of egress are provided from both floors served by the unenclosed stairways. Any two such interconnected floors shall not be open to other floors. Unenclosed exit stairways shall be remotely located as required in Section 1015.2.
9. In other than Group H and I occupancies, interior egress stairways serving only the first and second stories of a building equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 are not required to be enclosed, provided at least two means of egress are provided from both floors served by the unenclosed stairways. Such interconnected stories shall not be open to other stories. Unenclosed exit stairways shall be remotely located as required in Section 1015.2.

Reason: The purpose of this code change is for vertical exit enclosures to have their minimum required fire-resistance rating determined in the same manner as required for shaft enclosures in Section 707.4. The added text is taken from the last sentence of that section. Since a vertical exit enclosure is basically the same as a shaft enclosure in regard to the protection of vertical openings penetrating multiple floors, the minimum fire-resistance rating requirements should be the same.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The proposal will promote consistency between the floor rating requirements and the vertical enclosure ratings. A concern was expressed regarding the lack of substantiation for this change.

Assembly Action:

None

Final Hearing Results

E138-06/07

AS

Code Change No: **E139-06/07**

Original Proposal

Sections: 1011.3, 1020.1.6 (IFC [B] 1011.3, [B] 1020.1.6), 1110.3

Proponent: Bill Conner, Conner Associates LLC, representing himself

Revise as follows:

1011.3 Tactile exit signs. A tactile sign stating EXIT and complying with ICC A117.1 Section 703.3 shall be provided adjacent to each door to an egress ~~exit~~ stairway, an exit ramp, an exit passageway and the exit discharge.

1020.1.6 Stairway Floor number signs. A sign shall be provided at each floor landing in interior exit enclosures connecting more than three stories designating the floor level, the terminus of the top and bottom of the ~~stair exit~~ enclosure and the identification of the stair or ramp. The signage shall also state the story of, and the direction to the exit discharge and the availability of roof access from the ~~stairway enclosure~~ for the fire department. The sign shall be located 5 feet (1524 mm) above the floor landing in a position that is readily visible when the doors are in the open and closed positions. Floor level identification signs in tactile characters complying with ICC A117.1, Section 703.3 shall be located at each floor level landing adjacent to the door leading from the enclosure into the corridor to identify the floor level.

1110.3 Other signs. Signage indicating special accessibility provisions shall be provided as shown:

1. Each assembly area required to comply with Section 1108.2.6 shall provide a sign notifying patrons of the availability of assistive listening systems.

Exception: Where ticket offices or windows are provided, signs are not required at each assembly area provided that signs are displayed at each ticket office or window informing patrons of the availability of assistive listening systems.

2. At each door to an egress stairway, exit passageway and exit discharge, signage shall be provided in accordance with Section 1011.3.
3. At areas of refuge, signage shall be provided in accordance with Sections 1007.6.3 through 1007.6.5.
4. At areas for assisted rescue, signage shall be provided in accordance with Section 1007.8.3.
5. Within exit enclosures signage shall be provided in accordance with Section 1020.1.6.

Reason: Tactile signs should also be required at exit ramps, similar to exit stairways. Exit signage is not required at all stairways, just exit stairways. The change will also coordinate with ADAAG 216.4.1 and ICC A117.1 504.9.

Persons with visual impairments need to know what floor level they are on both for general use and emergency situations. This is coordination with ICC A117.1 504.9. The proposal to Section 1110.3 is coordination only.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:**Disapproved**

Committee Reason: The proposal was disapproved because the reason was given as coordination with ICC A117.1 and floor number signs are not required by ICC A117.1. The IBC should not reference specific sections of the ICC A117.1 standard.

Assembly Action:**None**

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Bill Conner, representing himself, requests Approval as Modified by this public comment.

Modify proposal as follows:

1011.3 Tactile exit signs. A tactile sign stating EXIT and complying with ICC A117.1 ~~Section 703.3~~ shall be provided adjacent to each door to an exit stairway, an exit ramp, an exit passageway and the exit discharge.

1020.1.6 Floor number signs. A sign shall be provided at each floor landing in interior exit enclosures connecting more than three stories designating the floor level, the terminus of the top and bottom of the exit enclosure and the identification of the stair or ramp. The signage shall also state the story of, and the direction to the exit discharge and the availability of roof access from the enclosure for the fire department. The sign shall be located 5 feet (1524 mm) above the floor landing in a position that is readily visible when the doors are in the open and closed positions. Floor level identification signs in tactile characters complying with ICC A117.1, ~~Section 703.3~~ shall be located at each floor level landing adjacent to the door leading from the enclosure into the corridor to identify the floor level.

1110.3 Other signs. Signage indicating special accessibility provisions shall be provided as shown:

1. Each assembly area required to comply with Section 1108.2.6 shall provide a sign notifying patrons of the availability of assistive listening systems.

Exception: Where ticket offices or windows are provided, signs are not required at each assembly area provided that signs are displayed at each ticket office or window informing patrons of the availability of assistive listening systems.

2. At each door to an egress stairway, exit passageway and exit discharge, signage shall be provided in accordance with Section 1011.3.
3. At areas of refuge, signage shall be provided in accordance with Sections 1007.6.3 through 1007.6.5.
4. At areas for assisted rescue, signage shall be provided in accordance with Section 1007.8.3.
5. Within exit enclosures signage shall be provided in accordance with Section 1020.1.6.

Commenter's Reason: The reference to Section 703.3 in ICC A117.1 was intended to provide specific direction to appropriate requirements for the signage rather than a general reference, but based on the committee comments, it has been removed from the proposal.

The committee was incorrect in its assumption that floor level identification is not found in A117.1. See ICC A117.1-2003, Section 504.9. It is proposed to add this important safety information into the building code. This is not just an accessibility issue.

Final Hearing Results

E139-06/07**AMPC1**

Code Change No: **E140-06/07**

Original Proposal

Sections: 1020.1.6, 1020.1.6.1 (New) [IFC [B] 1020.1.6, [B] 1020.1.6.1 (New)]

Proponent: Dave Frable, U.S. General Services Administration

Revise as follows:

1020.1.6 Stairway identification floor number signs. A sign shall be provided at each floor landing in interior exit enclosures connecting more than three stories designating the floor level, the terminus of the top and bottom of the stair enclosure and the identification of the stair. The signage shall also state the story of, and the direction to the exit discharge and the availability of roof access from the stairway for the fire department. The sign shall be located 5 feet (1524 mm) above the floor landing in a position that is readily visible when the doors are in the open and closed positions.

1020.1.6.1 Signage requirements. Stairway identification signs shall comply with all of the following requirements:

1. The signs shall be a minimum size of 18 inches (457 mm) by 12 inches (305 mm).
2. The letters designating the identification of the stair enclosure shall be a minimum of 1-1/2 inches (38 mm) in height.
3. The number designating the floor level shall be a minimum of 5 inches (127 mm) in height and located in the center of the sign.
4. All other lettering and numbers shall be a minimum of 1 inch in height (22 mm).
5. Characters and their background shall have a nonglare finish. Characters shall contrast with their background, with either light characters on a dark background, or dark characters on a light background.

Reason: The only intent of this code change proposal is to revise the title of this section to a title that more accurately reflects the content of the Section. In addition, the proposed signage requirements will provide some sort of consistency for stairway identification signs across the U.S. The signage requirements are based on current GSA requirements as well current signage requirement in the NFPA 101, *Life Safety Code*.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The proposal adds necessary clarification and standardization to the code regarding stairway floor signage requirements.

Assembly Action:

None

Final Hearing Results

E140-06/07

AS

Code Change No: **E146-06/07**

Original Proposal

Sections: 1022.4 (New) [IFC [B] 1022.4 (New)

Proponent: Dennis Richardson, City of San Jose, CA Building Division, representing Tri-Chapter Code Committee (Peninsula, East Bay and Monterey Chapters of ICC)

Add new text as follows:

1022.4 Ducts and air transfer openings, Ducts and air transfer openings through fire walls or fire barriers, forming a horizontal exit, shall be designed and protected in accordance with Section 716 in order to afford safety from both fire and smoke in the refuge area. All ducts and air transfer openings shall be protected by listed combination fire/smoke dampers.

Reason: The purpose of the code change is to provide code language that implements the intent of Section 1002.1, definition of Horizontal Exit. Horizontal exits are intended to afford safety from both fire **and smoke**.

No code provisions specifically require duct and air transfer openings in horizontal exit walls to be designed and protected in order to afford safety from both fire and smoke in the refuge area.

Section 1022.2 Separation, refers to sections 705 and 706 which refer to 716.5.1 and 716.5.2 There are no provisions in 716.5.1 Fire walls, and 716.5.2 Fire barriers, requiring ducts and air transfer openings in horizontal exit walls to be protected by anything other than fire dampers.

Cost Impact: The code change proposal will not increase the cost of construction as the definition of Horizontal Exit is very clear. It is currently the intent of the code to provide protection from smoke in addition to fire for horizontal exits. It appears the lack of such implementing code language is an oversight in the current code.

Analysis: If approved, would this section conflict with duct and transfer opening requirements for fire walls Section 705.10 or fire barrier in Section 706.10?

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The proponent has identified a missing item in the code that needs be addressed, however, the reference to Section 716 jumps over limitations in fire walls and fire barriers. This language would better located in Chapter 7.

Assembly Action:

None

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Dennis Richardson, City of San Jose, Building Division, representing Tri-Chapter Code Committee (Peninsula, East Bay, and Monterey Bay Chapters of ICC) requests Approval as Modified by this public comment.

Replace proposal with the following:

716.5.1.1 Horizontal Exits. A listed smoke damper designed to resist the passage of smoke shall be provided at each point a duct or air transfer opening penetrates a fire wall or fire barrier that serves as a horizontal exit.

716.5.2.1 Horizontal Exits. A listed smoke damper designed to resist the passage of smoke shall be provided at each point a duct or air transfer opening penetrates a fire wall or fire barrier that serves as a horizontal exit.

1022.2 Separation. The separation between buildings or refuge areas connected by a horizontal exit shall be provided by a fire wall complying with Section 705 or a fire barrier complying with Section 706 and having a fire-resistance rating of not less than 2 hours. Opening protectives in horizontal exit walls shall also comply with Section 715. Duct and air transfer openings in a fire wall or fire barrier that serves as a horizontal exit shall also comply with Section 716. The horizontal exit separation shall extend vertically through all levels of the building unless floor assemblies have a fire-resistance rating of not less than 2 hours with no unprotected openings.

Commenter's Reason: The committee acknowledged smoke dampers are missing for fire walls and fire barriers serving as horizontal exit walls in the present code language. This public comment addresses the concern raised by the committee that the original language in E146 creating a new section to address this issue jumped over references to Sections 705 and 706 found in Section 1022.2 of the present code language. By adding the reference to Section 716 in a similar manner as the reference to Section 715 found in Section 1022.2, the public comment language preserves the integrity of the references to Sections 705 and 706 found in Section 1022.2. Sections 716.5.1.1 and 716.5.2.1 are added in Chapter 7 to clarify smoke dampers are required in addition to fire dampers for fire walls and fire barriers serving as a horizontal exit wall but not in other fire walls and fire barriers.

Final Hearing Results

E146-06/07

AMPC1

Code Change No: E147-06/07

Original Proposal

Sections: 1023.2 (IFC [B] 1023.2)

Proponent: Tim Pate, City and County of Broomfield, Colorado Building Department, representing Colorado Chapter ICC

Revise as follows:

1023.2 Use in a means of egress. Exterior exit ~~ramps and~~ stairways shall not be used as an element of a required means of egress for Group I-2 occupancies. For occupancies in other than Group I-2, exterior exit ramps and stairways shall be permitted as an element of a required means of egress for buildings not exceeding six stories above grade plane or having occupied floors more than 75 feet (22 860 mm) above the lowest level of fire department vehicle access.

Reason: This proposal will delete the requirement that does not allow an exterior exit ramp to be used as a part of the means of egress (exit discharge) for an I-2 occupancy. The code would allow an exit ramp to be used within the building to access the exit so it does not make sense to not allow the same type of exit ramp to be used at the exterior discharge. The ramp would be constructed with the proper maximum slope, handrails, edge protection, etc. so that it would be just as safe on the exterior as it is on interior. The code also regulates outdoor conditions as per Section 1010.7.2 which would make sure water would not accumulate on the walking surface.

The change that put this in – E60/02, was adding 'ramps and' to multiple sections that addressed 'stairways'. The reason states "This proposal is to recognize that exterior exit elements can also include ramps. The same protection criteria applied to stairways is also applicable to ramps when used as part of the exit system." It appears this change, especially when a high percentage of the people could be in wheelchairs or even in beds, inadvertently resulted in a prohibition for exterior ramps for Group I-2 occupancies.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: While the committee agreed that ramps should be permitted as part of the means of egress from Group I-2 facilities at some level, with the current deletion, the second sentence of the section would then allow a Group I-2 to have an exit ramp of any height.

Assembly Action:

None

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Tim Pate, City and County of Broomfield, Colorado, representing himself, requests Approval as Modified by this public comment.

Replace proposal as follows:

1023.2 Use in a means of egress. Exterior exit ramps with a rise of more than one story and stairways shall not be used as an element of a required means of egress for Group I-2 occupancies. For occupancies in other than Group I-2, exterior exit ramps and stairways shall be permitted as an element of a required means of egress for buildings not exceeding six stories above grade plane or having occupied floors more than 75 feet (22 860 mm) above the lowest level of fire department vehicle access.

Commenter's Reason: The intent of the original code change was to allow exterior ramps to serve as part of required means of egress for Group I-2 occupancies since ramps could also be used as part of the exit access within the same occupancy. The committee agreed that an exterior ramp should be allowed. They had concern that the original wording would then allow an exterior ramp of any height. This modification would restrict the height of the exterior ramp to one story or less. This modified change would then allow I-2 occupancies to be built on sites where the required exits are not always at grade.

Final Hearing Results

E147-06/07

AS

Code Change No: E150-06/07

Original Proposal

Sections: 1024.1 (IFC [B] 1024.1)

Proponent: Jason T. Thompson, National Concrete Masonry Alliance (NCMA), representing Masonry Alliance for Codes and Standards (MACS)

Revise as follows:

1024.1 General. Exits shall discharge directly to the exterior of the building. The exit discharge shall be at grade or shall provide direct access to grade. The exit discharge shall not reenter a building.

Exceptions:

1. A maximum of 50 percent of the number and capacity of the exit enclosures is permitted to egress through areas on the level of discharge provided all of the following are met:
 - 1.1. Such exit enclosures egress to a free and unobstructed way to the exterior of the building, which way is readily visible and identifiable from the point of termination of the exit enclosure.
 - 1.2. The entire area of the level of discharge is separated from areas below by construction conforming to the fire-resistance rating for the exit enclosure.
 - 1.3. The egress path from the exit enclosure on the level of discharge is protected throughout by an approved automatic sprinkler system. All portions of the level of discharge with access to the egress path shall either be protected throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2, or separated from the egress path in accordance with the requirements for the enclosure of exits.
2. A maximum of 50 percent of the number and capacity of the exit enclosures is permitted to egress through a vestibule provided all of the following are met:
 - 2.1. The entire area of the vestibule is separated from areas below by construction conforming to the fire-resistance rating for the exit enclosure.
 - 2.2. The depth from the exterior of the building is not greater than 10 feet (3048 mm) and the length is not greater than 30 feet (9144 mm).
 - 2.3. The area is separated from the remainder of the level of exit discharge by construction providing protection at least the equivalent of approved wired glass in steel frames.
 - 2.4. The area is used only for means of egress and exits directly to the outside.

3. Stairways in open parking garages complying with Section 1020.1, Exception 5, are permitted to egress through the open parking garage at the level of exit discharge.
4. Horizontal exits complying with Section 1022 shall not be required to discharge directly to the exterior of the building.

Reason: This proposed code change corrects an oversight in the International Building Code (IBC). A horizontal exit complying with Section 1022 is a unique type of exit that is located generally within the middle of a story. It subdivides the story into separate areas by 2-hour fire-resistive wall construction to create refuge areas on either side of the horizontal exit wall. The code allows the doors in the horizontal exit to serve as one of the required exits provided there is at least one exit stairway or exterior exit door on each side of the horizontal exit. This allows for the occupants to eventually discharge to the exterior of the building without having to pass through another horizontal exit. Obviously, horizontal exits cannot discharge directly to the exterior of the building by virtue of their design. Yet they are recognized as acceptable exits by the code.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The proposal clarifies that horizontal exits can exit into another building rather than directly to the exterior.

Assembly Action:

None

Final Hearing Results

E150-06/07

AS

Code Change No: E152-06/07

Original Proposal

Sections: 1025.1, 1025.2, 1025.3, 1025.9, 1010.2, 1012.5, 1014.3 (IFC [B]1025.1, [B]1025.2, [B]1025.3, [B]1025.9, [B]1010.2, [B]1012.5, [B]1014.3)

Proponent: Arlan Smith, Idaho Division of Building Safety, representing Idaho Association of Building Officials

Revise as follows:

1025.1 General. Occupancies in Group A and assembly occupancies accessory to Group E which contain seats, tables, displays, equipment or other material shall comply with this section.

1025.2 Assembly main exit. Group A occupancies and assembly occupancies accessory to Group E occupancies that have an occupant load of greater than 300 shall be provided with a main exit. The main exit shall be of sufficient width to accommodate not less than one-half of the occupant load, but such width shall not be less than the total required width of all means of egress leading to the exit. Where the building is classified as a Group A occupancy, the main exit shall front on at least one street or an unoccupied space of not less than 10 feet (3048 mm) in width that adjoins a street or public way.

Exception: In assembly occupancies where there is no well-defined main exit or where multiple main exits are provided, exits shall be permitted to be distributed around the perimeter of the building provided that the total width of egress is not less than 100 percent of the required width.

1025.3 Assembly other exits. In addition to having access to a main exit, each level in a Group A or assembly occupancies accessory to Group E occupancies ~~occupancy~~ having an occupant load greater than 300 shall be provided with additional means of egress that shall provide an egress capacity for at least one-half of the total occupant load served by that level and comply with Section 1015.2.

Exception: In assembly occupancies where there is no well-defined main exit or where multiple main exits are provided, exits shall be permitted to be distributed around the perimeter of the building, provided that the total width of egress is not less than 100 percent of the required width.

1025.9 Assembly aisles are required. Every occupied portion of any occupancy in Group A or assembly occupancies accessory to Group E that contains seats, tables, displays, similar fixtures or equipment shall be provided with aisles leading to exits or exit access doorways in accordance with this section. Aisle accessways for tables and seating shall comply with Section 1014.4.3.

1010.2 Slope. Ramps used as part of a means of egress shall have a running slope not steeper than one unit vertical in 12 units horizontal (8-percent slope). The slope of other pedestrian ramps shall not be steeper than one unit vertical in eight units horizontal (12.5-percent slope).

Exception: Aisle ramp slope in occupancies of Group A or assembly occupancies accessory to Group E occupancies shall comply with Section 1025.11.

1012.5 Handrail extensions. Handrails shall return to a wall, guard or the walking surface or shall be continuous to the handrail of an adjacent stair flight or ramp run. At stairways where handrails are not continuous between flights, the handrails shall extend horizontally at least 12 inches (305 mm) beyond the top riser and continue to slope for the depth of one tread beyond the bottom riser. At ramps where handrails are not continuous between runs, the handrail shall extend horizontally above the landing 12 inches (305 mm) minimum beyond the top and bottom ramps.

Exceptions:

1. Handrails within a dwelling unit that is not required to be accessible need extend only from the top riser to the bottom riser.
2. Aisle handrails in Group A and E occupancies in accordance with Section 1025.13.

1014.3 Common path of egress travel. In occupancies other than Groups H-1, H-2 and H-3, the common path of egress travel shall not exceed 75 feet (22 860 mm). In Group H-1, H-2, and H-3 occupancies, the common path of egress travel shall not exceed 25 feet (7620 mm). For common path of egress travel in Group A occupancies and assembly occupancies accessory to Group E occupancies having fixed seating, see Section 1025.8.

Exceptions:

1. The length of a common path of egress travel in Group B, F and S occupancies shall not be more than 100 feet (30 480 mm), provided that the building is equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1.
2. Where a tenant space in Group B, S and U occupancies has an occupant load of not more than 30, the length of a common path of egress travel shall not be more than 100 feet (30 480 mm).
3. The length of a common path of egress travel in a Group I-3 occupancy shall not be more than 100 feet (30 480 mm).
4. The length of a common path of egress travel in a Group R-2 occupancy shall not be more than 125 feet (38 100 mm), provided that the building is protected throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.1.

Reason: Without this change we are left with no provisions to govern assembly seating as found in school auditoriums, cafeterias and gymnasiums. These areas are not Group A Occupancies because they are specifically Group E occupancies as per IBC Section 302.2.1 and 303.1.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The proposal provides equivalent levels of egress safety for educational occupancies that may have assembly areas (e.g. cafeterias, libraries).

Assembly Action:

None

Final Hearing Results

E152-06/07

AS

Code Change No: E153-06/07

Original Proposal

Sections: 1025.4 (IFC [B] 1025.4)

Proponent: Gene Boecker, Code Consultants, Inc.

Revise as follows:

1025.4 Foyers and lobbies. In Group A-1 occupancies, where persons are admitted to the building at times when seats are not available and are allowed to wait in a lobby or similar space, provided such use of lobby or similar space shall not encroach upon the required clear width of the means of egress. ~~Such waiting areas shall be separated from the required means of egress by substantial permanent partitions or by fixed rigid railings not less than 42 inches (1067 mm) high.~~ Such foyer, if not directly connected to a public street by all the main entrances or exits, shall have a straight and unobstructed corridor or path of travel to every such main entrance or exit.

Reason: To eliminate an unnecessary code requirement from the IBC.

This provision does not address egress but the use of the space. It does not belong in the code. The only time that the separation is needed is when there is no emergency in the theater. In practice, these railed separations are unnecessary. The means of egress from a lobby must take into consideration the queuing population, making this requirement redundant.

It is a misunderstanding, therefore, to consider persons in waiting areas as potential obstructions to egress. Whether queuing or seated, these persons are occupants, and must be accommodated by the means of egress. Unfortunately, this requirement is widely interpreted to require rails or partitions, even when (as the code requires) the waiting load is already accommodated by the means of egress.

In addition, these rails or partitions can themselves constitute obstructions to egress.

As an example, a theater has 1,000 seats, 50 employees and a queuing (waiting) load of 300. This results in a total occupant load of 1,350. Egress capacity from the entire occupancy must at least equal this occupant load. More importantly to this proposal, the egress capacity of the main exit from the lobby must accommodate ½ of this load (675). The queuing load is already included in this calculation, and the egress width required to serve the queuing population as well as the theater occupants leaving the seating areas would be required by the code to be accommodated by the main exit and other exits from the occupancy.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The language should not be deleted. A separation is required for waiting areas in order to keep them from creeping into the path for means of egress.

Assembly Action:

None

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Gene Boecker, Code Consultants, Inc., requests Approval as Submitted.

Commenter's Reason: Several comments by the committee seem to indicate that the issue was not well understood. The issue raised by the committee does not validate the concern. Why is it necessary to keep the people in the waiting area from creeping into the path of egress? What is the threat or danger? There was no reason stated because there is none. All the occupants will need to egress in an emergency so the egress path will be "occupied" regardless.

The people in the waiting area and the people in the theater(s) are used to determine the total width of egress at the main entrance. It is not required to distribute the widths according to where they are located in the lobby. The entire set of doors is used for egress. If (for example) the doors are sized for 1500 people in the theater and 500 people in the waiting, the total width must be based upon 2000 occupants – regardless of where they are coming from. If a physical barrier is placed between the people waiting to egress (whether from the theaters or from the lobby) and the egress doors, people will be forced to either wait while their side egresses or climb over the barrier to reach the available egress doors. The entire main egress is designed for the 2000 occupants whether on one side or the other of the fixed barrier. If there were no barrier and people moved over to the path of egress from the theater, they would still be in queue waiting to leave. It takes the same amount of time to

egress 2000 people whether some are “within the path of egress” or not. On the other hand, with the physical barrier in place, it is possible to cause some occupants to be delayed based on which side of the barrier they chose to egress. Given a choice, people typically pick the shortest line but if they are restricted in so doing by a fixed barrier, they cannot opt for the alternate route.

It makes no sense to restrict the occupants from access to egress elements. This provision has been in one of the legacy codes but not the others; nor in the Life Safety Code®. If there is evidence of a problem with the design that has no physical barriers then that should be presented as evidence of a need for the barriers. To date, no entity has presented such evidence. It is illogical to place a restriction on egress in this manner.

The provision appears to be solely based on circulation related concerns – allowing people to leave the theater while not interfering with those waiting for the next event. If that is the case, there are no provisions within the code to determine the width, nor does that fall into the realm of life safety. Hence, it has no place within the code – it is a convenience issue.

As noted above, the fixed barrier is actually less safe than allowing a free and open area from which to select an egress path. Without substantiating data showing that this is a viable concern – and with historical evidence showing that some legacy codes (and other current codes) do not require the barrier this provision should be removed as a potential impediment to egress.

Final Hearing Results

E153-06/07
AS

Code Change No: E155-06/07

Original Proposal

Sections: 1025.5, 1025.5.1, 1020.1 (IFC [B] 1025.5, [B] 1025.5.1, [B] 1020.1)

Proponent: Tom Wandrie, ICC 300 Development Committee

Revise as follows:

1025.5 Interior balcony, ~~and gallery and press box~~ means of egress. For balconies, ~~or galleries or press boxes~~ having a seating capacity of 50 or more located in Group A occupancies, at least two means of egress shall be provided, with one from each side of every balcony, ~~or gallery or press boxes~~ and at least one leading directly to an exit.

1025.5.1 Enclosure of balcony openings. Interior stairways and other vertical openings shall be enclosed in an exit enclosure as provided in Section 1020.1, except that stairways are permitted to be open between the balcony, ~~gallery or press box~~ and the main assembly floor in occupancies such as theaters, places of religious worship, ~~and auditoriums and sports facilities~~. At least one accessible means of egress is required from a balcony, ~~or gallery or press boxes~~ level containing accessible seating locations in accordance with Section 1007.3 or 1007.4.

1020.1 Enclosures required. Interior exit stairways and interior exit ramps shall be enclosed with fire barriers constructed in accordance with Section 706 or horizontal assemblies constructed in accordance with Section 711, or both. Exit enclosures shall have a fire-resistance rating of not less than 2 hours where connecting four stories or more and not less than 1 hour where connecting less than four stories. The number of stories connected by the exit enclosure shall include any basements but not any mezzanines. An exit enclosure shall not be used for any purpose other than means of egress.

Exceptions:

1. In all occupancies, other than Group H and I occupancies, a stairway is not required to be enclosed when the stairway serves an occupant load of less than 10 and the stairway complies with either Item 1.1 or 1.2. In all cases, the maximum number of connecting open stories shall not exceed two.
 - 1.1. The stairway is open to not more than one story above the story at the level of exit discharge; or
 - 1.2. The stairway is open to not more than one story below the story at the level of exit discharge.
2. Exits in buildings of Group A-5 where all portions of the means of egress are essentially open to the outside need not be enclosed.
3. Stairways serving and contained within a single residential dwelling unit or sleeping unit in Group R-1, R-2 or R-3 occupancies are not required to be enclosed.

4. Stairways that are not a required means of egress element are not required to be enclosed where such stairways comply with Section 707.2.
5. Stairways in open parking structures that serve only the parking structure are not required to be enclosed.
6. Stairways in Group I-3 occupancies, as provided for in Section 408.3.6, are not required to be enclosed.
7. Means of egress stairways as required by Section 410.5.3 are not required to be enclosed.
8. Means of egress stairways from balconies, galleries and press boxes as provided for in Section 1025.5.1, are not required to be enclosed.
- 8- 9. In other than Group H and I occupancies, a maximum of 50 percent of egress stairways serving one adjacent floor are not required to be enclosed, provided at least two means of egress are provided from both floors served by the unenclosed stairways. Any two such interconnected floors shall not be open to other floors. Unenclosed exit stairways shall be remotely located as required in Section 1015.2.
- 9- 10. In other than Group H and I occupancies, interior egress stairways serving only the first and second stories of a building equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 are not required to be enclosed, provided at least two means of egress are provided from both floors served by the unenclosed stairways. Such interconnected stories shall not be open to other stories. Unenclosed exit stairways shall be remotely located as required in Section 1015.2.

Reason: The intent of this proposal is to clarify when press boxes can use a single means of egress. Open stairways are permitted between the press box and the main floor or ground similar to balconies. Changes to Section 1020.1 are for coordination only. If the committee decision is that press boxes do not need to be included, the exception for open exit stairways at balconies and galleries should still be referenced in Section 1020.1.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: While the committee agreed with the intent of the proposal, there can be a great diversity in what might be considered a press box. A definition for press boxes is needed in order to define where this special means of egress would be permitted. It should be clarified if the occupant load would be determined for each room in a press box or the whole level. Press boxes are addressed in IBC 903, 1025 and 1104.

Assembly Action:

None

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Tom Wandrie, ICC 300 Development Committee, requests Approval as Submitted.

Commenter's Reason: The reason "Press Boxes" were included in our proposed revision was to be certain they would be regulated under the IBC and not the ICC 300 standard. A press box is simply a space which is very similar to a balcony or gallery (both of which are not defined in the IBC). The press box is typically partially or fully enclosed for sound proofing purposes. If fully enclosed, at least one side facing the playing area is glazed. Therefore a fire in the press box would be noticed, similar to a balcony, gallery, or mezzanine. IBC sections 903, 1025, and 1104 already identify press boxes as accessory use areas, and provide sprinkler thresholds and accessible route requirements. We believe it makes the most sense to include press boxes with balconies and galleries in the IBC sections identified in this change proposal. These changes would clearly identify that; a seating capacity of 50 or more requires at least two exits and when exit enclosures are required.

Final Hearing Results

E155-06/07

AS

Code Change No: E158-06/07

Original Proposal

Sections: 1025.10 (IFC [B] 1025.10)

Proponent: Ed Roether, HOK SVE

Add new text as follows:

1025.10 Clear width of aisle accessways serving seating. Where seating rows have 14 or fewer seats, the minimum clear aisle accessway width shall not be less than 12 inches (305 mm) measured as the clear horizontal distance from the back of the row ahead and the nearest projection of the row behind. Where chairs have automatic or self-rising seats, the measurement shall be made with seats in the raised position. Where any chair in the row does not have an automatic or self-rising seat, the measurements shall be made with the seat in the down position. For seats with folding tablet arms, row spacing shall be determined with the tablet arm ~~down~~ in the used position.

Exception: For seats with folding tablet arms, row spacing is permitted to be determined with the tablet arm in the stored position where the tablet arm when raised manually to vertical position in one motion automatically returns to the stored position by force of gravity.

Reason: The current language is not clear if the arm is in the used position or folded down on the side. Means of egress should be evaluated using the most conservative approach for aisle accessway width.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: Seats with folding tablets are a common condition that occurs in many higher education lecture halls. The proposal provides specific criteria to maintain the aisle accessways where tablets are used.

Assembly Action:

None

Final Hearing Results

E158-06/07

AS

Code Change No: E160-06/07

Original Proposal

Sections: 1025.14.2 (IFC [B] 1025.14.2)

Proponent: Tom Wandrie, ICC 300 Development Committee

Revise as follows:

1025.14.2 Sightline-constrained guard heights. Unless subject to the requirements of Section 1025.14.3, a fascia or railing system in accordance with the guard requirements of Section 1013 and having a minimum height of 26 inches (660 mm) shall be provided where the floor or footboard elevation is more than 30 inches (762 mm) above

CODE CHANGES RESOURCE COLLECTION – INTERNATIONAL BUILDING CODE

the floor or grade below and the fascia or railing would otherwise interfere with the sightlines of immediately adjacent seating. At bleachers, a guard must be provided ~~where the floor or footboard elevation is more than 24 inches (610 mm) above the floor or grade below and the fascia or railing would otherwise interfere with the sightlines of the immediately adjacent seating~~ where required by ICC 300.

Reason: Code change E73-02 which added this language into the IBC was approved as a coordination item with ICC 300. This 24" drop off requirement is not in the ICC 300 Section 408.1 which deals with guards.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The proposal will coordinate with the ICC 300 and should be addressed in that standard.

Assembly Action:

None

Final Hearing Results

E160-06/07

AS

Code Change No: E163-06/07

Original Proposal

Chapter 35

Proponent: Tom Wandrie, ICC 300 Development Committee

Revise standard as follows:

ICC

ICC 300 – ~~02~~ 06 Standard on Bleachers, Folding and Telescopic Seating and Grandstands

Reason: The work plan for the bleacher standard should result in a completed document before the September hearings.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The proposal was disapproved because although the development of the 2006 edition is complete, the standard is not yet printed and generally available.

Assembly Action:

None

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Tom Wandrie, ICC 300 Development Committee, requests Approval as Submitted.

Commenter's Reason: The committee disapproved this proposal because while the final draft for the 2007 edition off ICC 300 was available, the document was not available for sale. The ICC 300, 2007 edition will be published and available for sale before the Final Action Hearings in 2007.

Final Hearing Results

E163-06/07

AS

Code Change No: E164-06/07

Original Proposal

Chapter 35

Proponent: Standards writing organizations as listed below.

Revise standards as follows:

BHMA	Builders Hardware Manufacturers Association 355 Lexington Avenue, 17 th Floor New York, NY 10017-6603
Standard reference number	Title
A 156.10-2005 4999	Power Operated Pedestrian Doors
NFPA	National Fire Protection Association 1 Batterymarch Park Quincy, MA 02269-9101
Standard reference number	Title
101-06 03	Life Safety Code

Reason: The *ICC Code Development Process for the International Codes* (Procedures) Section 4.5* requires the updating of referenced standards to be accomplished administratively, and be processed as a Code Proposal. In May 2005, a letter was sent to each developer of standards that are referenced in the I-Codes, asking them to provide ICC with a list of their standards in order to update to the current edition. Above is the list received of the referenced standards under the maintenance responsibility of the IBC Means of Egress Committee.

* **4.5 Updating Standards:** The updating of standards referenced by the Codes shall be accomplished administratively by the appropriate code development committee in accordance with these full procedures except that multiple standards to be updated may be included in a single proposal.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The latest editions of BMHA A156.10 and NFPA 101 were approved for inclusion in the referenced standards.

Assembly Action:

None

Final Hearing Results

E164-06/07

AS

Code Change No: **E165-06/07**

Original Proposal

Section: 1103.2.3

Proponent: Ed Roether, HOK SVE

Revise as follows:

1103.2.3 Employee work areas. Spaces and elements within employee work areas shall only be required to comply with Sections 907.9.1.2, 1007 and 1104.3.1 and shall be designed and constructed so that individuals with disabilities can approach, enter and exit the work area. Work areas, or portions of work areas, other than raised courtroom stations, that are less than 450 300 square feet (44 30 m²) in area and elevated 7 inches (178 mm) or more above the ground or finish floor where the elevation is essential to the function of the space shall be exempt from all requirements.

Reason: The purpose of this proposed change is twofold, first to clarify that raised courtroom stations are to be accessible and second to amend the allowance for the area of raised work areas in order to coordinate with ADAAG revised July 2004. Without this proposed change raised courtroom stations might typically be exempt even though it is questionable whether such elevation is essential to the function and raised platforms greater than 150 square feet but less than 300 would be required to be accessible even though they would not by ADAAG.

The question at hand is what degree of accessibility is appropriate for raised courtroom stations and raised platforms in general. ADAAG is recognized for establishing such limits. As such, the requirements of ADAAG regarding this issue should be reflected in IBC. However, ADAAG would permit the accessible route to be installed at a later date. This proposal would not given a previous action by the means of egress committee which rejected a proposal to permit courtroom stations to be “adaptable” consistent with ADAAG because of concerns regarding enforceability.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The proposal language will help small business employee areas. This is also consistent with the new ADA/ABA Accessibility Guidelines for employee work areas. The language for court rooms is addressed in E183-06/07.

Assembly Action:

None

Final Hearing Results

E165-06/07

AS

Code Change No: **E168-06/07**

Original Proposal

Section: 1103.2.14

Proponent: Bill Conner, Bill Conner Associates LLC, representing himself

Revise as follows:

1109.14 1103.2.14 Fuel-dispensing systems. Fuel-dispensing systems ~~The operable parts on fuel-dispensing devices shall comply with ICC A117.1, Section 308.2.4 or 308.3.4.~~

Reason: Technical provisions specific for accessibility for fuel dispensing systems are addressed in ICC A117.1. There is no reason to repeat the technical requirements/limitations in the IBC. As proposed, this requirement is no longer an exception (Section 1103.2, General Exceptions), so the section should be relocated to Section 1109, Other Features and Facilities. The proposed language also coordinates the provisions in the IBC with the latest ADAAG requirements.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The proposal will coordinate with the technical requirements for fuel dispensing devices in ICC A117.1-2003. Specific sections of a standard should not be referenced in the building code.

Assembly Action:

None

Final Hearing Results

E168-06/07

AS

Code Change No: E169-06/07

Original Proposal

Sections: 1104.3, 1108.2.4

Proponent: Ed Roether, HOK SVE

Revise as follows:

1104.3 Connected spaces. When a building or portion of a building is required to be accessible, an accessible route shall be provided to each portion of the building, to accessible building entrances connecting accessible pedestrian walkways and the public way.

Exception: In assembly areas with fixed seating ~~required to be accessible~~, an accessible route shall not be required to serve ~~fixed seating levels~~ where wheelchair spaces ~~or designated aisle seats required to be on an accessible route~~ are not provided.

1108.2.4 Designated aisle seats. At least 5 percent, but not less than one, of the total number of aisle seats provided shall be designated aisle seats and shall be the aisle seats located closest to accessible routes.

Exception: Designated aisle seats are not required in team or player seating serving areas of sport activity.

Reason: The purpose of this proposed change is to coordinate with the revised ADAAG issued July 2004. Designated aisle seats are not required on an accessible route by the new ADAAG. Therefore, the proposed language is necessary to coordinate with the revised ADAAG.

The applicable provision in the new ADAAG states: "At least 5 percent of the total number of aisle seats provided shall comply with 802.4 and shall be the aisle seats located closest to accessible routes." Without the proposed revisions, the designated aisle seats could be located up or down a series of steps, which would make their purpose much less effective. This proposed change would coordinate IBC with the new ADAAG.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: This proposal clarifies the limits of the exception in Section 1104.3. The proposed language in Section 1108.2.4 coordinates the location of the designated aisle seats with the new ADA/ABA Accessibility Guidelines.

Assembly Action:

None

Final Hearing Results

E169-06/07

AS

Code Change No: **E170-06/07**

Original Proposal

Section: 1104.4

Proponent: Dave Frable, U.S. General Services Administration

Revise as follows:

1104.4 Multilevel buildings and facilities. At least one accessible route shall connect each accessible level, including mezzanines, in multilevel buildings and facilities.

Exceptions:

1. An accessible route is not required to stories and mezzanines above and below accessible levels that have an aggregate area of not more than 3,000 square feet (278.7 m2). This exception shall not apply to:
 - 1.1. Multiple tenant facilities of Group M occupancies containing five or more tenant spaces;
 - 1.2. Levels containing offices of health care providers (Group B or I); or
 - 1.3. Passenger transportation facilities and airports (Group A-3 or B).
2. ~~In Group A, I, R and S occupancies,~~ levels that do not contain accessible elements or other spaces required by Section 1107 or 1108 are not required to be served by an accessible route from an accessible level.
3. In air traffic control towers, an accessible route is not required to serve the cab and the floor immediately below the cab.
4. Where a two-story building or facility has one story with an occupant load of five or fewer persons that does not contain public use space, that story shall not be required to be connected by an accessible route to the story above or below.
5. The vertical portion of the accessible route to elevated employee work stations within a courtroom is not required at the time of initial construction, provided a ramp, lift or elevator complying with ICC A117.1 can be installed without requiring reconfiguration or extension of the courtroom or extension of the electrical system.

Reason: We believe that the IBC requirements for accessible route to elevated workstations in a courtroom do not need to be more restrictive than the Federal ADA/ABA guidelines. While requiring access in a single courtroom building would be a good idea, requiring the installation of a platform lift or ramp in all courtrooms in a multi-courtroom building would be cost-prohibitive. The proposed language is consistent with the Federal ADA/ABA guidelines. Please note that the exception does not apply to elevated courtroom areas that are likely to be used by members of the public who are not employees of the court such as jury areas, attorney areas, or witness stands. In addition, GSA as well as other Federal agencies adhere to the Federal ADA/ABA guidelines and having the IBC accessibility requirements in courtrooms being more restrictive than the Federal ADA/ABA guidelines will lead to confusion among architects designing Federal Courthouses.

The revision to Exception 2 is editorial in nature. Groups A and S are addressed in Section 1108. Groups I and R are addressed in Section 1107. This exception has currently been misinterpreted as a general exception to all Group A, I, R and S occupancies, especially in jurisdictions that had exceptions for storage levels in previous accessibility requirements. A straight reference to Sections 1107 and 1108 would allow the same exception without the confusion.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Modified

Modify the proposal as follows:

1104.4 Multilevel buildings and facilities. At least one accessible route shall connect each accessible level, including mezzanines, in multilevel buildings and facilities.

Exceptions:

1. An accessible route is not required to stories and mezzanines above and below accessible levels that have an aggregate area of not more than 3,000 square feet (278.7 m²). This exception shall not apply to:
 - 1.1. Multiple tenant facilities of Group M occupancies containing five or more tenant spaces;
 - 1.2. Levels containing offices of health care providers (Group B or I); or 1.3. Passenger transportation facilities and airports (Group A-3 or B).
2. Levels that do not contain accessible elements or other spaces required by Section 1107 or 1108 are not required to be served by an accessible route from an accessible level.
3. In air traffic control towers, an accessible route is not required to serve the cab and the floor immediately below the cab.
4. Where a two-story building or facility has one story with an occupant load of five or fewer persons that does not contain public use space, that story shall not be required to be connected by an accessible route to the story above or below.
5. ~~The Vertical portion of the accessible route~~ access to elevated employee work stations within a courtroom is not required at the time of initial construction, provided a ramp, lift or elevator complying with ICC A117.1 can be installed without requiring reconfiguration or extension of the courtroom or extension of the electrical system.

Committee Reason: The IBC should include provisions for accessibility into courtrooms that are consistent with the new ADA/ABA Accessibility Guidelines. The modification to Exception 5 would be more consistent with the terminology found in the Guidelines. The proposed language in Exception 5 regarding the route has implications that are not appropriate for this section.

Assembly Action:**None**

Final Hearing Results

E170-06/07

AM

Code Change No: E173-06/07

Original Proposal

Sections: 1106.2, 1106.3, 1106.4**Proponent:** Philip Brazil, Reid Middleton, Inc., representing himself**Revise as follows:**

1106.2 Groups R-2 and R-3. At least two percent, but not less than one, of each type of parking space provided for occupancies in Groups R-2 and R-3, which are required to have Accessible, Type A or Type B dwelling or sleeping units, shall be accessible. Where parking is provided within or beneath a building, accessible parking spaces shall also be provided within or beneath the building.

1106.3 Hospital outpatient facilities. At least ten percent, but not less than one, of patient and visitor parking spaces provided to serve hospital outpatient facilities shall be accessible.

1106.4 Rehabilitation facilities and outpatient physical therapy facilities. At least twenty percent, but not less than one, of the portion of patient and visitor parking spaces serving rehabilitation facilities specializing in treating conditions that affect mobility and outpatient physical therapy facilities shall be accessible.

Reason: The purpose of this proposal is to clarify the requirements for minimum numbers of accessible parking spaces in Groups R-2 and R-3 occupancies, and at hospital outpatient, rehabilitation and outpatient physical therapy facilities. It is also being done for consistency with similar language in Sections 1106.5, 1107.5.1.1, 1107.5.2.1, 1107.5.3.1, 1107.5.5.1, 1107.6.2.1.1, 1107.6.4.1. There is the impression that a threshold of 2 percent, for example, is reached when the number of parking spaces reaches 76, which is not the intent. A second parking space is required when the number of parking spaces reaches 51.

In Section 1106.3, the phrase "but not less than one" is inserted for consistency with Sections 1106.2 and 1106.4 on accessible parking spaces, and for consistency with similar provisions in Sections 1107.5.1.1, 1107.5.2.1, 1107.5.3.1, 1107.5.5.1 and 1107.6.2.1.1. Without the added phrase, code users may conclude that an accessible parking space is not required until the number of parking spaces reaches 5.

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In Section 1106.4, the phrase “specializing in treating conditions that affect mobility” is inserted for consistency with the current ADAAG provisions. Refer to Section 208.2.2 of the 2004 ADA “Accessibility Guidelines for Buildings and Facilities.” Note that the editorial corrections to these provisions published in the Federal Register, Vol.70, No. 150 (August 5, 2005) do not affect Section 208.2.2 as published in the 2004 Guidelines.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The proposal clarifies that the numbers for parking spaces are not absolutes, but minimums. Clarifies the extent of the parking for rehabilitation facilities and is consistent with the new ADA/ABA Accessibility Guidelines.

Assembly Action:

None

Final Hearing Results

E173-06/07

AS

Code Change No: E174-06/07

Original Proposal

Section: 1106.7.4 (New)

Proponent: Linda Volpe, United Spinal Association

Add new text as follows:

1106.7.4 Mechanical access parking garages. Mechanical access parking garages shall provide at least one passenger loading zone at vehicle drop-off and vehicle pick-up areas.

Reason: Mechanical access parking garages provide services similar to valet parking arrangements, which are required to be provided with a passenger loading zone. In addition, this new requirement would coordinate IBC with Section 209.5 of ADAAG.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The proposal for valet parking at mechanical parking garages makes sense for the user and is consistent with the new ADA/ABA Guidelines.

Assembly Action:

None

Final Hearing Results

E174-06/07

AS

Code Change No: E176-06/07

Original Proposal

Table 1107.6.1.1

Proponent: Joe Reich, New York State Commission on Quality of Care and Advocacy for Persons with Disabilities; Dominic Marinelli, United Spinal Association

Revise table as follows:

**TABLE 1107.6.1.1
ACCESSIBLE DWELLING AND SLEEPING UNITS**

TOTAL NUMBER OF UNITS PROVIDED	MINIMUM REQUIRED NUMBER OF ACCESSIBLE UNITS WITHOUT ROLL-IN SHOWERS	MINIMUM REQUIRED NUMBER OF ACCESSIBLE UNITS ASSOCIATED WITH ROLL-IN SHOWERS	TOTAL NUMBER OF REQUIRED ACCESSIBLE UNITS
1 to 25	1	0	1
26 to 50	2	0	2
51 to 75	3	1	4
76 to 100	4	1	5
101 to 150	5	2	7
151 to 200	6	2	8
201 to 300	7	3	10
301 to 400	8	4	12
401 to 500	9	4	13
501 to 1,000	2% of total	1% of total	3% of total
Over 1, 001	<u>20, plus 1 for each 100, or fraction thereof, over 1000</u>	10 plus 1 for each 100, or fraction thereof, over 1,000	30 plus 2 for each 100, or fraction thereof, over 1,000

Reason: This proposed modification will clarify and ensure, that the accessible units will offer the same bathing options, as found in the standard rooms.

This change also meets the intent of the Americans with Disabilities Act Accessibility Guidelines (ADAAG) Section 9.1.4 (1) which requires these facilities to offer persons with disabilities a range of options equivalent to those available to other persons served by the facility. Finally, the modified table is identical to the ADA Draft, "Table 224.2 Guest Rooms with Mobility Features". This draft, published July 23, 2004 awaits final approval from the Department of Justice.

The current IBC Table 1107.6.1.1 uses the term "MINIMUM" when referring to the number of rooms associated with roll-in showers. Minimums can always be surpassed, thus allowing roll-in showers to be incorporated in all the accessible units. Some design professionals and hotel chains have done just that, in the belief that roll-in showers were favored by the disabled population. Nothing could be further from the truth. CHOICE and options equivalent to those available without disabilities is the basic premise found in the ADA.

Roll-in showers were never intended to replace transfer showers or tubs in accessible rooms. Once again, this is made clear under 9.1.4 (1) of ADA Title III.

In order to provide persons with disabilities a range of options equivalent to those available to other persons served by the facility,it continues.

"Factors to be considered include room size, cost, amenities provided and the number of beds."

If the standard rooms have tubs, then the accessible rooms would also have tubs, with a small percentage of rooms incorporated roll-in showers. The same would hold true if all the standard rooms had transfer showers, the accessible rooms would have transfer showers, with a small percentage of rooms having roll-in showers.

Providing roll-in showers in all the accessible rooms is problematic for persons who do not weight-bear or have poor sitting balance, yet are independent. Roll-in showers, do not provide the same protection as a 36" x 36" transfer shower stall. Roll-in showers do not have grab bars positioned to prevent a person from falling forward, as found in the transfer shower stall. Tubs provide 360° protection once seated, and is preferred by many people with mobility impairments for both security when sitting and the therapeutic relief from a warm bath.

The proposed modification of IBC Table 1107.6.1.1 provides for both roll-in showers and bathing fixtures equivalent to those offered in standard rooms be incorporated in the accessible rooms. The proposed table meets the intent of ADAAG section 9.1.4 in providing equal amenities, and is identical to the table found in the ADA draft, currently being reviewed by the Department of Justice.

Bibliography:

28 CFR Part 36 Section 9.1.4

Americans with Disabilities Act and Architectural Barriers Act Accessibility Guidelines July 23, 2004 Table 224.2 Guest Rooms with Mobility features

Cost Impact: The code change proposal will not increase the cost of construction. The bathing fixtures placed in the accessible room are the same fixtures found in the standard rooms.

Public Hearing Results

Committee Action:

Approved as Modified

Modify table heading as follows:

TABLE 1107.6.1.1
ACCESSIBLE DWELLING AND SLEEPING UNITS

TOTAL NUMBER OF UNITS PROVIDED	MINIMUM REQUIRED NUMBER OF ACCESSIBLE UNITS WITHOUT ROLL-IN SHOWERS	MINIMUM REQUIRED NUMBER OF ACCESSIBLE UNITS ASSOCIATED WITH ROLL-IN SHOWERS	TOTAL NUMBER OF REQUIRED ACCESSIBLE UNITS
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(Portions of proposal not shown remain unchanged)

Committee Reason: Adding the column would clarify that some Accessible Units should be provided with bathtubs or transfer showers to allow consumers increased options. A concern would be if the text in Section 1107.6.1.1 should be revised to clarify the options. This proposal is consistent with the new ADA/ABA Accessibility Guidelines. The title of the third column should be revised for consistency with the other titles.

Assembly Action:

None

Final Hearing Results

E176-06/07

AM

Code Change No: E181-06/07

Original Proposal

Section: 1108.2.8.1

Proponent: Ed Roether, HOK SVE

Revise as follows:

1108.2.8.1 Dining surfaces. Where dining surfaces for the consumption of food or drink are provided, at least 5 percent, but not less than one, of the ~~seating and standing spaces at the dining surfaces~~ for the seating and standing spaces shall be accessible and be distributed throughout the facility.

Reason: The purpose of this proposed change is to clarify that dining surfaces are to be accessible since the seating and standing spaces are not fixed elements. The proposed language puts the emphasis on the dining surface rather than the seating and standing spaces. Without this change the only thing required to be accessible could be the seating and standing surfaces and not their related dining surface.

There is confusion regarding which is required to be accessible. The only thing determining whether the dining area is accessible is the dining surface itself since the seating and standing spaces may not have any identifying demarcation.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The proposed language focuses on the surfaces rather than the seating and therefore clarifies the code.

Assembly Action:

None

Final Hearing Results

E181-06/07

AS

Code Change No: E182-06/07

Original Proposal

Section: 1108.2.8.1**Proponent:** Ed Roether, HOK SVE**Revise as follows:**

1108.2.8.1 Dining surfaces. Where dining surfaces for the consumption of food or drink are provided, at least 5 percent, but not less than one, of the seating and standing spaces at the dining surfaces shall be accessible, ~~and~~ be distributed throughout the facility and located on a level accessed by an accessible route.

Reason: The purpose of this proposed change is to clarify that accessible dining surfaces are not required to be located in spaces that are not required to have an accessible route. There are several limited locations where an accessible route is not required in the building code that would have dining surfaces. Not providing accessible dining surfaces in these limited locations would not diminish accessibility since these spaces are not provided an accessible route.

Specifically, Section 1108 would not require an accessible route to a mezzanine seating area, provided that the mezzanine contains less than 25 percent of the total area and the same services are provided in the accessible area. These limited applications would also not require an accessible route in the new ADAAG issued July 2004. Therefore, accessibility is not diminished regardless of how dining surfaces are provided these limited locations.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:**Approved as Submitted**

Committee Reason: The proposal clarifies that the accessible dining surfaces should be located on levels that have an accessible route to them. Dining areas can have non-accessible mezzanines.

Assembly Action:**None**

Final Hearing Results

E182-06/07**AS**

Code Change No: E183-06/07

Original Proposal

Section: 1108.4.1 (New)**Proponent:** Ed Roether, HOK SVE**1. Revise as follows:**

1108.4.1 Courtrooms. Each courtroom shall be accessible and comply with Sections 1108.4.1.1 through 1108.4.1.5.

2. Add new text as follows:

1108.4.1.1 Jury box. A wheelchair space complying with ICC A117.1 shall be provided within the jury box.

Exception: An adjacent companion seating is not required.

1108.4.1.2 Gallery seating. Wheelchair spaces complying with ICC A117.1 shall be provided in accordance with Table 1108.2.2.1. Designated aisle seats shall be provided in accordance with Section 1108.2.4.

1108.4.1.3 Assistive listening systems. An assistive listening system must be provided. Receivers shall be provided for the assistive listening system in accordance with Section 1108.2.6.1.

1108.4.1.4 Employee work stations. The judges' bench, clerks' station, bailiffs' station, deputy clerk's station, and court reporter's station shall be located on an accessible route. The vertical portion of the accessible route to elevated employee work stations within a courtroom is not required at the time of initial construction, provided a ramp, lift or elevator complying with ICC A117.1 can be installed without requiring reconfiguration or extension of the courtroom or extension of the electrical system.

1108.4.1.5 Other work stations. The litigant's and counsel stations, including the lectern, shall be accessible in accordance with ICC A117.1.

Reason: The intent of the proposal is to provide specifics to comply with the accessibility provisions for courtrooms.

Jury boxes are a unique form of fixed seating in assembly spaces and should be addressed separately. The intent is consistent with the ADA/ABA Guidelines. The exception is necessary to override the current ICC A117.1 requirement for an adjacent companion seat to all wheelchair spaces.

Gallery seating is addressed the same as any fixed seating arrangements. All courtrooms are required to have assistive listening systems. This is consistent with the ADA/ABA Guidelines.

The proposed language for employee work areas is consistent with the intent in the ADA/ABA Guidelines, Sections 231 and 808. The ADA/ABA guidelines allow for planning for the accessible route to raised employee work areas within courtrooms. In the public comment phase of the 2004/2005 code change cycle, the membership decided that there should not be a generic exception for the raised employee work stations within courtrooms (E141-04/05). While this is understandable in a single courtroom in a courthouse situation, this is an undue burden for the taxpayers when more than one courtroom of the different types (e.g., panel courtroom, jury courtroom and no jury courtroom) are provided.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Modified

Modify the proposal as follows:

1108.4.1.1 Jury box. A wheelchair space complying with ICC A117.1 shall be provided within the jury box.

Exception: ~~An~~ Adjacent companion seating is not required.

1108.4.1.4 Employee work stations. The judges- bench, clerks- station, bailiffs- station, deputy clerk-s station, and court reporter-s station shall be located on an accessible route. The vertical ~~portion of the accessible route~~ access to elevated employee work stations within a courtroom is not required at the time of initial construction, provided a ramp, lift or elevator complying with ICC A117.1 can be installed without requiring reconfiguration or extension of the courtroom or extension of the electrical system.

(Portions of proposal not shown remain unchanged)

Committee Reason: This proposal would be consistent with the change made to employee work stations in E165-06/07. The new provisions indicate the level of accessibility required in courtrooms. The modification is for consistency with the modification made to similar language in E170-06/07.

Assembly Action:

None

Final Hearing Results

E183-06/07

AM

Code Change No: E185-06/07

Original Proposal

Sections: 1109.2.1 through 1109.2.1.7, [P] 2902.1.1 (IPC 403.1.1), 3409.8.9 (IEBC [B] 308.8.9, 605.1.9), 3409.9.4 (IEBC [B] 308.9.4, 1104.1.4)

Proponent: David Viola, Plumbing Manufacturers Institute

Revise as follows:

1109.2.1 ~~Unisex~~ Family or assisted-use toilet and bathing rooms. In assembly and mercantile occupancies, an accessible ~~unisex family or assisted-use~~ toilet room shall be provided where an aggregate of six or more male and female water closets is required. In buildings of mixed occupancy, only those water closets required for the assembly or mercantile occupancy shall be used to determine the ~~unisex family or assisted-use~~ toilet room requirement. In recreational facilities where separate-sex bathing rooms are provided, an accessible ~~unisex family or assisted-use~~ bathing room shall be provided. Fixtures located within ~~unisex family or assisted-use~~ toilet and bathing rooms shall be included in determining the number of fixtures provided in an occupancy.

Exception: Where each separate-sex bathing room has only one shower or bathtub fixture, a ~~unisex family or assisted-use~~ bathing room is not required.

1109.2.1.1 Standard. ~~Unisex Family or assisted-use~~ toilet and bathing rooms shall comply with Sections 1109.2.1.2 through 1109.2.1.7 and ICC A117.1.

1109.2.1.2 ~~Unisex~~ Family or assisted-use toilet rooms. ~~Unisex Family or assisted-use~~ toilet rooms shall include only one water closet and only one lavatory. A ~~unisex family or assisted-use~~ bathing room in accordance with Section 1109.2.1.3 shall be considered a ~~unisex family or assisted-use~~ toilet room.

Exception: A urinal is permitted to be provided in addition to the water closet in a ~~unisex family or assisted-use~~ toilet room.

1109.2.1.3 ~~Unisex~~ Family or assisted-use bathing rooms. ~~Unisex Family or assisted-use~~ bathing rooms shall include only one shower or bathtub fixture. ~~Unisex Family or assisted-use~~ bathing rooms shall also include one water closet and one lavatory. Where storage facilities are provided for separate-sex bathing rooms, accessible storage facilities shall be provided for ~~unisex family or assisted-use~~ bathing rooms.

1109.2.1.4 Location. ~~Unisex Family or assisted-use~~ toilet and bathing rooms shall be located on an accessible route. ~~Unisex Family or assisted-use~~ toilet rooms shall be located not more than one story above or below separate-sex toilet rooms. The accessible route from any separate-sex toilet room to a ~~unisex family or assisted-use~~ toilet room shall not exceed 500 feet (152 m).

1109.2.1.5 Prohibited location. In passenger transportation facilities and airports, the accessible route from separate-sex toilet rooms to a ~~unisex family or assisted-use~~ toilet room shall not pass through security checkpoints.

1109.2.1.6 Clear floor space. Where doors swing into a ~~unisex family or assisted-use~~ toilet or bathing room, a clear floor space not less than 30 inches by 48 inches (762 mm by 1219 mm) shall be provided, within the room, beyond the area of the door swing.

1109.2.1.7 Privacy. Doors to ~~unisex family or assisted-use~~ toilet and bathing rooms shall be securable from within the room.

[P] 2902.1.1 (IPC 403.1.1) ~~Unisex~~ Family or assisted-use toilet and bath fixtures. Fixtures located within ~~unisex family or assisted-use~~ toilet bathing rooms complying with Section 1109.2.1 404 of the ~~International Plumbing Code~~ are permitted to be included in determining the minimum required number of fixtures for assembly and mercantile occupancies.

3409.8.9 (IEBC [B]308.8.9, 605.1.9) Toilet rooms. Where it is technically infeasible to alter existing toilet and bathing facilities to be accessible, an accessible ~~unisex~~ family or assisted-use toilet or bathing facility constructed in accordance with Section 1109.2.1 is permitted. The ~~unisex~~ family or assisted-use facility shall be located on the same floor and in the same area as the existing facilities.

3409.9.4 (IEBC [B]308.9.4, 1104.1.4) Toilet and bathing facilities. Where toilet rooms are provided, at least one accessible family or assisted-use toilet room complying with Section 1109.2.1 shall be provided.

Reason: The “unisex” room required in large mercantile and assembly spaces by IBC Section 1109.2.1 is confused with the unisex toilet room permitted in tenants with fewer than 15 occupants as permitted by the IPC. The change in the name to ‘Family’ or ‘Assisted Use’ will make the original intent for this facility clear. A reference to Section 1109.2.1 of the IBC in the plumbing and existing building sections will clarify what toilet/bathing room requirements are expected within this room.

In addition, the new ADA uses the term “Unisex/Single-Use or Family” differently than IBC. The new ADA refers to toilet rooms with two water closets or a water closet and a urinal as a ‘unisex’ toilet room. The change in terminology should keep them separated.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: The action on the proposed change to Sections 2902.1.1, 3409.8.9 and 3409.9.4 (as well as the associated IPC and IEBC) is dependent on the decision of the Means of Egress Committee to the remainder of the proposal, therefore, for consistency, the MEO Committee will make the determination for these section instead of the General, IPC and IEBC Committees.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The change in the language from >Unisex= to >Family or assisted use= will clarify the intent of these bathrooms (required in large mercantile and assembly facilities) is to serve anyone that needs assistance and is traveling with an opposite sex attendant. It is recommended that there should be a public comment to address the travel distance concerns between the 500' travel distance in Section 1109.2.1.5 and the >same area= language in Section 3409.8.9.

Assembly Action:

None

Final Hearing Results

E185-06/07

AS

Code Change No: E187-06/07

Original Proposal

Section: 1109.10

Proponent: Ed Roether, HOK SVE

Delete without substitution:

1109.10 Assembly area seating. ~~Assembly areas with fixed seating shall comply with Section 1108.2 for accessible seating and assistive listening devices.~~

Reason: This section is redundant and is unnecessary. It should be removed. Section 1108.2 already covers any assembly seating with fixed seats.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The proposal deletes redundant language in the code.

Assembly Action:

None

Final Hearing Results

E187-06/07

AS

Code Change No: **E188-06/07**

Original Proposal

Section: 1109.11.1

Proponent: Ed Roether, HOK SVE

Revise as follows:

1109.11.1 Dispersion. Accessible fixed or built-in seating at tables, counters or work surfaces shall be distributed throughout the space or facility containing such elements and located on a level accessed by an accessible route.

Reason: The purpose of this proposed change is to clarify that accessible tables, counters or work surfaces are not required to be located in spaces that are not required to have an accessible route. There are several limited locations where an accessible route is not required in the building code that would have tables, counters or work surfaces. Not providing accessible tables, counters or work surfaces in these limited locations would not diminish accessibility since these spaces are not provided an accessible route.

Specifically, Section 1108 would not require an accessible route to a mezzanine seating area, provided that the mezzanine contains less than 25 percent of the total area and the same services are provided in the accessible area. There are other similar limited applications where an accessible route is not required yet could have tables, counters or work surfaces, such as the cab in an air traffic control tower. These limited applications would also not require an accessible route in the new ADAAG issued July 2004. Therefore, accessibility is not diminished regardless of how tables, counters or work surfaces are provided these limited locations.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The proposed language would clarify that accessible tables and counters should be located in areas with an accessible route. This would be consistent with E182-06/07.

Assembly Action:

None

Final Hearing Results

E188-06/07

AS

Code Change No: E190-06/07

Original Proposal

Section: 1109.13.1

Proponent: Tim Pate, City and County of Broomfield, Colorado Building Department, representing himself

Revise as follows:

1109.13.1 Operable windows. Where operable windows are provided in rooms that are required to be accessible in accordance with Sections 1107.5.1.1, 1107.5.2.1, 1107.5.3.1, 1107.5.4, 1107.6.1.1, 1107.6.2.1.1, 1107.6.2.2.1, and 1107.7.6.4.1, at least one window in each room shall be accessible and each required operable window shall be accessible.

Exception: Accessible windows are not required in bathrooms and kitchens.

Reason: The ICC Code Correlating Committee added all the individual section numbers to Section 1109.13.1 and failed to include Section 1107.6.2.1.1. IBC Section 1107.6.2.1 requires that all apartment houses, monasteries, and convents have the minimum number of Type A units as listed in this section. The IBC then requires all Type A units to be constructed as per ICC A117.1. The 2003 edition of ICC A117.1, Section 1003.13 requires that "Where operable windows are provided, at least one window in each sleeping, living, or dining space shall have operable parts complying with Section 1003.9." The intent of the IBC is to tell us when things need to be accessible and the ICC A117.1 Standard is to be used to tell us how to build things to be accessible. Therefore adding Section 1107.6.2.1.1 to Section 1109.13.1 would help reduce any confusion as to when operable windows would need to be accessible.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The addition of Type A units into the list for accessible windows would be consistent with ICC A117.1.

Assembly Action:

None

Final Hearing Results

E190-06/07

AS

IBC – STRUCTURAL

Code Change No: **S1-06/07**

Original Proposal

Table 1604.5

Proponent: Philip Brazil, P.E., Reid Middleton, Inc., representing himself

Revise table as follows:

**TABLE 1604.5
OCCUPANCY CATEGORY OF BUILDINGS AND OTHER STRUCTURES**

OCCUPANCY CATEGORY	NATURE OF OCCUPANCY
I	Buildings and other structures that represent a low hazard to human life in the event of failure, including but not limited to: <ul style="list-style-type: none"> • Agricultural facilities. • Certain temporary facilities. • Minor storage facilities.
II	Buildings and other structures except those listed in Occupancy Categories I, III and IV
III	Buildings and other structures that represent a substantial hazard to human life in the event of failure, including but not limited to: <ul style="list-style-type: none"> • Covered structures whose primary occupancy is public assembly with an occupant load greater than 300. • Buildings and other structures with <u>containing</u> elementary school, secondary school or day care facilities with an occupant load greater than 250. • Buildings and other structures with an occupant load greater than 500 for <u>containing adult education facilities, such as colleges or adult education facilities and universities, with an occupant load greater than 500.</u> • Health care facilities <u>Group I-2 occupancies</u> with an occupant load of 50 or more resident patients, but not having surgery or emergency treatment facilities. • Jails and detention facilities <u>Group I-3 occupancies.</u> • Any other occupancy with an occupant load greater than 5,000. • Power-generating stations, water treatment for potable water, waste water treatment facilities and other public utility facilities not included in Occupancy Category IV. • Buildings and other structures not included in Occupancy Category IV containing sufficient quantities of toxic or explosive substances to be dangerous to the public if released.
IV	Buildings and other structures designated as essential facilities, including but not limited to: <ul style="list-style-type: none"> • Hospitals and other health care facilities <u>Group I-2 occupancies</u> having surgery or emergency treatment facilities. • Fire, rescue and police stations and emergency vehicle garages. • Designated earthquake, hurricane or other emergency shelters. • Designated emergency preparedness, communications, and operations centers and other facilities required for emergency response. • Power-generating stations and other public utility facilities required as emergency backup facilities for Occupancy Category IV structures. • Structures containing highly toxic materials as defined by Section 307 where the quantity of the material exceeds the maximum allowable quantities of Table 307.1(2). • Aviation control towers, air traffic control centers and emergency aircraft hangars. • Buildings and other structures having critical national defense functions. • Water treatment facilities required to maintain water pressure for fire suppression.

CODE CHANGES RESOURCE COLLECTION – INTERNATIONAL BUILDING CODE

Reason: The purpose of this proposal is to align the structural occupancy categories in Table 1604.5 more closely with the nonstructural occupancy classifications elsewhere in the IBC. Under Occupancy Category III, jails and detention facilities are currently listed. Section 308.4 for Group I-3 occupancies, however, also lists prisons, reformatories, correctional centers and prerelease centers as Group I-3 occupancies.

Also, under Occupancy Category III, health care facilities with an occupant load of 50 or more resident patients but not having surgery or emergency treatment facilities are currently listed. Instead of health care facilities, Section 308.3 for Group I-2 occupancies lists hospitals, nursing homes, mental hospitals and detoxification facilities as Group I-2 occupancies. It is conceivable that any of these facilities could provide services for 50 or more resident patients without having surgery or emergency treatment facilities. Similarly under Occupancy Category IV, hospitals and health care facilities having surgery or emergency treatment facilities are currently listed.

In all the cases illustrated above, the absence from Table 1604.5 of the uses listed in the occupancy classifications of Sections 308.3 and 308.4 for Groups I-2 and I-3 occupancies, respectively, may lead code users to conclude that such uses are exempt from the requirements for a higher occupancy category.

The change from health care facilities to Group I-2 occupancies is also intended to avoid classification of a building or structure as Occupancy Category III where it is not warranted. The higher classification is intended to apply to buildings and other structures that represent a substantial hazard to human life in the event of a failure. This is the case for buildings where large numbers of children or adults congregate in one area (e.g., assembly rooms, day care facilities, elementary and secondary schools, etc.). It is also the case for Group I-2 occupancies with resident patients receiving treatment other than surgery or emergency treatment (see Occupancy Category IV).

A health care facility with resident patients, however, could be perceived by some as applying to Group I-1 occupancies. These occupancies provide personal care (i.e., not health care) services to residents (i.e., not patients) in a supervised residential environment. The residents seek the services of a Group I-1 occupancy because of age, mental disability and other reasons but they are assumed to not require chronic or convalescent medical or nursing care. They are also assumed to be capable of responding to an emergency situation without physical assistance from staff.

These occupancies do not represent a substantial hazard to human life.

A change from “colleges or adult education facilities” with an occupant load greater than 500 to “adult education facilities, including colleges and universities” is intended to clarify that the higher level of structural performance associated with Occupancy Category III is warranted at facilities for adult education with high occupant loads. Such facilities can be located at universities as well as colleges, and at facilities not traditionally referred to universities or colleges. The revision will also reduce the possibility of a code user concluding that Occupancy Category III is required at buildings on college and university campuses that do not contain facilities for adult education with high occupant loads, which is not the intent.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: Agreement with the proponent-s reason which indicates that the proposal provides editorial cleanup as well as important coordination with the occupancy classifications in Chapter 3 of the IBC.

Assembly Action:

None

Final Hearing Results

S1-06/07

AS

Code Change No: **S3-06/07**

Original Proposal

Table 1604.5

Proponent: Edwin T. Huston, Smith & Huston Inc., representing National Council of Structural Engineering Associations

Revise table as follows:

**TABLE 1604.5
OCCUPANCY CATEGORY OF BUILDINGS AND OTHER STRUCTURES**

OCCUPANCY CATEGORY	NATURE OF OCCUPANCY
I	Buildings and other structures that represent a low hazard to human life in the event of failure, including but not limited to: <ul style="list-style-type: none"> • Agricultural facilities. • Certain temporary facilities. • Minor storage facilities.
II	Buildings and other structures except those listed in Occupancy Categories I, III and IV
III	Buildings and other structures that represent a substantial hazard to human life in the event of failure, including but not limited to: <ul style="list-style-type: none"> • Covered Buildings and other structures whose primary occupancy is public assembly with an occupant load greater than 300. • Buildings and other structures with elementary school, secondary school or day care facilities with an occupant load greater than 250. • Buildings and other structures with an occupant load greater than 500 for colleges or adult education facilities. • Health care facilities with an occupant load of 50 or more resident patients, but not having surgery or emergency treatment facilities. • Jails and detention facilities. • Any other occupancy with an occupant load greater than 5,000. • Power-generating stations, water treatment for potable water, waste water treatment <u>facilities</u> and other public utility facilities not included in Occupancy Category IV. • Buildings and other structures not included in Occupancy Category IV containing sufficient quantities of toxic or explosive substances to be dangerous to the public if released.
IV	Buildings and other structures designated as essential facilities, including but not limited to: <ul style="list-style-type: none"> • Hospitals and other health care facilities having surgery or emergency treatment facilities. • Fire, rescue, <u>ambulance</u> and police stations and emergency vehicle garages. • Designated earthquake, hurricane or other emergency shelters. • Designated emergency preparedness, communication, and operation centers and other facilities required for emergency response. • Power-generating stations and other public utility facilities required as emergency backup facilities for Occupancy Category IV structures. • Structures containing highly toxic materials as defined by Section 307 where the quantity of the material exceeds the maximum allowable quantities of Table 307.1.(2). • Aviation control towers, air traffic control centers and emergency aircraft hangars. • Buildings and other structures having critical national defense functions. • Water treatment <u>storage</u> facilities <u>and pump structures</u> required to maintain water pressure for fire suppression.

CODE CHANGES RESOURCE COLLECTION – INTERNATIONAL BUILDING CODE

Reason: Substitute revised material for current provision of the Code.

The purpose of the proposal is to align IBC Table 1604.5 more closely with corresponding Table 1-1 of ASCE 7-05, which contains certain terms not included in Table 1604.5. Their absence from Table 1604.5 may lead code users to conclude that the uses stipulated in Table 1-1 of ASCE 7-05 for a higher occupancy category are exempt from the same requirement in the IBC due to their absence in Table 1604.5.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Errata: Under Occupancy Category III, change the seventh bulleted item to read as follows:

Power-generating stations, water treatment facilities for potable water, waste water treatment facilities and other public utility facilities not included in Occupancy Category IV.

Committee Action:

Approved as Submitted

Committee Reason: The proposal makes a minor change in the wording of the Occupancy Category table to provide agreement with the ASCE 7 load standard.

Assembly Action:

None

Final Hearing Results

S3-06/07

AS

Code Change No: S4-06/07

Original Proposal

Table 1604.5

Proponent: Thomas Kinsman, T.A. Kinsman Consulting Company

1. Revise table as follows:

**TABLE 1604.5
OCCUPANCY CATEGORY OF BUILDINGS AND OTHER STRUCTURES**

OCCUPANCY CATEGORY	NATURE OF OCCUPANCY
III	Buildings and other structures that represent a substantial hazard to human life in the event of failure including, but not limited to: <ul style="list-style-type: none"> • Covered Buildings and other structures whose primary occupancy is public assembly <u>Group A1, A2, A3, or A4</u> with an occupant load greater than 300 • Buildings and other structures with containing <u>Group E occupancies elementary school, secondary school or day care facilities</u> with an occupant load of greater than 250 • Buildings and other structures containing <u>Group B educational facilities</u> with an occupant load of greater than 500 for colleges or adult education • <u>Buildings and other structures containing Group I-2 Hhealthcare facilities which provide care on a 24 hour basis for more than with an occupant load of 50 or more resident patients but which do not having contain surgery or emergency treatment facilities</u> • <u>Buildings and other structures containing Group I-3 Jails and detention facilities</u> • <u>Buildings and other structures containing an occupancy, other than those listed above, Any other occupancy</u> with an occupant load of greater than 5000 • Power-generating stations, water treatment for potable water, waste water treatment facilities and other public utility facilities not included in Category IV • Buildings and other structures not included in Category IV containing sufficient quantities of toxic or explosive substances to be dangerous to the public if released

(Portions of table not shown do not change)

2.

**TABLE 1604.5
OCCUPANCY CATEGORY OF BUILDINGS AND OTHER STRUCTURES**

OCCUPANCY CATEGORY	NATURE OF OCCUPANCY
III	Buildings and other structures that represent a substantial hazard to human life in the event of failure including, but not limited to: <ul style="list-style-type: none"> • Any other occupancy with an occupant load of greater than 5000^a

(Portions of table not shown do not change)

a. For purposes of occupant load calculation, occupancies required by Table 1004.1.1 to use gross floor area calculations shall be permitted to use net areas to determine the total occupant load.

Reason: The intent of the code change is two fold: improve clarity and specificity of the Category III terms, and to provide some reasonable adjustment in the threshold relating to an occupant load of 5000 in any one occupancy.

In order to determine occupant loads, the user is forced to use methods outlined in Section 1004. There is no clear rationale that connects occupant loads used to calculate minimum means of egress standards to risks associated with structural design standards. This is particularly the case for the 5000 threshold trigger in multi-story high-rise buildings.

Chapter 10 sets forth standards that provide a reasonably conservative number of occupants for all spaces, and while actual loads are commonly less than the design amount, it is not unusual in the life of a space in a building to have periods when high actual occupant loads exist. From a whole building perspective in multistory building, Chapter 10 does not require the occupant load of the whole building to be determined; rather the egress design is determined on a floor to floor basis with the floor containing the largest design occupant load controlling the design from that floor to grade.

Table 1604.5 requires that the total occupant load of an occupancy be calculated in a building – if the occupancy is spread over 30 stories, then all 30 stories are added. Based on Chapter 10, this assumes a maximum occupant load on every floor, and may result in an excessive assumption.

It seems that some method similar to live load reductions would be more reasonable. In the interim, the proposed footnote is suggesting a code based method that would provide a more reasonable approach for occupancies such as office, mercantile, and residential that are required to base occupant load on gross area – an area that includes corridors, stairways, elevators, closets, accessory areas, structural walls and columns, etc.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Modified

Modify proposal as follows:

**TABLE 1604.5
OCCUPANCY CATEGORY OF BUILDINGS AND OTHER STRUCTURES**

OCCUPANCY CATEGORY	NATURE OF OCCUPANCY
III	Buildings and other structures that represent a substantial hazard to human life in the event of failure including, but not limited to: <ul style="list-style-type: none"> • Covered Buildings and other structures whose primary occupancy is <u>public assembly Group A1, A2, A3, or A4</u> with an occupant load greater than 300 • Buildings and other structures <u>with containing Group E occupancies elementary school, secondary school or day care facilities</u> with an occupant load of greater than 250 • Buildings and other structures containing Group B educational facilities with an occupant load of greater than 500 <u>for colleges or adult education</u> • Buildings and other structures containing Group I-2 Healthcare facilities <u>which provide care on a 24-hour basis for more than with an occupant load of 50 or more resident patients but which do not having contain</u> surgery or emergency treatment facilities • Buildings and other structures containing Group I-3 Jails and detention facilities • Buildings and other structures containing an occupancy, other than those listed above. Any other occupancy with an occupant load of greater than 5000 • Power-generating stations, water treatment for potable water, waste water treatment facilities and other public utility facilities not included in Category IV • Buildings and other structures not included in Category IV containing sufficient quantities of toxic or explosive substances to be dangerous to the public if released

(Portions of table not shown do not change)

a. For purposes of occupant load calculation, occupancies required by Table 1004.1.1 to use gross floor area calculations shall be permitted to use net areas to determine the total occupant load.

Committee Reason: The proposal clarifies the calculation of occupant load for the purpose of Occupancy Category III determination where an occupant load exceeds 5000. The modification retains the current code text in favor of the other proposed clarifications to Occupancy Category III thresholds.

Assembly Action:

None

Final Hearing Results

S4-06/07

AM

Code Change No: S7-06/07

Original Proposal

Section: 1605.3.1.1

Proponent: Jeffrey B. Stone, American Forest & Paper Association

Revise as follows:

1605.3.1.1 Stress increases. Increases in allowable stresses specified in the appropriate material chapter or the referenced standards shall not be used with the load combinations of Section 1605.3.1, except that ~~a duration of load increases~~ shall be permitted in accordance with Chapter 23.

Reason: The change will eliminate confusion. A literal interpretation of current language would imply prohibition on the use of other increases such as the repetitive member factor, flat-use factors, size factors, etc.

Cost Impact: The code change proposal will not increase the cost of construction. This change merely clarifies the use of applicable adjustment factors contained in the NDS.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: This change clarifies the application of wood stress adjustments that are permitted when using the basic allowable stress load combinations.

Assembly Action:

None

Final Hearing Results

S7-06/07

AS

Code Change No: S8-06/07

Original Proposal

Sections: 1605.1, 1605.4

Proponent: W. Lee Shoemaker, Metal Building Manufacturers Association, Inc. (MBMA)

Revise as follows:

1605.1 General. Buildings and other structures and portions thereof shall be designed to resist the load combinations specified in Sections 1605.2 or 1605.3 and Chapters 18 through 23, and the special seismic load combinations of ~~Section 1605.4~~ Section 12.4.3.2 of ASCE 7 where required by Section 12.3.3.3 or 12.10.2.1 of ASCE 7. Applicable loads shall be considered, including both earthquake and wind, in accordance with the specified load combinations. Each load combination shall also be investigated with one or more of the variable loads set to zero.

Delete without substitution:

~~**1605.4 Special seismic load combinations.** For both allowable stress design and strength design methods where specifically required by Section 1605.1 or by Chapters 18 through 23, elements and components shall be designed to resist the forces calculated using Equation 16-22 when the effects of the seismic ground motion are additive to gravity forces and those calculated using Equation 16-23 when the effects of the seismic ground motion counteract gravity forces.~~

~~$$1.2D + f_4L + E_m \quad \text{(Equation 16-22)}$$~~

~~$$0.9D + E_m \quad \text{(Equation 16-23)}$$~~

where:

~~E_m = The maximum effect of horizontal and vertical forces as set forth in Section 12.4.3 of ASCE 7.~~

~~f_4 = 1 for floors in places of public assembly, for live loads in excess of 100 psf (4.79 kN/m²) and for parking garage live load, or = 0.5 for other live loads.~~

Reason: The purpose of this change is to remove the inconsistencies between ASCE 7 and IBC with regard to the special seismic load combinations.

There needs to be a correct set of special seismic load combinations to be used with Allowable Stress Design. The existing IBC Section 1605.4 is really only correct for strength design methods (even though it says it can be used for both).

The proposed revision invokes ASCE 7 for the special seismic load combinations, because ASCE 7 correctly has two distinct sets of load combinations – one for strength design and one for allowable stress design. Alternatively, IBC could reproduce the load combinations listed in ASCE 7, Section 12.4.3.2, but it seems better to just reference them.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: If approved, the proposal would result in a terminology difference between the IBC and ASCE 7 since that document does not use the term “special seismic load combinations.” The IBC also contains several references to Section 1605.4 which is proposed for deletion.

Public Hearing Results

Committee Action:**Approved as Modified****Modify proposal as follows:**

1605.1 General. Buildings and other structures and portions thereof shall be designed to resist the load combinations specified in Sections 1605.2 or 1605.3, 1605.3.1 or 1605.3.2 and Chapters 18 through 23, and the special seismic overstrength factor load combinations of Section 12.4.3.2 of ASCE 7 where required by Section 12.3.3.3 or 12.10.2.1 of ASCE 7. With the simplified procedure of ASCE 7 Section 12.14, the overstrength factor load combinations of Section 12.14.3.2 of ASCE 7 shall be used. Applicable loads shall be considered, including both earthquake and wind, in accordance with the specified load combinations. Each load combination shall also be investigated with one or more of the variable loads set to zero.

Committee Reason: This proposal clarifies application of the special seismic load combinations when using allowable stress design by referring to ASCE 7. The modification substitutes the ASCE 7 term “overstrength factor load combinations” for consistency with that document.

Assembly Action:**None**

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because public comments were submitted.

Public Comment 2:

Philip Brazil, P.E., S.E., Reid Middleton, Inc, representing himself, requests Approval as Modified by this public comment.

Modify proposal as follows:

1605.1 General. Buildings and other structures and portions thereof shall be designed to resist:

1. The load combinations specified in Section 1605.2, 1605.3.1 or 1605.3.2, and

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2. The load combinations specified in Chapters 18 through 23, and
3. The ~~overstrength factor~~ load combinations of ~~with overstrength factor~~ specified in Section 12.4.3.2 of ASCE 7 where required by Section 12.3.3.3 or 12.10.2.1 of ASCE 7.

With the simplified procedure of ASCE 7 Section 12.14, the overstrength factor load combinations of Section 12.14.3.2 of ASCE 7 shall be used. Applicable loads shall be considered, including both earthquake and wind, in accordance with the specified load combinations. Each load combination shall also be investigated with one or more of the variable loads set to zero.

The load combinations with overstrength factor in Section 12.4.3.2 of ASCE 7 shall be used in lieu of the following:

1. The load combinations for strength design in lieu of Equations 16-5 and 16-7 in Section 1605.2.1.
2. The load combinations for allowable stress design in lieu of Equations 16-12, 16-13 and 16-15 in Section 1605.3.1.
3. The load combinations for allowable stress design in lieu of Equations 16-20 and 16-21 in Section 1605.3.2.

Commenter's Reason: The purpose for this public comment is the same as for Public Comment #1 except it takes into account the apparent intent of the proponent that the load combinations for allowable stress design with overstrength factor in Section 12.4.3.2 of ASCE 7 shall substitute for the seismic load combinations in IBC Section 1605.3.2 (Alternative ASD) as well as IBC Section 1605.3.1 (Basic ASD).

Public Comment 3:

W. Lee Shoemaker, P.E., Thomas Associates, Inc, representing Metal Building Manufacturers Association Inc, requests Approval as Modified by this public comment.

Modify proposal as follows:

1605.1 General. Buildings and other structures and portions thereof shall be designed to resist the load combinations specified in Sections 1605.2, 1605.3.1, or 1605.3.2 and Chapters 18 through 23, and the overstrength factor load combinations of Section 12.4.3.2 of ASCE 7 where required by Section 12.2.5.2, 12.3.3.3 or 12.10.2.1 of ASCE 7. With the simplified procedure of ASCE 7 Section 12.14, the overstrength factor load combinations of Section 12.14.3.2 of ASCE 7 shall be used. Applicable loads shall be considered, including both earthquake and wind, in accordance with the specified load combinations. Each load combination shall also be investigated with one or more of the variable loads set to zero.

Commenter's Reason: After the Public Hearings in Florida, it was realized that there was one additional Section in ASCE 7 where the special load combinations are referenced. For consistency and completeness, Section 12.2.5.2 should also be added as noted above.

Final Hearing Results

S8-06/07

AMPC 2, 3

Code Change No: S9-06/07

Original Proposal

Sections: 1602, 202, Table 1607.1; IRC R202, Table R 301.5

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL AND THE IRC BUILDING/ENERGY CODE DEVELOPMENT COMMITTEES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

Proponent: Jonathan C. Siu, City of Seattle, representing Washington Association of Building Officials

PART I – IBC

1. Delete definitions without substitution:

SECTION 202 DEFINITIONS

BALCONY, EXTERIOR. See Section 1602.1.

DECK. See Section 1602.1.

**SECTION 1602
DEFINITIONS AND NOTATIONS**

1602.1 Definitions. The following words and terms shall, for the purposes of this chapter, have the meanings shown herein.

~~**BALCONY, EXTERIOR.** An exterior floor projecting from and supported by a structure without additional independent supports.~~

~~**DECK.** An exterior floor supported on at least two opposing sides by an adjacent structure, and/or posts, piers or other independent supports.~~

2. Revise table as follows:

**TABLE 1607.1
MINIMUM UNIFORMLY DISTRIBUTED LIVE LOADS AND MINIMUM CONCENTRATED LIVE LOADS**

OCCUPANCY OR USE	UNIFORM (psf)	CONCENTRATED (lbs.)
4. Assembly areas and theaters Fixed seats (fastened to floor) Follow spot, projections, and control rooms Lobbies Movable seats Stages and platforms <u>Other assembly areas</u>	60 50 100 100 125 <u>100</u>	—
5. <u>Balconies (exterior) and decks^h</u> On one- and two-family residences only, and not exceeding 100 sq ft	400 60 <u>Same as occupancy served</u>	—
9. Decks	Same as occupancy served^h	—
28. Residential One- and two-family dwellings Uninhabitable attics without storage ⁱ Uninhabitable attics with storage ^{i, j, k} Habitable attics and sleeping areas All other areas except balconies and decks Hotels and multifamily dwellings Private rooms and corridors serving them Public rooms and corridors serving them	10 20 30 40 40 100	—

h. See Section 1604.8.3 for decks attached to exterior walls.

(Portions of table and footnotes not shown do not change)

PART II – IRC

1. Delete definitions without substitution:

SECTION R202

~~**[B] BALCONY, EXTERIOR.** An exterior floor projecting from and supported by a structure without additional independent supports.~~

~~**[B] DECK.** An exterior floor system supported on at least two opposing sides by an adjoining structure and/or posts, piers, or other independent supports.~~

2. Revise table as follows:

**TABLE R301.5
MINIMUM UNIFORMLY DISTRIBUTED LIVE LOADS
(in pounds per square foot)**

USE	LIVE LOAD
Balconies (exterior) and decks ^e	40
Exterior balconies	60

e. See Section R502.2.1 for decks attached to exterior walls.

(Portions of table and footnotes not shown do not change)

Reason: This proposal is one of four dealing with changing Table 1607.1, Minimum Uniformly Distributed Live Loads and Minimum Concentrated Live Loads. The main intent of all these code change proposals is to remove the illogical distinction between deck and balcony live loads. In order to do that in the code, one must determine the design live loads for these elements. However, for the purposes of these proposals, that is secondary to removing the distinction. Each of the four proposals eliminates the distinction in the same way (delete the definitions and combine the items in Table 1607.1), but each proposes a different live load. While the reasoning below focuses on the proposed changes to the IBC, the same arguments apply to the proposed changes to the IRC.

The supporting information has been broken into two parts. The first part is repeated on all four proposals, and relates to removing the distinction between balconies and decks. The second part is unique to each proposal, as it gives reasons for the particular live load being proposed.

BALCONY VS. DECK

The current situation was set up in the 1996-1997 timeframe, when two of the three legacy organizations adopted definitions for decks and balconies into their codes. The definitions were then carried forward into the IBC. This error has now been propagated from the IBC into the 2005 edition of ASCE 7, which previously did not define the terms and had different live load requirements from the IBC and legacy codes. There are several reasons, explained below, why the original change made 10 years ago was incorrect, and the distinction between balconies and decks should be eliminated.

Technical Justification: There is no engineering justification for having different live loads for different support conditions, if the use is the same. Either the loads are there, or they aren't, and changing how the element is supported doesn't change the loads. If there are inherent problems with a particular type of structure or with a particular structural material, then the solution should be dealt with on the "resistance" side by increasing the required factor of safety or through additional requirements in the materials chapters, rather than by increasing the loads.

Having participated in the debate at one of the organizations' hearings in 1996, we believe no logical or technical justification was presented to make this distinction—only that the "feeling" was that cantilevers are less redundant than supported structures, and thus, should have a higher live load requirement. Again, if this is the case (which is doubtful), then the solution should be to increase the factor of safety, rather than to increase the live load.

Redundancy: Essentially all of the balcony/deck structures we see are either cantilevered or simply-supported structures. Some engineers will argue that a cantilever is less redundant than simply-supported systems. That is, a single failure could lead to collapse. However, from an engineering standpoint as applied to these structures, a simply-supported structure has no added redundancy compared to a cantilever.

Safety Record: The safety record of cantilevers is better than decks. If simply-supported systems are more redundant than cantilevers, one would expect to see increased safety as reflected by fewer collapses. However, in a Google search for "deck/balcony/failure/collapse", we were only able to find one instance of cantilevered balconies that failed, in Australia. In contrast to that single case of a cantilevered balcony failure, there were many reports of deck failures.

With most of the reports of failures, it could not be distinguished whether the structure was cantilevered or not. However, where it could be distinguished that the failed structure was a "deck" or a "balcony" per the definitions in the code, the vast majority were "deck" failures. Usually, the deck failures occurred at the connection of the deck to the building due to incorrect or poor design (e.g., nails in withdrawal, incorrect type of joist hanger) or by deterioration of the connection components. In the reports for some cases, it was questioned whether proper permits had been obtained. In one recent case in the state of Washington, the posts supporting the structure were not connected to anything at the ground level, and they "kicked out". In the one balcony failure case, the concrete balconies apparently developed a crack at the support allowing moisture to rust the rebar. Neither of these causes of failure (poor design or deterioration) can be attributed to a lack of redundancy. It is notable that where the reports discussed loading conditions, it was to state the failures were not caused by overload conditions.

Consistency: The live loads for balconies and decks are inconsistent with all the other loads in the Live Load table (IBC Table, 1607.1, ASCE 7-05 Table 4-1), in that no other loads are based on the structural support conditions. All others are based on occupancy or use (which is the heading in the table). Logically, if cantilevers are inherently dangerous, then all other items in the table should have separate loads for cantilevers versus other support conditions.

Definitions: The definitions were inserted into the two legacy codes because the live load tables required different loads for balconies versus decks, similar to ASCE 7. Once it has been demonstrated there is not a reason to apply different loading conditions to balconies versus decks, there is no need to define the terms.

It is to be noted, however, there is not an exact match between the legacy code definitions and what appears to be the intended application in ASCE 7. Table 4-1 of earlier editions of ASCE 7 has an item for "Balconies (exterior)" (live load = 100 psf, or 60 psf for small residential balconies), and an item for "Decks (patio and roof)" (live load = "same as area served, or for the type of occupancy accommodated"). One legacy code deleted the parenthetical "patio and roof" from the "deck" item. The second retained it, but inserted the same definitions. It appears the definitions inserted into the legacy codes were in error as compared to ASCE 7, because "decks" were supposed to be patios (decks on grade?) or roof decks.

However, even if one were to redefine "balcony" and "deck" to fit with what appears to be the intent of ASCE 7, there does not appear to be justification for having different loads for them, as they will most likely be used similarly.

IBC versus ASCE 7:

Some will argue that IBC and ASCE 7 should not be different, and that it is really the province of ASCE 7 to determine appropriate live loads. In general, we agree with this philosophy, and it is our intent to submit similar proposals to the ASCE 7 process. There are two reasons why we believe ICC should act now:

1. It is our understanding that the primary reason for the deck and balcony modification to the live load table of ASCE 7-05 was so it would match the organization contained in the 2003 IBC. As stated above, this just means that errors made in legacy codes have been propagated now into ASCE 7. Therefore, if ASCE 7 has been changed once to match the IBC, there is no reason why the IBC can't lead the way again.

2. It is our understanding that the next edition of ASCE 7 is not scheduled to come out until 2010. If one assumes that ASCE 7 fixes this problem in their process in that cycle (and there is no guarantee that it will), this means it will not be until the 2012 edition of the IBC that the fix will be included in the code, which will mean it will be 2013 before many jurisdictions actually adopt the code. That is too long to be propagating this error.

DESIGN LIVE LOAD FOR BALCONIES AND DECKS:

Once the premise has been accepted that the loads should not differ based on structural support conditions, the question is, what is the appropriate design live load for these structures?

The premise behind this option is if a deck can be designed to the same load as the occupancy it serves (as the code currently allows), the same should be allowed for balconies. If the balcony/deck serves a one-family dwelling, the minimum live load will be 40 psf. If it serves a private office, the live load is 50 psf. If it is an assembly area such as a roof deck, then it can be argued that it should be designed for 100 psf. The addition proposed to the Assembly item in Table 1607.1 will clarify this requirement, as well as for other assembly areas not currently covered by the table. It is significant to note that where the reports turned up in the Google search discussed loading conditions, it was to state that the decks did not fail due to overload conditions.

The callout for Footnote h in Table 1607.2 has been moved (attached to "decks" instead of the load), since it only applies to decks.

The changes being proposed in Part II for the IRC are for consistency with the terminology used in the IBC and with the live loads in the Part I proposal.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

PART I – IBC STRUCTURAL

Committee Action:

Disapproved

Committee Reason: This code change was disapproved because the revision made by S10-06/07 was preferred.

Assembly Action:

None

PART II - IRC

Committee Action:

Approved as Submitted

Committee Reason: This change serves to eliminate the differences between balcony and deck live loads and adds needed clarity to the code language.

Assembly Action:

None

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted for Part I.

Public Comment:

Gary Ehrlich, P.E., National Association of Home Builders, requests Approval as Submitted for Part I.

Commenter's Reason: As discussed at the hearings in Orlando, there has not been substantial evidence of deck or balcony failures due to overloading of the floor joists, girders, or piers. In fact, the evidence presented by NCSEA suggests that decks and balconies only see a live load of 20 psf even in a heavily-loaded state. The documented failures have been at the deck ledger connection to the floor framing and would likely have happened regardless of the design live load for decks and balconies. This proposal would allow decks in R-3 and R-4 occupancies and IRC dwellings forced to use the IBC provisions to be designed for a 40psf live load just as they would under the IRC. This would allow an engineer to make use of design aids developed for 40psf deck live loads such as the residential ledger table being implemented in the IRC. NAHB asks for your support in approving this proposal as submitted and reversing the committee's action.

Final Hearing Results

**S9-06/07, Part I
S9-06/07, Part II**

**AS
AS**

Code Change No: S14-06/07

Original Proposal

Section: 1607.7.1.3

Proponents: Edwin T. Huston, Smith & Huston, Inc., representing National Council of Structural Engineering Associations and John V. Loscheider; P.E., Loscheider Engineering Company

Delete without substitution:

~~**1607.7.1.3 Stress increase.** Where handrails and guards are designed in accordance with the provisions for allowable stress design (working stress design) exclusively for the loads specified in Section 1607.7.1, the allowable stress for the members and their attachments are permitted to be increased by one-third.~~

Reason: To delete an outdated provision.

(Loscheider) The structural safety of handrails and guards is predominantly governed by strength. When this provision was created during the drafting of the IBC, strength-based (LRFD) material standards were neither widely used nor readily available for all materials. Furthermore, for the design of steel handrails and guards, allowable stress design (ASD) consistently provided substantially lower unfactored load capacities than LRFD, and AISC had no plans to update its ASD standard correct this situation. When the IBC was drafted, the sole purpose of the allowable stress increase for handrails and guards was to provide nominal design parity between LRFD and the much more widely used ASD.

In recent years, however, there have been several important changes in our structural codes. LRFD standards are now more commonly available, and their adoption by reference in the IBC allows designers to rationally evaluate strength-critical elements such as handrails and guards. Furthermore, AISC has finally issued updated ASD provisions, which have been adopted by reference in the 2006 IBC. AISC 360-2005 is an integrated ASD/LRFD design standard that provides consistent parity between the two design methods, so designers are no longer penalized for using ASD. In fact, for many types of members commonly used for handrails and guards, ASD now actually provides unfactored load capacities that are slightly higher than LRFD, without the use of a one-third increase. For this reason, a one-third increase for ASD is no longer appropriate, and continuing to allow its use may result in unsafe handrails and guards.

(Huston) The stress increase is no longer appropriate given the latest editions of the referenced standards that more properly coordinate allowable stress design with load and resistance factor design through a unified design process. The continued use of the one-third stress increase for handrails could lead to unconservative results.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: This proposal deleted the permitted stress increases for guards and handrails because they are no longer needed with the unified ASD/LRFD formats provided in the material standards.

Assembly Action:

None

Final Hearing Results

S14-06/07

AS

Code Change No: **S15-06/07**

Original Proposal

Sections: 1609.1.1, 3108, Chapter 35

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL AND THE IBC GENERAL CODE DEVELOPMENT COMMITTEES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

Proponent: Thomas Hoenninger, Stainless LLC, representing the TIA Subcommittee TR14.7

PART I – IBC STRUCTURAL

1. Revise as follows:

1609.1.1 Determination of wind loads. Wind loads on every building or structure shall be determined in accordance with Chapter 6 of ASCE 7. The type of opening protection required, the basic wind speed and the exposure category for a site is permitted to be determined in accordance with Section 1609 or ASCE 7. Wind shall be assumed to come from any horizontal direction and wind pressures shall be assumed to act normal to the surface considered.

Exceptions:

1. Subject to the limitations of Section 1609.1.1.1, the provisions of SBCCI SSTD 10 shall be permitted for applicable Group R-2 and R-3 buildings.
2. Subject to the limitations of Section 1609.1.1.1, residential structures using the provisions of the AF&PA WFCM.
3. Designs using NAAMM FP 1001.
4. Designs using ~~TIA/EIA-222~~ TIA-222 for antenna-supporting structures and antennas.

3108.4 Loads. Towers shall be designed to resist wind loads in accordance with ~~TIA/EIA-222~~ TIA-222. Consideration shall be given to conditions involving wind load on ice-covered sections in localities subject to sustained freezing temperatures.

2. Delete and substitute standard in Chapter 35 as follows:

~~TIA/EIA-222-F-96 Structural Standard for Antenna Supporting Structures and Antennas~~

TIA-222-G-2005 Structural Standard for Antenna Supporting Structures and Antennas

PART II – IBC GENERAL

Delete and substitute as follows:

SECTION 3108 RADIO AND TELEVISION TOWERS

~~**3108.1 General.** Subject to the provisions of Chapter 16 and the requirements of Chapter 15 governing the fire-resistance ratings of buildings for the support of roof structures, radio and television towers shall be designed and constructed as herein provided.~~

~~**3108.2 Location and access.** Towers shall be located and equipped with step bolts and ladders so as to provide ready access for inspection purposes. Guy wires or other accessories shall not cross or encroach upon any street or other public space, or over above ground electric utility lines, or encroach upon any privately owned property without written consent of the owner of the encroached upon property, space or above ground electric utility lines.~~

~~**3108.3 Construction.** Towers shall be constructed of approved corrosion resistant noncombustible material. The minimum type of construction of isolated radio towers not more than 100 feet (30 480 mm) in height shall be Type IIB.~~

~~**3108.4 Loads.** Towers shall be designed to resist wind loads in accordance with TIA/EIA-222. Consideration shall be given to conditions involving wind load on ice-covered sections in localities subject to sustained freezing temperatures.~~

~~**3108.4.1 Dead load.** Towers shall be designed for the dead load plus the ice load in regions where ice formation occurs.~~

~~**3108.4.2 Wind load.** Adequate foundations and anchorage shall be provided to resist two times the calculated wind load.~~

~~**3108.5 Grounding.** Towers shall be permanently and effectively grounded.~~

SECTION 3108
TELECOMMUNICATION AND BROADCAST TOWERS

3108.1 General. Towers shall be designed and constructed in accordance with the provisions of TIA-222.

3108.2 Location and access. Towers shall be located such that guy wires and other accessories shall not cross or encroach upon any street or other public space, or over above-ground electric utility lines, or encroach upon any privately owned property without the written consent of the owner of the encroached-upon property, space or above-ground electric utility lines. Towers shall be equipped with climbing and working facilities in compliance with TIA-222. Access to the tower sites shall be limited as required by applicable OSHA, FCC and EPA regulations.

Reason: (Part I) Revise outdated material.

TIA-222-G was published in August 2005 and was made effective January 1, 2006. It replaces TIA/EIA-222-F, which is no longer maintained or supported by the Telecommunications Industry Association (TIA). TIA-222-G is an ANSI approved standard.

The major changes from 222-F that are incorporated in 222-G are:

222-G is based on the ASCE 7-05 three-second gust basic wind speed map. 222-F is based on the ASCE 7-93 fastest mile basic wind speed map and results in confusion when comparing to the ASCE 7-05 and IBC2006.

222-G includes reliability classes for telecommunication and broadcast structures that correspond to the building and structure categories of ASCE 7-05. 222-F does not include reliability classes.

222-G incorporates the same exposure categories and provisions for topographic features as ASCE 7-05. 222-F does not include multiple exposure categories and provisions for topographic features.

222-G incorporates appropriate provisions for the latest AISC and ACI standards that pertain to telecommunication and broadcast structures.

222-G incorporates the ASCE 7-05 ice maps. 222-F does not include ice map data.

222-G contains a section for proper earthquake analysis and design for telecommunication and broadcast structures. 222-F does not include earthquake provisions.

222-G contains updated, comprehensive provisions for climbing and working facilities.

(Part II) TIA-222-G is the current standard and was published in August 2005 and was made effective January 1, 2006. This is the structural standard for antenna supporting structures and antennas and is ANSI approved. IBC2006 references TIA/EIA-222-F, which is an outdated TIA standard.

The title "Telecommunication and Broadcast Towers" was substituted for "Radio and Television towers" because TIA-222 applies to more than just radio and television towers.

Section 3108.1 was substituted because it is clearer and more concise language. Deleted the reference to Chapter 15 because it does not apply.

Section 3108.2 was substituted because it is clearer and more concise language.

Sections 3108.3, 3108.4 and 3108.5 were deleted because the language in the sections either does not apply or it is covered in TIA-222.

Cost Impact: In general, the code change proposal will not increase the cost of construction. However, some specific tower projects may experience an increase in construction cost.

Analysis: Results of review of the proposed standard(s) will be posted on the ICC website by August 20, 2006.

Public Hearing Results

Note: The following analysis was not in the Code Change Proposal book but was published in the "Errata to the 2006/2007 Proposed Changes to the International Codes and Analysis of Proposed Referenced Standards" provided at the code development hearings:

Analysis: Review of proposed standard indicated that, in the opinion of ICC staff, the standard did comply with ICC criteria for referenced standards.

PART I — IBC STRUCTURAL

Committee Action:

Approved as Submitted

Committee Reason: This code change makes an appropriate update to the latest edition of TIA-222 for antenna-supporting structures.

Assembly Action:

None

PART II — IBC GENERAL**Committee Action:**

Approved as Submitted

Committee Reason: The revision of Section 3108 as proposed correlates with what is actually being applied in the field. In addition the proposal removes non building code related issues and leaves such issues to the standard itself.

Assembly Action:

None

Final Hearing Results

S15-06/07, Part I	AS
S15-06/07, Part II	AS

Code Change No: S17-06/07

Original Proposal

Sections: 1609.1.1, 1609.1.1.2 through 1609.1.1.2.2 (New)

Proponent: T. Eric Stafford, Institute for Business and Home Safety

1. Revise as follows:

1609.1.1 Determination of wind loads. Wind loads on every building or structure shall be determined in accordance with Chapter 6 of ASCE 7. The type of opening protection required, the basic wind speed and the exposure category for a site is permitted to be determined in accordance with Section 1609 or ASCE 7. Wind shall be assumed to come from any horizontal direction and wind pressures shall be assumed to act normal to the surface considered.

Exceptions:

1. Subject to the limitations of Section 1609.1.1.1, the provisions of SBCCI SSTD 10 shall be permitted for applicable Group R-2 and R-3 buildings.
2. Subject to the limitations of Section 1609.1.1.1, residential structures using the provisions of the AF&PA WFCM.
3. Designs using NAAMM FP 1001.
4. Designs using TIA/EIA-222 for antenna-supporting structures and antennas.
5. Wind Tunnel tests in accordance with Section 6.6 of ASCE 7, subject to the limitations in Section 1609.1.1.2.

2. Add new text as follows:

1609.1.1.2 Wind tunnel test limitations. The lower limit on pressures for main wind-force resisting systems and components and cladding shall be in accordance with Sections 1609.1.1.2.1 and 1609.1.1.2.2.

1609.1.1.2.1 Lower limits on main wind-force-resisting system. Pressures determined from wind tunnel testing shall be limited to not less than 80 percent of the design pressures determined in accordance with Section 6.5 of ASCE 7, unless specific testing is performed that demonstrates it is the aerodynamic coefficient of the building, rather than shielding from other structures, that is responsible for the lower values. The 80 percent limit may be adjusted by the ratio of the frame load at critical wind directions as determined from wind tunnel testing without specific adjacent buildings, but including appropriate upwind roughness, to that determined in Section 6.5 of ASCE 7.

1609.1.1.2.2 Lower limits on components and cladding. The design pressures for components and cladding on walls or roofs shall be selected as the greater of the wind tunnel test results or 80 percent of the pressure obtained for Zone 4 for walls and Zone 1 for roofs as determined in Section 6.5 of ASCE 7, unless specific testing is performed that demonstrates it is the aerodynamic coefficient of the building, rather than shielding from nearby

structures, that is responsible for the lower values. Alternatively, limited tests at a few wind directions without specific adjacent buildings, but in the presence of an appropriate upwind roughness, shall be permitted to be used to demonstrate that the lower pressures are due to the shape of the building and not to shielding.

Reason: This code change brings forward recommendations currently in the ASCE 7-05 commentary and gives the limitations the force of code provisions. Recent comparisons between wind tunnel studies for the same building have demonstrated a difference of up to 40% in results between laboratories. These provisions will provide a limit on reductions that will provide a baseline threshold value. This is being proposed in the IBC at this time because it is our understanding that ASCE 7 will not be revised again until 2010.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Modified

Modify proposal as follows:

1609.1.1 Determination of wind loads. Wind loads on every building or structure shall be determined in accordance with Chapter 6 of ASCE 7. The type of opening protection required, the basic wind speed and the exposure category for a site is permitted to be determined in accordance with Section 1609 or ASCE 7. Wind shall be assumed to come from any horizontal direction and wind pressures shall be assumed to act normal to the surface considered.

Exceptions:

1. Subject to the limitations of Section 1609.1.1.1, the provisions of SBCCI SSTD 10 shall be permitted for applicable Group R2 and R-3 buildings.
2. Subject to the limitations of Section 1609.1.1.1, residential structures using the provisions of the AF&PA WFCM.
3. Designs using NAAMM FP 1001.
4. Designs using TIA/EIA-222 for antenna-supporting structures and antennas.
5. Wind Tunnel tests in accordance with Section 6.6 of ASCE 7, subject to the limitations in Section 1609.1.1.2.

1609.1.1.2 Wind tunnel test limitations. The lower limit on pressures for main wind-force resisting systems and components and cladding shall be in accordance with Sections 1609.1.1.2.1 and 1609.1.1.2.2.

1609.1.1.2.1 Lower limits on main wind-force-resisting system.

Pressures ~~Base overturning moments~~ determined from wind tunnel testing shall be limited to not less than 80 percent of the design ~~pressures~~ base overturning moment determined in accordance with Section 6.5 of ASCE 7, unless specific testing is performed that demonstrates it is the aerodynamic coefficient of the building, rather than shielding from other structures, that is responsible for the lower values. The 80 percent limit may be adjusted by the ratio of the frame load at critical wind directions as determined from wind tunnel testing without specific adjacent buildings, but including appropriate upwind roughness, to that determined in Section 6.5 of ASCE 7.

1609.1.1.2.2 Lower limits on components and cladding. The design pressures for components and cladding on walls or roofs shall be selected as the greater of the wind tunnel test results or 80 percent or the pressure obtained for Zone 4 for walls and Zone 1 for roofs as determined in Section 6.5 of ASCE 7, unless specific testing is performed that demonstrates it is the aerodynamic coefficient of the building, rather than shielding from nearby structures, that is responsible for the lower values. Alternatively, limited tests at a few wind directions without specific adjacent buildings, but in the presence of an appropriate upwind roughness, shall be permitted to be used to demonstrate that the lower pressures are due to the shape of the building and not to shielding.

Committee Reason: This proposal implements in the code the limitations on wind load testing that are currently noted in the commentary to ASCE 7. The modification changes wind pressure to overturning moment to address that specific requirement.

Assembly Action:

None

Final Hearing Results

S17-06/07

AM

Code Change No: **S18-06/07**

Original Proposal

Section: 1609.1.2

Proponent: Edwin T. Huston, Smith & Huston Inc., representing National Council of Structural Engineering Associations

Revise as follows:

1609.1.2 Protection of openings. In wind-borne debris regions, glazing in buildings shall be impact-resistant or protected with an impact-resistant covering meeting the requirements of an approved impact-resistant standard or ASTM E 1996 and ASTM E 1886 referenced herein as follows:

1. *Glazed openings located within 30 feet (9144 mm) of grade shall meet the requirements of the Large Missile Test of ASTM E 1996.*
2. *Glazed openings located more than 30 feet (9144 mm) above grade shall meet the provisions of the Small Missile Test of ASTM E 1996.*

Exceptions:

1. Wood structural panels with a minimum thickness of 7/16 inch (11.1 mm) and maximum panel span of 8 feet (2438 mm) shall be permitted for opening protection in one- and two-story buildings classified as Group R-3 or R-4 occupancy. Panels shall be precut so that they shall be attached to the framing surrounding the opening containing the product with the glazed opening. Panels shall be secured with the attachment hardware provided. Attachments shall be designed to resist the components and cladding loads determined in accordance with the provisions of ASCE 7. Attachment in accordance with Table 1609.1.2 is permitted for buildings with a mean roof height of 33 feet (10058 mm) or less where wind speeds do not exceed 130 mph (57.2 m/s).
2. Glazing in Occupancy Category I buildings as defined in Section 1604.5, including greenhouses that are occupied for growing plants on a production or research basis, without public access shall be permitted to be unprotected.
3. Glazing in Occupancy Category II, III or IV buildings located over 60 feet (18 288 mm) above the ground and over 30 feet (9144 mm) above aggregate surface roofs located within 1,500 feet (458 m) of the building shall be permitted to be unprotected.

Reason: Substitute revised material for current provision of the Code.

ASCE 7-98 and ASCE 7-02 require that "Glazing in the lower 60 ft. of Category II, III, or IV buildings sited in wind borne debris regions be impact resistant glazing or protected with an impact resistant covering. Alternatively, if these criteria are not met, the glazed opening must be considered to be "open" (not having any covering) if it receives positive external pressure, thus potentially changing the design of the building from an "enclosed building" to one that is "open" or "partially enclosed", depending on the size and number of openings. Generally this would mean that the interior walls would be designed for nearly the same wind pressures as the external walls. More importantly, even though the building can be designed to sustain the higher wind pressures, the interior of the building and its contents are subject to major damage from wind and wind-driven rain should the glazing be broken.

In the 2002 edition of ASCE 7, the language was changed to recognize the higher importance of certain structures. In all Category IV structures, and in Category II or III buildings used for health care, jail and detention facilities, power generating and other public utility facilities, glazing in the lower 60 ft. of the structure sited in wind borne debris regions was required to have either impact resistant glazing or be protected with an impact resistant covering, meeting the test requirements of ASTM E 1996. For glazed openings less than 30 feet above the ground, the Large Missile Test requirements apply. For Category II or III buildings with uses other than those enumerated above, openings in the lower 60 feet of the building could be left unprotected, provided that an unprotected opening that received positive external pressure was considered an opening for purposes of determining the building's enclosure classification.

ASCE 7-05 has been further changed to require glazing in all Category II, III or IV buildings to be impact-resistant glazing or protected with an impact-resistant covering if it is located as follows: in the lower 60 feet of the building, and equal to or less than 30 feet above an aggregate surfaced roof within 1500 feet of the building. The provision of ASCE 7-02 that permitted the glazed opening to be considered an opening for purposes of determining the enclosure classification of the building has been removed.

During the development of the IBC 2000 when the provisions of ASCE 7-98 were being considered, the home building industry successfully lobbied for an exception that allowed any one- or two-story building, regardless of Occupancy Category, to be constructed with neither non-impact resistant glazing nor a non-impact resistant covering provided the non-impact resistant glazing is covered with 7/16" thick wood structural panels. These panels are not required to meet either the Large or Small Missile test requirements of ASTM E 1996. The attachment of the panels are required only to meet the component and cladding wind load provisions of ASCE 7, but there is no such requirement for the panels themselves.

CODE CHANGES RESOURCE COLLECTION – INTERNATIONAL BUILDING CODE

In addition, the panels are allowed to span as far as 8 ft. without any stiffeners if the panel itself cannot meet the component and cladding wind pressure provisions of ASCE 7 for the design wind speed. The only additional requirement for the panels is that they are fastened at the edges.

These wood structural panels do not afford the same level of protection as impact resistant coverings (i.e., hurricane shutters), which have met the Large Missile Impact requirements of ASTM E 1996. Further, there is no recognition of the higher importance of health care facilities, jails, public utility facilities, etc. in the IBC requirements. While the use of wood structural panels (e.g., plywood and OSB) may be adequate for the protection of openings in one- and two-family dwellings; the use of these panels, without more stringent requirements for their attachment and intervals of support, is not adequate for health care facilities, facilities where the occupants have limited mobility, and other facilities where the panels may not be installed prior to arrival of the hurricane.

For these reasons, the proposed change limits the use of the wood structural panels to Group R-3 and R-4 buildings, so that the intent of ASCE 7 to provide a higher level of protection for all other building occupancy groups is maintained.

Cost Impact: The code change proposal will increase the cost of construction

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: This code change places an appropriate limit on the prescriptive opening protection option utilizing wood structural panels by limiting their use to Groups R-3 and R-4.

Assembly Action:

None

Final Hearing Results

S18-06/07

AS

Code Change No: S19-06/07

Original Proposal

Sections: 1609.1.2, Table 1602.1.2; IRC R301.2.1.2, Table R301.2.1.2

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL AND THE IRC BUILDING/ENERGY CODE DEVELOPMENT COMMITTEES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

Proponent: T. Eric Stafford, Institute for Business and Home Safety

PART I – IBC

Revise as follows:

1609.1.2 Protection of openings. In wind-borne debris regions, glazing in buildings shall be impact-resistant or protected with an impact-resistant covering meeting the requirements of an approved impact-resisting standard or ASTM E 1996 and ASTM E 1886 referenced therein as follows:

1. Glazed openings located within 30 feet (9144 mm) of grade shall meet the requirements of the Large Missile Test of ASTM E 1996.
2. Glazed openings located more than 30 feet (9144 mm) above grade shall meet the provisions of the Small Missile Test of ASTM E 1996.

Exceptions:

1. Wood structural panels with a minimum thickness of 7/16 inch (11 mm) and a maximum span of 8 feet (2438 mm) shall be permitted for opening protection in one- and two-story buildings. Panels shall be pre-cut so that they shall be attached to the framing surrounding the opening containing the product with the

glazed opening. Panels shall be predrilled as required for the anchorage method and shall be secured with the attachment hardware provided. Attachments shall be designed to resist the component and cladding loads determined in accordance with ASCE 7, with permanent corrosion resistant attachment hardware provided and anchors permanently installed on the building. Attachment in accordance with Table 1609.1.2 with permanent corrosion resistant attachment hardware provided and anchors permanently installed on the building is permitted for buildings with a mean roof height of 33 feet (10 058 mm) or less where wind speeds do not exceed 130 miles per hour (58 m/s).

2. Glazing in Occupancy Category I buildings as defined in Section 1604.5, including greenhouses that are occupied for growing plants on a production or research basis, without public access shall be permitted to be unprotected.
3. Glazing in Occupancy Category II, III or IV buildings located over 60 feet (18 288 mm) above the ground and over 30 feet (9144 mm) above aggregate surface roofs located within 1,500 feet (458 m) of the building shall be permitted to be unprotected

TABLE 1609.1.2
WIND-BORNE DEBRIS PROTECTION FASTENING SCHEDULE
FOR WOOD STRUCTURAL PANELS^{a,b,c,d}

FASTENER TYPE	FASTENER SPACING (in.)		
	Panel span ≤ 4 foot	4 feet < panel span ≤ 6 feet	6 feet < panel span ≤ 8 feet
No. 6 Screws	16	12	9
No. 8 Wood Screw based anchor with 2-inch embedment length	16	10	8
No. 8 Screws	16	16	12
No. 10 Wood Srew based anchor with 2-inch embedment length	16	12	9
¼ Lag screw based anchor with 2-inch embedment length	16	16	16

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound = 4.448N,
1 mile per hour = 0.447 m/s.

- a. This table is based on 130 mph wind speeds and a 33-foot mean roof height.
- b. Fasteners shall be installed at opposing ends of the wood structural panel. Fasteners shall be located a minimum of 1 inch from the edge of the panel.
- c. Anchors shall penetrate through the exterior wall covering with an embedment length of 2 inches minimum into the building frame. ~~Fasteners shall be long enough to penetrate through the exterior wall covering and a minimum of 1 ¼ inches into wood wall framing and a minimum of 1 ¼ inches into concrete block or concrete, and into steel framing a minimum of 3 exposed threads.~~ Fasteners shall be located a minimum of 2 ½ inches from the edge of concrete block or concrete.
- d. Where ~~panels screws~~ are attached to masonry or masonry/stucco, they shall be attached using vibration-resistant anchors having a minimum ultimate withdrawal capacity of ~~1500~~ 490 pounds.

PART II – IRC

Revise as follows:

R301.2.1.2 Protection of openings. Windows in buildings located in windborne debris regions shall have glazed openings protected from windborne debris. Glazed opening protection for windborne debris shall meet the requirements of the Large Missile Test of an approved impact resisting standard or ASTM E 1996 and ASTM E 1886 referenced therein.

Exception: Wood structural panels with a minimum thickness of 7/16 inch (11 mm) and a maximum span of 8 feet (2438 mm) shall be permitted for opening protection in one- and two-story buildings. Panels shall be pre-cut so that they shall be attached to the framing surrounding the opening containing the product with the glazed opening. Panels shall be predrilled as required for the anchorage method and shall be secured with the attachment hardware provided. Attachments shall be designed to resist the component and cladding loads determined in accordance with either Table R301.2(2) or Section 1609.6.5 of the *International Building Code*, with permanent corrosion resistant attachment hardware provided and anchors permanently installed on the building. Attachment in accordance with Table R301.2.1.2 is permitted for buildings with a mean roof height of 33 feet (10 058 mm) or less where wind speeds do not exceed 130 miles per hour (58 m/s).

**TABLE R301.2.1.2
WIND-BORNE DEBRIS PROTECTION FASTENING SCHEDULE
FOR WOOD STRUCTURAL PANELS^{a,b,c,d}**

FASTENER TYPE	FASTENER SPACING (in.) ^{1,2}		
	Panel span ≤ 4 foot	4 feet < panel span ≤ 6 feet	6 feet < panel span ≤ 8 feet
No. 6 Screws		42	9
<u>No. 8 Wood Screw based anchor with 2-inch embedment length</u>	16	<u>10</u>	<u>8</u>
No. 8 Screws		46	42
<u>No. 10 Wood Srew based anchor with 2-inch embedment length</u>	16	<u>12</u>	<u>9</u>
<u>¼ Lag screw based anchor with 2-inch embedment length</u>	<u>16</u>	<u>16</u>	<u>16</u>

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound = 4.448N,
1 mile per hour = 0.447 m/s.

- This table is based on 130 mph wind speeds and a 33-foot mean roof height.
- Fasteners shall be installed at opposing ends of the wood structural panel. Fasteners shall be located a minimum of 1 inch from the edge of the panel.
- Anchors shall penetrate through the exterior wall covering with an embedment length of 2 inches minimum into the building frame. ~~Fasteners shall be long enough to penetrate through the exterior wall covering and a minimum of 1 ¼ inches into wood wall framing and a minimum of 1 ¼ inches into concrete block or concrete, and into steel framing a minimum of 3 exposed threads.~~ Fasteners shall be located a minimum of 2 ½ inches from the edge of concrete block or concrete.
- Where panels ~~screws~~ are attached to masonry or masonry/stucco, they shall be attached using vibration-resistant anchors having a minimum ultimate withdrawal capacity of 1500 ~~490~~ pounds.

Reason: The purpose of this code change is primarily to require permanently mounted hardware when using wood structural panel shutters for window protection for new construction. It is our belief that using wood structural panels as window protection in the manner currently prescribed by the code, is basically an emergency option for protection of existing buildings where the homeowner does not have some permanent shutter system in place.

While the code requires the panels to be precut and the attachment hardware provided, there are potentially many logistical problems with homeowners actually installing the panels as required by the code. It's not clear that the homeowners will be sufficiently instructed on (or remember at a later date) how to attach the panels, in particular using the prescribed minimum spacing. Additionally, it can be extremely cumbersome to attempt to nail a sheet of plywood over a window, particularly on the second story of a building. Additionally, we are concerned about the capacity of nailed connections where the nails are installed in the same hole repeatedly.

This proposed change also increases the minimum required capacity of masonry anchors from 490 lbs to 1500 lbs. Evaluation reports (ICC, NES, and SBCCI) for masonry anchors require a Factor of Safety (FS) of 4.0 if a special inspection is performed on the anchor installation. Without a special inspection, the reports require a FS of 8.0. Based on the load conditions specified, the 490 lb required capacity implies a FS of 2.5. We do not believe that special inspections are or will be performed on these anchors. Therefore, raising the required capacity of the masonry anchors to 1500 lbs provides a FS more in line with the evaluation reports for masonry anchors.

At the time of preparation of this proposal, the Florida Building Commission Structural Technical Advisory Committee unanimously approved this code change for the 2006 glitch amendment cycle.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing Results

PART I – IBC

Committee Action:

Approved as Modified

Modify proposal as follows:

1609.1.2 Protection of openings. In wind-borne debris regions, glazing in buildings shall be impact-resistant or protected with an impact-resistant covering meeting the requirements of an approved impact-resisting standard or ASTM E 1996 and ASTM E 1886 referenced therein as follows:

- Glazed openings located within 30 feet (9144 mm) of grade shall meet the requirements of the Large Missile Test of ASTM E 1996.
- Glazed openings located more than 30 feet (9144 mm) above grade shall meet the provisions of the Small Missile Test of ASTM E 1996.

Exceptions:

- Wood structural panels with a minimum thickness of 7/16 inch (11 mm) and a maximum span of 8 feet (2438 mm) shall be permitted for opening protection in one- and two-story buildings. Panels shall be pre-cut so that they shall be attached to the framing surrounding the opening containing the product with the glazed opening. Panels shall be predrilled as required for the anchorage method and shall be secured with the attachment hardware provided. Attachments shall be designed to resist the

- component and cladding loads determined in accordance with ASCE 7, with ~~permanent~~-corrosion resistant attachment hardware provided and anchors permanently installed on the building. Attachment in accordance with Table 1609.1.2 with ~~permanent~~ corrosion resistant attachment hardware provided and anchors permanently installed on the building is permitted for buildings with a mean roof height of ~~33 45~~ feet (40-068 mm) or less where wind speeds do not exceed ~~430 140~~ miles per hour (68 m/s).
2. Glazing in Occupancy Category I buildings as defined in Section 1604.5, including greenhouses that are occupied for growing plants on a production or research basis, without public access shall be permitted to be unprotected.
 3. Glazing in Occupancy Category II, III or IV buildings located over 60 feet (18 288 mm) above the ground and over 30 feet (9144 mm) above aggregate surface roofs located within 1,500 feet (458 m) of the building shall be permitted to be unprotected.

**TABLE 1609.1.2
WIND-BORNE DEBRIS PROTECTION FASTENING SCHEDULE
FOR WOOD STRUCTURAL PANELS^{a,b,c,d}**

FASTENER TYPE	FASTENER SPACING (in.)		
	Panel span, 4 foot	4 feet < panel span, 6 feet	6 feet < panel span, 8 feet
No. 8 Wood Screw based anchor with 2-inch embedment length	16	10	8
No. 10 Wood Screw based anchor with 2-inch embedment length	16	12	9
¼ Lag screw based anchor with 2-inch embedment length	16	16	16

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound = 4.448N,
1 mile per hour = 0.447 m/s.

- a. This table is based on ~~430 140~~ mph wind speeds and a ~~33 45~~-foot mean roof height.
- b. Fasteners shall be installed at opposing ends of the wood structural panel. Fasteners shall be located a minimum of 1 inch from the edge of the panel.
- c. Anchors shall penetrate through the exterior wall covering with an embedment length of 2 inches minimum into the building frame. ~~into wood wall framing and concrete block or concrete.~~ Fasteners shall be located a minimum of 2 ½ inches from the edge of concrete block or concrete.
- d. Where panels are attached to masonry or masonry/stucco, they shall be attached using vibration-resistant anchors having a minimum ultimate withdrawal capacity of 1500 pounds.

Committee Reason: The proposal makes clarifications to the prescriptive option for protection of glazed openings and specifically requires permanent anchorage to be provided. The modification extends the wind speed and roof height limits to be consistent with the revised fastener spacing. The word permanent immediately preceding "corrosion resistant" was also deleted to avoid confusion.

Assembly Action:

None

PART II – IRC

Committee Action:

Disapproved

Committee Reason: There was insufficient technical data to support this change. A safety factor of 8 would be excessive. If this proposal were passed it would no longer allow the use of masonry screws. In addition, the increase in cost predicted to be from 33 to 53 percent was not justified.

Assembly Action:

None

Final Hearing Results

S19-06/07, Part I
S19-06/07, Part II

AM
AS

Code Change No: S20-06/07

Original Proposal

Section: 1609.1.2.2, Chapter 35

Proponent: Joseph R. Hetzel, P.E., Door & Access Systems Manufacturers Association

1. Add new text as follows:

1609.1.2.2 Garage doors. Garage door glazed opening protection for wind-borne debris shall meet the requirements of an approved impact resisting standard or ANSI/DASMA 115.

2. Add standard to Chapter 35 as follows:

DASMA

ANSI/DASMA 115-03, Standard Method for Testing Garage Doors: Determination of Structural Performance Under Missile Impact and Cyclic Wind Pressure

Reason: The purpose of this proposed code change is to reference an ANSI standard published specifically for the windborne debris resistance testing of garage doors. ANSI/DASMA 115 should be the primary standard referenced for this purpose. Other standards exist that could be deemed “approved impact resisting standards”, including ASTM E 1886 / ASTM E 1996 and TAS 201 / TAS 203. It should be noted that ASTM E 1886 and ASTM E 1996 require interpretation regarding their use with garage doors. ASTM E6.51.17 (impact resistance task group) has not developed specific references to garage doors in those standards because of their awareness of the existence of, and industry use of, ANSI/DASMA 115.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: Results of review of the proposed standard(s) will be posted on the ICC website by August 20, 2006.

Public Hearing Results

Note: The following analysis was not in the Code Change Proposal book but was published in the “Errata to the 2006/2007 Proposed Changes to the International Codes and Analysis of Proposed Referenced Standards” provided at the code development hearings:

Analysis: Review of proposed new standard indicated that, in the opinion of ICC staff, the standard did comply with ICC criteria for referenced standards.

Committee Action:

Approved as Submitted

Committee Reason: This code change adds a needed reference standard for protection of garage door openings.

Assembly Action:

None

Final Hearing Results

S20-06/07

AS

Code Change No: S22-06/07

Original Proposal

Sections: 1612.3.1 (New), 106.2.1 (New)

Proponent: Rebecca C. Quinn, RCQuinn Consulting, Inc., representing US Dept. of Homeland Security, Federal Emergency Management Agency

Revise as follows:

1612.3 Establishment of flood hazard areas. To establish flood hazard areas, the governing body shall adopt a flood hazard map and supporting data. The flood hazard map shall include, at a minimum, areas of special flood hazard as identified by the Federal Emergency Management Agency in an engineering report entitled “The Flood Insurance Study for (insert Name of Jurisdiction),” dated (insert date of issuance), as amended or revised with the accompanying Flood Insurance Rate Map (FIRM) and Flood Boundary and Floodway Map (FBFM) and related supporting data along with any revisions thereto. The adopted flood hazard map and supporting data are hereby adopted by reference and declared to be part of this Section.

1612.3.1 Design flood elevations. Where design flood elevations are not included in the flood hazard areas established in Section 1612.3, or where floodways are not designated, the code official is authorized to require the applicant to:

1. Obtain and reasonably utilize any design flood elevation and floodway data available from a federal, state, or other source, or
2. Determine the design flood elevation and/or floodway in accordance with accepted hydrologic and hydraulic engineering practices used to define special flood hazard areas. Determinations shall be undertaken by a registered design professional who shall document that the technical methods used reflect currently accepted engineering practice.

106.2 Site plan. The construction documents submitted with the application for permit shall be accompanied by a site plan showing to scale the size and location of new construction and existing structures on the site, distances from lot lines, the established street grades and the proposed finished grades and, as applicable, flood hazard areas, floodways, and design flood elevations; and it shall be drawn in accordance with an accurate boundary line survey. In the case of demolition, the site plan shall show construction to be demolished and the location and size of existing structures and construction that are to remain on the site or plot. The building official is authorized to waive or modify the requirement for a site plan when the application for permit is for alteration or repair or when otherwise warranted.

106.2.1 Design flood elevations. Where design flood elevations are not specified, they shall be established in accordance with Section 1612.3.1.

Reason: The purpose of this code change proposal is to clarify how design flood elevations are to be obtained or determined for those flood hazard areas shown on community flood hazard maps that do not have such flood elevation already specified.

This proposed code change to Section 1612.3 clarifies the authority of the code official to require use of other data which may be obtained from other sources, or to require the applicant to develop flood hazard data. Section 106.2 requires that the construction documents submitted are to be accompanied by a site plan. The site plan is to show, as applicable "flood hazard areas, floodways, and design flood elevations." As written, there appears to be an assumption in Sec. 106.2 and in Section 1612 that flood elevations and floodway designations are available on all flood hazard maps. A large percentage of areas that are mapped as special flood hazard area by the National Flood Insurance Program do not have flood elevations and/or do not have floodway designations (floodways are areas along riverine bodies of water that convey the bulk of floodwaters). The language in this code change proposal parallels language in the IRC at R106.1.3 and R324.1.3.1 (Determination of design flood elevations).

The technical information used to substantiate this proposal is the NFIP regulation §60.3(b)(4).

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: Where design flood elevations are not established, this proposal gives the needed guidance for making that determination and grants the building official the necessary authority to require that determination to be made.

Assembly Action:

None

Final Hearing Results

S22-06/07

AS

Code Change No: S23-06/07

Original Proposal

Section: 1613.1

Proponent: Phillip A. Brown, American Fire Sprinkler Association

Revise as follows:

1613.1 Scope. Every structure, and portion thereof, including nonstructural components that are permanently attached to structures and their supports and attachments, shall be designed and constructed to resist the effects of earthquake motions in accordance with ASCE 7, excluding Chapter 14 and Appendix 11A. The seismic design category for a structure is permitted to be determined in accordance with Section 1613 or ASCE 7.

Exceptions:

1. Detached one- and two-family dwellings, assigned to Seismic Design Category A, B or C, or located where the mapped short-period spectral response acceleration, S_s , is less than 0.4 g.
2. The seismic-force-resisting system of wood-frame buildings that conform to the provisions of Section 2308 are not required to be analyzed as specified in this section.
3. Agricultural storage structures intended only for incidental human occupancy.
4. Structures that require special consideration of their response characteristics and environment that are not addressed by this code or ASCE 7 and for which other regulations provide seismic criteria, such as vehicular bridges, electrical transmission towers, hydraulic structures, buried utility lines and their appurtenances and nuclear reactors.
5. Automatic fire sprinkler systems, designed and constructed in accordance with NFPA 13 shall be deemed to meet the requirements of ASCE 7.

Reason: The purpose of the code change proposal is to add a new exception to the code. The proposed exception will bring the IBC to the forefront of the latest developments in earthquake protection for automatic fire sprinkler systems. With the help of professionals involved with the NEHRP and ASCE 7, NFPA 13 has undergone extensive enhancements to its earthquake protection criteria, as is evident in the tentative interim amendment to the 2002 edition and the forthcoming 2006 edition criteria. The new criteria meet or exceed ASCE 7 requirements with regard to force and displacement. As such, ASCE 7, in its interim update process, will defer to NFPA 13 without caveat for earthquake protection of fire sprinkler systems.

The NFPA Technical Committee on Hanging and Bracing of Water-Based Fire Protection Systems made several modifications to Section 9.3.5 to ensure that the seismic brace criteria within NFPA 13 would properly align with the requirements and permitted limits of ASCE 7. These changes, in combination with the initial TIA, and the Report on Proposals will ensure that NFPA 13 is applicable for all seismic applications. In addition, the changes provide a simplified method to meet the requirements of ASCE 7 without having to develop a complete engineering analysis. These requirements do not prohibit an engineer from doing a complete design and analysis in compliance with ASCE 7 requirements, but have been developed to address the requirements of ASCE 7 and present the material in a way that allows for the requirements to remain in NFPA 13 for seismic design of sprinkler systems. Additionally, these requirements have been developed to provide as much material as possible in NFPA 13 while limiting the amount of required information needed from outside sources.

Bibliography: 13-259a Log #CC101 AUT-HBS NFPA 13 Report on Comments A2006 – Copyright NFPA

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Modified

Replace proposal with the following:

1613.6.3 Automatic fire sprinkler systems. Automatic fire sprinkler systems designed and installed in accordance with NFPA 13 shall be deemed to meet the requirements of Section 13.6.8 of ASCE 7.

Chapter 35 NFPA

13-02_07 Installation of Sprinkler Systems

Committee Reason: The proposal recognizes automatic sprinkler systems installed under the 2007 edition of NFPA 13 as complying with the ASCE 7 seismic load provisions. The modification places this provision in a more appropriate code section.

Assembly Action:

None

Final Hearing Results

S23-06/07

AM

Code Change No: **S24-06/07**

Original Proposal

Sections: 1613.6, 2101.2.2

Proponent: Ronald E. Barnett, AERCON Florida, LLC, representing Autoclaved Aerated Concrete Products Association

1. Add new text as follows:

1613.6.3 Autoclaved aerated concrete (AAC) masonry shear wall design coefficients and system limitations. Add the following text at the end of Section 12.2.1 of ASCE 7:

For ordinary reinforced AAC masonry shear walls used in the seismic force-resisting system of structures, the response modification factor, R , shall be permitted to be taken as 3, the deflection application factor, C_d , shall be permitted to be taken as 3, and the system overstrength factor, Ω_o , shall be permitted to be taken as $2\frac{1}{2}$. The maximum height for ordinary reinforced AAC masonry shear walls shall not be limited for buildings assigned to Seismic Design Category B, shall be limited to 160 feet (48768 mm) for buildings assigned to Seismic Design Category C, shall be limited to 65 feet (19812 mm) for buildings assigned to Seismic Design Category D, and is not permitted for buildings assigned to Seismic Design Categories E and F.

For ordinary plain (unreinforced) AAC masonry shear walls used in the seismic force-resisting system of structures, the response modification factor, R , shall be permitted to be taken as $1\frac{1}{2}$, the deflection application factor, C_d , shall be permitted to be taken as $1\frac{1}{2}$, and the system overstrength factor, Ω_o , shall be permitted to be taken as $2\frac{1}{2}$. The maximum height for ordinary plain (unreinforced) AAC masonry shear walls shall not be limited for buildings assigned to Seismic Design Category B and is not permitted for buildings assigned to Seismic Design Category B and is not permitted for buildings assigned to Seismic Design Categories C, D, E and F..

2. Revise as follows:

2101.2.2 Strength design. Masonry designed by the strength design method shall comply with the provisions of Sections 2106 and 2108, except that AAC masonry shall comply with the provisions of Section 2106, Section 1613.6.3, and Chapter 1 and Appendix A of ACI 530/ASCE 5/TMS 402. ~~AAC Masonry shall not be used in the seismic force-resisting system of structures classified as Seismic Design Category B, C, D, E or F.~~

Reason: The sentence "AAC Masonry shall not be used in the seismic force resisting system of structures classified as Seismic Design Category B, C, D, E or F." is not in the 2005 MSJC *Code and Specification*. It was added during the 2005 ICC Structural Hearings in Cincinnati through a floor amendment proposed by the Code Resource Support Committee (CRSC) of the Building Seismic Safety Council (BSSC). This amendment was presented due to CRSC's concerns that the seismic provisions had not been reviewed by BSSC, as well as a specific concern over the lack of height limitations in the 2005 MSJC provisions. We bring this modified proposal to you at these hearings after amicable and productive dialog with many key members of BSSC, CRSC, and ASCE 7. Based on those discussions, this modified proposal includes prescriptive height limitations; it limits ductile reinforced AAC masonry shear-wall systems to SDC A through D; it limits unreinforced AAC masonry shear-wall systems to SDC A and B; and it prescribes seismic design factors for each system. The adoption of this proposal will permit this well-established and well-documented structural system to be used in the U.S.A. as it is in Europe, Japan and elsewhere. Since the ASCE 7 cycle is not complete, we are proposing to add information on the seismic factors to Section 1613.6 Alternatives to ASCE 7 as a temporary measure until they can be incorporated into ASCE 7. This is not a unique situation; the proposed exception would join two other exceptions to ASCE 7 in that section. Through ASCE 7 itself, and through the BSSC PUC working group charged with coordination with ASCE 7, we intend to work for direct inclusion of these seismic design factors into ASCE 7 as soon as the ASCE 7 cycle permits.

The proposed modification is based on the results of the ANSI-consensus provisions of the 2005 MSJC *Code and Specification*, including its provisions for AAC masonry and considerable review and discussion with other committees charged with protection of the seismic safety of the public. This is a far better solution than the current prohibition outside of SDC A, which was made on procedural rather than technical grounds. Also, the proposed values of R and C_d , which were determined in accordance with AC215 and already approved by ICC-ES, are consistent with the stated intentions of the Code Resource Support Committee (CRSC) of the Building Seismic Safety Council (BSSC) for development of acceptance criteria for new materials.

The first basis for our proposed modification is technical. No technical data was advanced in support of the current exclusion -- only that the intervening group had not had time to study it. They have now undertaken that study. Ample technical justification confirming the seismic reliability of AAC masonry, and supporting the proposed seismic design factors, has been published in refereed conference proceedings since June 2003. The 2005 MSJC provisions for AAC masonry are supported by three refereed journal papers, many refereed conference proceedings, and a coherent and rigorously applied body of uncontested technical information. The refereed journal papers are listed below:

Tanner, J.E., Varela, J.L., Klingner, R.E., "Design and Seismic Testing of a Two-story Full-scale Autoclaved Aerated Concrete (AAC) Assemblage Specimen," *Structures Journal*, American Concrete Institute, Farmington Hills, Michigan, vol. 102, no. 1, January - February 2005, pp. 114-119.

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Tanner, J.E., Varela, J.L., Klingner, R.E., Brightman M. J. and Cancino, U., "Seismic Testing of Autoclaved Aerated Concrete (AAC) Shear Walls: A Comprehensive Review," *Structures Journal*, American Concrete Institute, Farmington Hills, Michigan, vol. 102, no. 3, May - June 2005, pp. 374-382.

Varela, J. L., Tanner, J. E. and Klingner, R. E., "Development of Seismic Force-Reduction and Displacement Amplification Factors for AAC Structures," *EERI Spectra* (accepted for publication, May 2005).

Prior to our work in developing the procedure for AAC as described in the ICC-ES AC215 document entitled "ACCEPTANCE CRITERIA FOR SEISMIC DESIGN FACTORS AND COEFFICIENTS FOR SEISMIC-FORCE-RESISTING SYSTEMS OF AUTOCLAVED AERATED CONCRETE (AAC)", approved in October 2003, there had not been any procedure developed for the establishment of R and CD values for new materials. The values proposed in this modification for AAC were developed in accordance with the acceptance criteria approved in AC215 and are consistent with the stated intentions of the Code Resource Support Committee (CRSC) of the Building Seismic Safety Council (BSSC) for development of acceptance criteria for new materials.

As can be seen in that research, for ductile reinforced AAC masonry shear walls the requested values of 3 for the response modification factor, R and the deflection application factor, CD, are conservative, which provides an additional factor of safety beyond that which would normally be expected for any building material or system. In addition, for unreinforced AAC masonry shear walls, the requested values of 1.5 for the response modification factor, R and the deflection application factor, CD, are consistent with the values currently prescribed for unreinforced masonry.

The second basis for our proposed modification is the life safety of the public that the ICC is charged with protecting. There is no justification for denying to that public a building system that was introduced in 1929; that is demonstrably safe, environmentally friendly, energy-efficient, and comfortable to live in; and that is recognized throughout the world, including many areas of high seismic risk and strict design and construction standards.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Errata: Revise Item 1 of proposal to read as follows:

1613.6.3 Autoclaved aerated concrete (AAC) masonry shear wall design coefficients and system limitations. Add the following text at the end of Section 12.2.1 of ASCE 7:

For ordinary reinforced AAC masonry shear walls used in the seismic force-resisting system of structures, the response modification factor, R, shall be permitted to be taken as 3, the deflection amplification factor, C_d, shall be permitted to be taken as 3, and the system overstrength factor, ω , shall be permitted to be taken as 2½. The maximum height for ordinary reinforced AAC masonry shear walls shall not be limited for buildings assigned to Seismic Design Category B, shall be limited to 160 feet (48768 mm) for buildings assigned to Seismic Design Category C, shall be limited to 65 feet (19812 mm) for buildings assigned to Seismic Design Category D, and is not permitted for buildings assigned to Seismic Design Categories E and F.

For ordinary plain (unreinforced) AAC masonry shear walls used in the seismic force-resisting system of structures, the response modification factor, R, shall be permitted to be taken as 1½, the deflection amplification factor, C_d, shall be permitted to be taken as 1½, and the system overstrength factor, ω , shall be permitted to be taken as 2½. The maximum height for ordinary plain (unreinforced) AAC masonry shear walls shall not be limited for buildings assigned to Seismic Design Category B and is not permitted for buildings assigned to Seismic Design Categories C, D, E and F.

Committee Action:

Approved as Modified

Modify proposal as follows:

1613.6.3 Autoclaved aerated concrete (AAC) masonry shear wall design coefficients and system limitations. Add the following text at the end of Section 12.2.1 of ASCE 7:

For ordinary reinforced AAC masonry shear walls used in the seismic force-resisting system of structures, the response modification factor, R, shall be permitted to be taken as ~~3~~ 2, the deflection amplification factor, C_d, shall be permitted to be taken as ~~3~~ 2, and the system overstrength factor, ω , shall be permitted to be taken as 2½. ~~The maximum height for ordinary reinforced AAC masonry shear walls shall not be limited in height for buildings assigned to Seismic Design Category B, shall be limited in height to 160 feet (48768 mm) for buildings assigned to Seismic Design Category C, shall be limited to 65 feet (19812 mm) for buildings assigned to Seismic Design Category D, and is not permitted for buildings assigned to Seismic Design Categories D, E and F.~~

For ordinary plain (unreinforced) AAC masonry shear walls used in the seismic force-resisting system of structures, the response modification factor, R, shall be permitted to be taken as 1½, the deflection amplification factor, C_d, shall be permitted to be taken as 1½, and the system overstrength factor, ω , shall be permitted to be taken as 2½. ~~The maximum height for ordinary plain (unreinforced) AAC masonry shear walls shall not be limited in height for buildings assigned to Seismic Design Category B and is not permitted for buildings assigned to Seismic Design Categories C, D, E and F.~~

2101.2.2 Strength design. Masonry designed by the strength design method shall comply with the provisions of Sections 2106 and 2108, except that AAC masonry shall comply with the provisions of Section 2106, Section 1613.6.3, and Chapter 1 and Appendix A of ACI 530/ASCE 5/TMS 402.

Committee Reason: This code change adds seismic design coefficients and limitations for autoclaved aerated masonry shear wall systems, thus extending the use of these systems in seismic applications. The modification provides that these systems will not be used in Seismic Design Category D, E or F buildings.

Assembly Action:

None

Final Hearing Results

S24-06/07

AM

Code Change No: **S26-06/07**

Original Proposal

Section: 1613.7 (New)

Proponent: Edward A. Donoghue, Edward A. Donoghue Associates Inc., representing National Elevator Industry, Inc.

Add new text as follows:

1613.7 Modifications to ASCE 7.

1613.7.1 ASCE 7, Section 13.6.10.3 Seismic Controls. Modify ASCE 7, Section 13.6.10.3 to read as follows:

13.6.10.3 Seismic Controls. Seismic switches shall be in accordance with Section 8.4.10 of ASME A17.1.

Reason: Delete duplicate requirements.

Seismic switches and elevator operation, after switch activation, are already defined in A17.1-2004, Section 8.4.10, Emergency Operation and Signaling Devices. A17.1 and ASCE 7 seismic switch and mounting requirements are different and inconsistent. A17.1 requires mounting the switch, when exclusively to control elevators, in the machine room and, where possible, adjacent to a vertical load bearing building structural member with its axis of sensitivity in the vertical direction and set to trigger at 0.15g. Placing the switch near a vertical structural support member will prevent significant amplification of vertical motions between the foundation and seismic trigger. At small and moderate ground motions, buildings often exhibit horizontal amplifications at the top of 3 or more. Thus, with horizontal ground motions of 0.1 g, a value commonly experienced in California, the ASCE 7 seismic switch shall trigger elevator shutdowns. This requires the elevator be inspected by an elevator mechanic, adding unnecessary disruption and cost. The seismic switch used by A17.1 is designed to trigger on the P wave so that, in many cases, it will provide adequate time to stop the elevator and allow passengers to exit the elevator before severe shaking in the building starts. This earlier trigger is also more likely to allow passengers to exit the elevator prior to loss of building power, a common occurrence in moderate earthquakes. This early exit would avoid having passengers trapped in an elevator during an earthquake and the need for first responders to rescue them from the elevator.

Movement of the elevator after the seismic switch has triggered, even in "life-safety" facilities, is a significant elevator operation. It is felt that ASCE 7 does not go into enough detail of procedures for this operation. A17.1-2004, 8.4.10, has a prescribed elevator operation in the event a seismic switch or counterweight (CWT) derailment switch is activated. An activated CWT derailment switch indicates that the CWT is out of its normal running position and may be totally out of its guide rails. Upon activation of the CWT derailment switch, A17.1 does not allow movement of the car towards the CWT, in order to prevent the possible collision of the elevator car and CWT. There could be great risk of injury and death to elevator passengers and damage to building structures by having an elevator running while its CWT derailment switch is activated. A17.1 Earthquake Safety Committee is currently working on a post-earthquake procedure/operation guideline to expedite returning elevator service to key buildings.

Reference ASME A17.1 – 2004, 8.4.10.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Modified

Replace proposal with the following:

1613.6.3 Seismic controls for elevators. Seismic switches in accordance with Section 8.4.10 of ASME A17.1 shall be deemed to comply with Section 13.6.10.3 of ASCE 7.

Committee Reason: This proposal clarifies the application of multiple provisions in referenced standards for seismic controls on elevators. The modification adds an IBC provision, recognizing seismic switches in accordance with ASME A17.1 as deemed to comply with the ASCE 7 requirements for seismic controls.

Assembly Action:

None

Final Hearing Results

S26-06/07

AM

Code Change No: **S28-06/07**

Original Proposal

Section: 1702.1

Proponent: Sam Francis, American Forest & Paper Association

Revise as follows:

**SECTION 1702
DEFINITIONS**

FABRICATED ITEM. Structural, load-bearing or lateral load-resisting assemblies consisting of materials assembled prior to installation in a building or structure, or subjected to operations such as heat treatment, thermal cutting, cold working or reforming after manufacture and prior to installation in a building or structure. Materials produced in accordance with ~~standard specifications referenced by this code, such as rolled structural steel shapes, steel-reinforcing bars, masonry units, and wood structural panels~~ a standard, listed in Chapter 35, that requires quality control to be provided under the supervision of a third party quality control agency shall not be considered “fabricated items.”

Reason: This proposal is intended to clarify the code requirements for special inspections. Many common items are fabricated under standards cited in the IBC. Many of those items are fabricated with strict quality assurance done under third party supervision. In addition, the proposal also eliminates laundry lists from the code text. Such lists make interpretation and maintenance of the code awkward at best but potentially very, very difficult.

The reason for this change is to eliminate what amounts to a duplicate requirement in the code. Special Inspections are exactly analogous to the QC program required by some standards listed in the code. This change makes it clear that the code is not intended to require a redundant set of inspection requirements for those items. They have been produced satisfactorily for many years under the code mandated third party QC and inspection.

Cost Impact: The code change proposal will not increase the cost of construction. Elimination of unnecessary and redundant requirements lower costs of various amounts.

Public Hearing Results

Committee Action:

Approved as Modified

Modify proposal as follows:

FABRICATED ITEM. Structural, load-bearing or lateral load-resisting assemblies consisting of materials assembled prior to installation in a building or structure, or subjected to operations such as heat treatment, thermal cutting, cold working or reforming after manufacture and prior to installation in a building or structure. Materials produced in accordance with standard specifications referenced by this code, such as rolled structural steel shapes, steel-reinforcing bars, masonry units, and wood structural panels or in accordance with a standard, listed in Chapter 35, ~~that requires which provides requirements for~~ quality control to be provided done under the supervision of a third party quality control agency shall not be considered “fabricated items.”

Committee Reason: The proposal clarifies the definition of fabricated item so that the special inspection requirements can be applied more uniformly. The modification retains the current list of specific items that are excluded from the definition of fabricated items.

Assembly Action:

None

Final Hearing Results

S28-06/07

AM

Code Change No: **S29-06/07**

Original Proposal

Sections: 1702, 202

Proponent: William W. Stewart, FAIA, Chesterfield, MO, representing himself

1. Add new definitions as follows:

SECTION 202 DEFINITIONS

LABEL. ~~See Section 1702.1. An identification applied on a product by the manufacturer that contains the name of the manufacturer, the function and performance characteristics of the product or material, and the name and identification of an approved agency and that indicates that the representative sample of the product or material has been tested and evaluated by an approved agency (see Section 1703.5 and "Inspection certificate," "Manufacturer's designation" and "Mark").~~

MANUFACTURER'S DESIGNATION. ~~See Section 1702.1. An identification applied on a product by the manufacturer indicating that a product or material complies with a specified standard or set of rules (see also "Inspection certificate," "Label" and "Mark").~~

MARK. ~~See Section 1702.1. An identification applied on a product by the manufacturer indicating the name of the manufacturer and the function of a product or material (see also "Inspection certificate," "Label" and "Manufacturer's designation").~~

2. Delete definitions without substitution:

SECTION 1702 DEFINITIONS

~~**LABEL.** An identification applied on a product by the manufacturer that contains the name of the manufacturer, the function and performance characteristics of the product or material, and the name and identification of an approved agency and that indicates that the representative sample of the product or material has been tested and evaluated by an approved agency (see Section 1703.5 and "Inspection certificate," "Manufacturer's designation" and "Mark").~~

~~**MANUFACTURER'S DESIGNATION.** An identification applied on a product by the manufacturer indicating that a product or material complies with a specified standard or set of rules (see also "Inspection certificate," "Label" and "Mark").~~

~~**MARK.** An identification applied on a product by the manufacturer indicating the name of the manufacturer and the function of a product or material (see also "Inspection certificate," "Label" and "Manufacturer's designation").~~

Reason: Since label is a term used in many sections (715.3.5, 1404.10, 2303.21 and 2405.5 for example) the definition should be in Chapter 2 not Chapter 17. I have not changed any text, just moved it to 202. The same is true for Manufacturer's Designation and Mark. They are rarely used in the code but they appear more often in other chapters than in Chapter 17. If moved then they should then be deleted from Chapter 17.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: This code change clarifies applicability for the definitions of "mark" and "label" by more appropriately locating them in Chapter 2.

Assembly Action:

None

Final Hearing Results

S29-06/07

AS

Code Change No: **S30-06/07**

Original Proposal

Sections: 1703.6, 2403.1.1 (New) [IEBC 302.1.1 (New)]

Proponent: William W. Stewart, FAIA, Chesterfield, MO, representing himself

1. Delete without substitution:

~~**1703.6 Heretofore approved materials.** The use of any material already fabricated or of any construction already erected, which conformed to requirements or approvals heretofore in effect, shall be permitted to continue, if not detrimental to life, health or safety to the public.~~

(Renumber subsequent sections)

2. Add new text as follows:

3403.1.1 (IEBC 302.1.1) Heretofore approved materials. The use of any material already fabricated or of any construction already erected, which conformed to requirements or approvals heretofore in effect, shall be permitted to continue, if not detrimental to life, health or safety to the public.

Reason: This section covers all existing materials and belongs in Chapter 34 Existing Structures. Section 1703.6 has been moved, with no changes to Chapter 34.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: Rather than relocate to Chapter 34, it is felt that the provision for "heretofore approved materials" is appropriate in its current location, since it would apply to work under construction.

Assembly Action:

None

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

William W. Stewart, FAIA, Chesterfield, MO, representing himself, requests Approval as Submitted.

Commenter's Reason: The committee disapproved this change because they felt it would affect materials in buildings under construction. The commentary makes it clear that this section refers to code complying materials in buildings that have been completed. The commentary says, "If a material or system had been approved before the code took effect, it can continue to be used as long as it can be shown that the material or system is not detrimental to the health or safety of the building occupants or the public. In other words the code is not retroactive."

Therefore this section is more appropriately located in Chapter 34 since Chapter 34 addresses existing buildings. Additionally this stipulation is lost in a section entitled Structural Design since it covers all the materials in a building, not just structural materials.

Final Hearing Results

S30-06/07

AS

Code Change No: **S31-06/07**

Original Proposal

Section: 1704.1

Proponent: Philip Brazil, P.E., Reid Middleton, Inc., representing himself

Revise as follows:

1704.1 General. Where application is made for construction as described in this section, the owner or the registered design professional in responsible charge acting as the owner's agent shall employ one or more special inspectors to provide inspections during construction on the types of work listed under Section 1704. The special inspector shall be a qualified person who shall demonstrate competence, to the satisfaction of the building official, for inspection of the particular type of construction or operation requiring special inspection. These inspections are in addition to the inspections specified in Section 109.

Exceptions:

1. Special inspections are not required for work of a minor nature or as warranted by conditions in the jurisdiction as approved by the building official.
2. Special inspections are not required for building components unless the design involves the practice of professional engineering or architecture as defined by applicable state statutes and regulations governing the professional registration and certification of engineers or architects.
3. Unless otherwise required by the building official, special inspections are not required for occupancies in ~~Group R-3 as applicable in Section 101.2 and occupancies in Group U~~ that are accessory to a residential occupancy including, but not limited to, those listed in Section 312.1.

Reason: In the 2003 IBC, there were approximately 45 provisions applicable to "Group R-3 as applicable in Section 101.2." Section 101.2 requires application of the provisions of the IBC to every building or structure or any appurtenances connected to or attached to such buildings or structures. Detached one- and two-family dwellings and multiple single-family dwellings not more than three stories above grade with a separate means of egress and their accessory structures, however, are required to comply with the IRC. Existing buildings undergoing repair, alteration or additions and changes of occupancy are permitted to comply with the IEBC.

In the 2006 IBC, the phrase, "as applicable in Section 101.2," has been deleted in virtually all cases except for Exception 3 to Section 1704.1. Currently, Exception 3 exempts Group R-3 occupancies complying with the IRC from the requirements for special inspection in the IBC. If deletion of the phrase, "as applicable in Section 101.2," in Section 1704.1 were to occur, Group R-3 occupancies complying with the IBC would be exempt from the requirements for special inspection in the IBC.

The proposal deletes the exemption for Group R-3 occupancies. The structural systems of Group R-3 buildings can just as complex and challenging as those of commercial structures. The use of high-strength concrete, structural steel, high-strength bolting, complete-penetration groove welds, engineered masonry, pile foundations and other materials, components and systems that typically receive special inspection in commercial structures are often seen in Group R-3 buildings. In Seismic Design Categories C, D, E and F, engineered seismic-force-resisting systems are also common.

The requirement for special inspection of Group R-3 occupancies in the IBC is warranted and should be retained. Exception 1 to Section 1704.1 will continue to provide the building official with the discretion to exempt work of a minor nature or as warranted by conditions in the jurisdiction from the requirement for special inspection.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: Removing the special inspection exemption for Group R-3 is an improvement that is also consistent with action taken in previous code development cycle.

Assembly Action:

None

Final Hearing Results

S31-06/07

AS

Code Change No: **S32-06/07****Original Proposal****Section: 1704.1**

Proponent: Brian Scot Tollisen, P.E., New York Department of State Division of Code Enforcement and Administration

Revise as follows:

1704.1 General. Where application is made for construction as described in this section, the owner or the registered design professional in responsible charge acting as the owner's agent shall employ one or more special inspectors to provide inspections during construction on the types of work listed under Section 1704. ~~The special inspector shall be a qualified person who shall demonstrate competence, to the satisfaction of the building official, for the inspection of the particular type of construction or operation requiring special inspection.~~ These inspections are in addition to the inspections identified in Section 109.

The special inspector shall be a qualified person who shall demonstrate competence, to the satisfaction of the building official, for the inspection of the particular type of construction or operation requiring special inspection. The special inspector shall provide written documentation to the building official demonstrating their competence and relevant experience. Experience shall be considered relevant when the documented experience is related in complexity to the same type of special inspection activities for projects of similar complexity and material qualities. These qualifications are in addition to qualifications specified in other sections of this code.

Exceptions:

1. Special inspections are not required for work of a minor nature or as warranted by conditions in the jurisdiction as approved by the building official.
2. Special inspections are not required for building components unless the design involves the practice of professional engineering or architecture as defined by applicable state statutes and regulations governing the professional registration and certification of engineers or architects.
3. Unless otherwise required by the building official, special inspections are not required for occupancies in Group R-3 as applicable in Section 101.2 and occupancies in Group U that are accessory to a residential occupancy including, but not limited to, those listed in Section 312.1.

Reason: The purpose of this proposal is to provide an adequate pool of qualified and knowledgeable special inspectors. The additions to IBC Section 1704.1 are proposed with the intention to standardize special inspection qualifications within the model code.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results**Committee Action:****Approved as Modified****Modify proposal as follows:**

1704.1 General. Where application is made for construction as described in this section, the owner or the registered design professional in responsible charge acting as the owner's agent shall employ one or more special inspectors to provide inspections during construction on the types of work listed under Section 1704. These inspections are in addition to the inspections identified in Section 109. The special inspector shall be a qualified person who shall demonstrate competence, to the satisfaction of the building official, for the inspection of the particular type of construction or operation requiring special inspection. The special inspector shall provide written documentation to the building official demonstrating their competence and relevant experience or training. Experience or training shall be considered relevant when the documented experience or training is related in complexity to the same type of special inspection activities for projects of similar complexity and material qualities. These qualifications are in addition to qualifications specified in other sections of this code.

Exceptions:

1. Special inspections are not required for work of a minor nature or as warranted by conditions in the jurisdiction as approved by the building official.

2. Special inspections are not required for building components unless the design involves the practice of professional engineering or architecture as defined by applicable state statutes and regulations governing the professional registration and certification of engineers or architects.
3. Unless otherwise required by the building official, special inspections are not required for occupancies in Group R-3 as applicable in Section 101.2 and occupancies in Group U that are accessory to a residential occupancy including, but not limited to, those listed in Section 312.1.

Committee Reason: This proposal will promote standardized special inspector qualifications. It is felt that poorly trained special inspectors have impacted construction in some areas. The modification adds training as a qualification that would be equivalent to relevant experience.

Assembly Action:

None

Final Hearing Results

S32-06/07

AM

Code Change No: S35-06/07

Original Proposal

Sections: 1704.4, 1705.3, 1709.2, 1805.5.7, 1805.9, 1808.2.5, 1808.2.23.2, 1904.2.2, 1909.4, 1915.5, 2308.3.3, 2308.11.1, 2308.12.1

Proponent: Philip Brazil, P.E., Reid Middleton, Inc., representing himself

Revise as follows:

1704.4 Concrete construction. The special inspections and verifications for concrete construction shall be as required by this section and Table 1704.4.

Exception: Special inspections shall not be required for:

1. Isolated spread concrete footings of buildings three stories or less ~~in height~~ above grade plane that are fully supported on earth or rock.
2. Continuous concrete footings supporting walls of buildings three stories or less ~~in height~~ above grade plane that are fully supported on earth or rock where:
 - 2.1. The footings support walls of light frame construction;
 - 2.2. The footings are designed in accordance with Table 1805.4.2; or
 - 2.3. The structural design of the footing is based on a specified compressive strength, f'_c , no greater than 2,500 pounds per square inch (psi) (17.2 Mpa), regardless of the compressive strength specified in the construction documents or used in the footing construction.
3. Nonstructural concrete slabs supported directly on the ground, including prestressed slabs on grade, where the effective prestress in the concrete is less than 150 psi (1.03 Mpa).
4. Concrete foundation walls constructed in accordance with Table 1805.5(5).
5. Concrete patios, driveways and sidewalks, on grade.

1705.3 Seismic resistance. The statement of special inspections shall include seismic requirements for the following cases:

1. The seismic-force-resisting systems in structures assigned to Seismic Design Category C, D, E or F, in accordance with Section 1613.
2. Designated seismic systems in structures assigned to Seismic Design Category D, E or F.
3. The following additional systems and components in structures assigned to Seismic Design Category C:
 - 3.1. Heating, ventilating and air-conditioning (HVAC) ductwork containing hazardous materials and anchorage of such ductwork.
 - 3.2. Piping systems and mechanical units containing flammable, combustible or highly toxic materials.

- 3.3. Anchorage of electrical equipment used for emergency or standby power systems.
4. The following additional systems and components in structures assigned to Seismic Design Category D:
 - 4.1. Systems required for Seismic Design Category C.
 - 4.2. Exterior wall panels and their anchorage.
 - 4.3. Suspended ceiling systems and their anchorage.
 - 4.4. Access floors and their anchorage.
 - 4.5. Steel storage racks and their anchorage, where the importance factor is equal to 1.5 in accordance with Section 15.5.3 of ASCE 7.
5. The following additional systems and components in structures assigned to Seismic Design Category E or F:
 - 5.1. Systems required for Seismic Design Categories C and D.
 - 5.2. Electrical equipment.

Exception: Seismic requirements are permitted to be excluded from the statement of special inspections for structures designed and constructed in accordance with the following:

1. The structure consists of light-frame construction; the design spectral response acceleration at short periods, S_{DS} , as determined in Section 1613.5.4, does not exceed 0.5g; and the height of the structure does not exceed 35 feet (10 668 mm) above grade plane; or
2. The structure is constructed using a reinforced masonry structural system or reinforced concrete structural system; the design spectral response acceleration at short periods, S_{DS} , as determined in Section 1613.5.4, does not exceed 0.5g, and the height of the structure does not exceed 25 feet (7620 mm) above grade plane; or
3. Detached one- or two-family dwellings not exceeding two stories ~~in height above grade plane~~, provided the structure does not have any of the following plan or vertical irregularities in accordance with Section 12.3.2 of ASCE 7:
 - 3.1. Torsional irregularity.
 - 3.2. Nonparallel systems.
 - 3.3. Stiffness irregularity—extreme soft story and soft story.
 - 3.4. Discontinuity in capacity—weak story.

1709.2 Structural observations for seismic resistance. Structural observations shall be provided for those structures included in Seismic Design Category D, E or F, as determined in Section 1613.5.6, where one or more of the following conditions exist:

1. The structure is classified as Occupancy Category III or IV in accordance with Table 1604.5.
2. The height of the structure is greater than 75 feet (22 860 mm) above the base.
3. The structure is assigned to Seismic Design Category E, is classified as Occupancy Category I or II in accordance with Table 1604.5, and is greater than two stories ~~in height above grade plane~~.
4. When so designated by the registered design professional in responsible charge of the design.
5. When such observation is specifically required by the building official.

1805.5.7 Pier and curtain wall foundations. Except in Seismic Design Categories D, E and F, pier and curtain wall foundations are permitted to be used to support light-frame construction not more than two stories ~~in height above grade plane~~, provided the following requirements are met:

1. All load-bearing walls shall be placed on continuous concrete footings bonded integrally with the exterior wall footings.
2. The minimum actual thickness of a load-bearing masonry wall shall not be less than 4 inches (102 mm) nominal or 3-5/8 inches (92 mm) actual thickness, and shall be bonded integrally with piers spaced 6 feet (1829 mm) on center (o.c.).
3. Piers shall be constructed in accordance with Chapter 21 and the following:
 - 3.1. The unsupported height of the masonry piers shall not exceed 10 times their least dimension.
 - 3.2. Where structural clay tile or hollow concrete masonry units are used for piers supporting beams and girders, the cellular spaces shall be filled solidly with concrete or Type M or S mortar.

Exception: Unfilled hollow piers are permitted where the unsupported height of the pier is not more than four times its least dimension.

- 3.3. Hollow piers shall be capped with 4 inches (102 mm) of solid masonry or concrete or the cavities of the top course shall be filled with concrete or grout.

4. The maximum height of a 4-inch (102mm) load-bearing masonry foundation wall supporting wood frame walls and floors shall not be more than 4 feet (1219 mm) in height.
5. The unbalanced fill for 4-inch (102 mm) foundation walls shall not exceed 24 inches (610 mm) for solid masonry, nor 12 inches (305mm) for hollow masonry.

1805.9 Seismic requirements. See Section 1908 for additional requirements for footings and foundations of structures assigned to Seismic Design Category C, D, E or F.

For structures assigned to Seismic Design Category D, E or F, provisions of ACI 318, Sections 21.10.1 to 21.10.3, shall apply when not in conflict with the provisions of Section 1805. Concrete shall have a specified compressive strength of not less than 3,000 psi (20.68 MPa) at 28 days.

Exceptions:

1. Group R or U occupancies of light-framed construction and two stories or less in height above grade plane are permitted to use concrete with a specified compressive strength of not less than 2,500 psi (17.2 MPa) at 28 days.
2. Detached one- and two-family dwellings of light-frame construction and two stories or less in height above grade plane are not required to comply with the provisions of ACI 318, Sections 21.10.1 to 21.10.3.

1808.2.5 Stability. Piers or piles shall be braced to provide lateral stability in all directions. Three or more piles connected by a rigid cap shall be considered braced, provided that the piles are located in radial directions from the centroid of the group not less than 60 degrees (1 rad) apart. A two-pile group in a rigid cap shall be considered to be braced along the axis connecting the two piles. Methods used to brace piers or piles shall be subject to the approval of the building official.

Piles supporting walls shall be driven alternately in lines spaced at least 1 foot (305 mm) apart and located symmetrically under the center of gravity of the wall load carried, unless effective measures are taken to provide for eccentricity and lateral forces, or the wall piles are adequately braced to provide for lateral stability. A single row of piles without lateral bracing is permitted for one- and two-family dwellings and lightweight construction not exceeding two stories above grade plane or 35 feet (10 668 mm) in height, provided the centers of the piles are located within the width of the foundation wall.

1808.2.23.2 Seismic Design Category D, E or F. Where a structure is assigned to Seismic Design Category D, E or F in accordance with Section 1613, the requirements for Seismic Design Category C given in Section 1808.2.23.1 shall be met, in addition to the following. Provisions of ACI 318, Section 21.10.4, shall apply when not in conflict with the provisions of Sections 1808 through 1812. Concrete shall have a specified compressive strength of not less than 3,000 psi (20.68 MPa) at 28 days.

Exceptions:

1. Group R or U occupancies of light-framed construction and two stories or less in height above grade plane are permitted to use concrete with a specified compressive strength of not less than 2,500 psi (17.2 MPa) at 28 days.
2. Detached one- and two-family dwellings of light-frame construction and two stories or less in height are not required to comply with the provisions of ACI 318, Section 21.10.4.
3. Section 21.10.4.4(a) of ACI 318 need not apply to concrete piles.

1904.2.2 Concrete properties. Concrete that will be subject to the following exposures shall conform to the corresponding maximum water-cementitious materials ratios and minimum specified concrete compressive strength requirements of ACI 318, Section 4.2.2.

1. Concrete intended to have low permeability where exposed to water;
2. Concrete exposed to freezing and thawing in a moist condition or deicer chemicals; or
3. Corrosion protection of reinforcement in concrete exposed to chlorides from deicing chemicals, salt, salt water, brackish water, seawater, or spray from these sources.

Exception: For occupancies and appurtenances thereto in Group R occupancies that are in buildings less than four stories in height above grade plane, normal-weight aggregate concrete shall comply with the requirements of Table 1904.2.2(2) based on the weathering classification (freezing and thawing) determined from Figure 1904.2.2.

In addition, concrete that will be exposed to deicing chemicals shall conform to the limitation of Section 1904.2.3.

1909.4 Design. Structural plain concrete walls, footings and pedestals shall be designed for adequate strength in accordance with ACI 318, Sections 22.4 through 22.8.

Exception: For Group R-3 occupancies and buildings of other occupancies less than two stories ~~in height~~ above grade plane of light-frame construction, the required edge thickness of ACI 318 is permitted to be reduced to 6 inches (152 mm), provided that the footing does not extend more than 4 inches (102 mm) on either side of the supported wall.

1915.5 Fire-resistance-rating protection. Pipe columns shall be of such size or so protected as to develop the required fire-resistance ratings specified in Table 601. Where an outer steel shell is used to enclose the fire protective covering, the shell shall not be included in the calculations for strength of the column section. The minimum diameter of pipe columns shall be 4 inches (102 mm) except that in structures of Type V construction not exceeding three stories above grade plane or 40 feet (12 192 mm) in height, pipe columns used in the basement and as secondary steel members shall have a minimum diameter of 3 inches (76 mm).

2308.3.3 Sill anchorage. Where foundations are required by Section 2308.3.4, braced wall line sills shall be anchored to concrete or masonry foundations. Such anchorage shall conform to the requirements of Section 2308.6 except that such anchors shall be spaced at not more than 4 feet (1219 mm) o.c. for structures over two stories ~~in height~~ above grade plane. The anchors shall be distributed along the length of the braced wall line. Other anchorage devices having equivalent capacity are permitted.

2308.11.1 Number of stories. Structures of conventional light-frame construction shall not exceed two stories ~~in height~~ above grade plane in Seismic Design Category C.

2308.12.1 Number of stories. Structures of conventional light-frame construction shall not exceed one story ~~in height~~ above grade plane in Seismic Design Category D or E.

Reason: All of the code sections in this proposal have one thing in common. They specify requirements for a building based on its number of stories. A story is defined in Sections 202 and 502.1 as “that portion of a building included between the upper surface of a floor and the upper surface of the floor or roof next above,” which includes portions of a building below grade plane (i.e., basements). Consequently, the number of stories specified in of these code sections would be determined beginning at the bottommost level in the building, which could be several levels (stories) below grade plane. The proposal will establish that the determination begins at the first story above grade plane, which is the probable intent in each case.

This proposal does not include each code section in the IBC that specifies requirements for a building based on its number of stories. There are cases where the determination of the number of stories in a building beginning at the bottommost level is warranted. Please refer to Sections 406.1.1, 415.4, 415.5, 415.7.3.3, 903.2.8.1(1), 1015.2, 2305.1.5, 2305.2.5, 2603.5, 3310.1 and 3311.1.

There are also several code sections in the IBC that currently specify requirements for a building based on its number of stories above grade plane. Please refer to Sections 101.2 (Exception 1), 402.1, 402.7.3, 415.7.3.5, 415.9.2.3, 903.2.3(2), 903.2.6(2), 903.2.8(2), 1009.12, 1002.6 (Exception 1), 1018.2 (Item 1), 1025.1, 1407.11.1, 1407.11.2, 1705.1 (Exceptions 1 and 2), 1509.5, 1807.1.1, 2308.2(1), 2308.2.2 (Exception 2), 2308.11.2 (Exception 1), 2308.12.2 (Exception 1), 2607.3, 2608.2 (Item 1) and 3002.4. See code change proposal G44-04/05 (AM) for further information.

This proposal is partly a continuation of code change proposal G44-04/05 (AM), which successfully distinguished between requirements based on the height or number of stories of a building by measuring from grade plane versus the height of a component of a building by measuring from grade. There is also a similar proposal before the IBC General Committee.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: This code change will clarify the determination of a building's height in stories in the structural chapters by referring to grade plane.

Assembly Action:

None

Final Hearing Results

S35-06/07

AS

Code Change No: **S37-06/07**

Original Proposal

Sections: 1704.7, 1704.8, 1704.9, 1708.4, 1708.5, 1709.2, 1709.3

Proponent: Philip Brazil, P.E., Reid Middleton, Inc., representing himself

Revise as follows:

1704.7 Soils. Special inspections for existing site soil conditions, fill placement and load-bearing requirements shall be as required by this section and Table 1704.7. The approved soils report, required by Section 1802.2, and the documents prepared by the registered design professional ~~in responsible charge~~ shall be used to determine compliance. During fill placement, the special inspector shall determine that proper materials and procedures are used in accordance with the provisions of the approved soils report, as specified in Section 1803.5.

Exception: Special inspection is not required during placement of controlled fill having a total depth of 12 inches (305 mm) or less.

1704.8 Pile foundations. Special inspections shall be performed during installation and testing of pile foundations as required by Table 1704.8. The approved soils report, required by Section 1802.2, and the documents prepared by the registered design professional ~~in responsible charge~~ shall be used to determine compliance.

1704.9 Pier foundations. Special inspections shall be performed during installation and testing of pier foundations as required by Table 1704.9. The approved soils report, required by Section 1802.2, and the documents prepared by the registered design professional ~~in responsible charge~~ shall be used to determine compliance.

1708.4 Structural steel. The testing contained in the quality assurance plan shall be as required by AISC 341 and the additional requirements herein. The acceptance criteria for nondestructive testing shall be as required in AWS D1.1 as specified by the registered design professional.

Base metal thicker than 1.5 inches (38 mm), where subject to through-thickness weld shrinkage strains, shall be ultrasonically tested for discontinuities behind and adjacent to such welds after joint completion. Any material discontinuities shall be accepted or rejected on the basis of ASTM A 435 or ASTM A 898 (Level 1 criteria) and criteria as established by the registered design professional~~(s)~~ in responsible charge and the construction documents.

1708.5 Seismic qualification of mechanical and electrical equipment. The registered design professional ~~in responsible charge~~ shall state the applicable seismic qualification requirements for designated seismic systems on the construction documents. Each manufacturer of designated seismic system components shall test or analyze the component and its mounting system or anchorage and submit a certificate of compliance for review and acceptance by the registered design professional ~~in responsible charge~~ of for the design of the designated seismic system and for approval by the building official. Qualification shall be by actual test on a shake table, by three-dimensional shock tests, by an analytical method using dynamic characteristics and forces, by the use of experience data (i.e., historical data demonstrating acceptable seismic performance) or by more rigorous analysis providing for equivalent safety.

1709.2 Structural observations for seismic resistance. Structural observations shall be provided for those structures included in Seismic Design Category D, E or F, as determined in Section 1613, where one or more of the following conditions exist:

1. The structure is classified as Occupancy Category III or IV in accordance with Section 1604.5.
2. The height of the structure is greater than 75 feet (22 860 mm) above the base.
3. The structure is assigned to Seismic Design Category E, is classified as Occupancy Category I or II in accordance with Section 1604.5 and is greater than two stories in height.
4. When so designated by the registered design professional in responsible charge ~~of the design~~.
5. When such observation is specifically required by the building official.

1709.3 Structural observations for wind requirements. Structural observations shall be provided for those structures sited where the basic wind speed exceeds 110 mph (49 m/sec) determined from Figure 1609, where one or more of the following conditions exist:

1. The structure is classified as Occupancy Category III or IV in accordance with Table 1604.5.
2. The building height of the structure is greater than 75 feet (22 860 mm).
3. When so designated by the registered design professional in responsible charge of the design,
4. When such observation is specifically required by the building official.

Reason: This proposal is in response to Recommendation 28 of the “Final Report on the Collapse of the World Trade Center Towers” (NIST NCSTAR 1). The recommendation assumes that the IBC already defines “design professional in responsible charge,” which is not the case. A related proposal before the General Code Committee will provide a definition in the IBC as well as the IEBC. Note that the term “registered design professional in responsible charge” is used throughout the IBC (i.e., Sections 106.3.4.1, 106.3.4.2, 1704.1, 1704.1.1, 1704.1.2, 1704.7, 1704.8, 1704.9, 1705.1, 1708.4, 1708.5, 1709.2 and 1709.3) as well as the IEBC. Note also that the term is typically not used in other codes published by the International Code Council. Specially, there are no instances of the term “registered design professional in responsible charge” in the 2003 IECC, IFC, IFGC, IMC, IPC or IRC.

The proposed definition in the related proposal before the General Code Committee is consistent with the role the IBC and IEBC currently specify for the registered design professional in responsible charge, which is typically the review and coordination of submittal documents prepared by others, deferred submittal documents and phased submittal documents for compatibility with the design of the building or structure. Refer to Section 106.3.4 in the IBC and IEBC for specific language.

This proposal revises references to “registered design professional in responsible charge” in the structural chapters of the IBC to eliminate conflicts with Section 106.3.4. Sections 1704.7, 1704.8 and 1704.9 use “registered design professional in responsible charge” when referring to the registered design professional responsible for the structural design of a building or structure. Section 1708.5 uses the same term when referring to the registered design professional responsible for the structural design of a designated seismic system in at a building or structure. Section 106.3.4.1, however, states that the registered design professional in responsible charge is “responsible for reviewing and coordinating submittal documents prepared by others, including phased and deferred submittal items, for compatibility with the design of the building.” Sections 1704.7, 1704.8, 1704.9 and 1708.5 are in conflict with Section 106.3.4.1 by using the same term for registered design professionals with responsibilities other than as specified in Section 106.3.4.1.

The IBC currently uses the term “registered design professional” in approximately 50 code sections, in addition to the code sections using the term “registered design professional in responsible charge.” “Registered design professional” refers to an individual responsible for an aspect of the design of a building or structure. Typical examples are the architect, structural engineer, mechanical engineer, electrical engineer, civil engineer, fire protection engineer and others. Referring, instead, to such an individual as a registered design professional in responsible charge is an exercise in stating the obvious. Such individuals are in responsible charge of their individual responsibilities in the design of the building or structure. The term “in responsible charge” is implicit in the term “registered design professional.”

The proposal will eliminate the conflict between Section 106.3.4, which assigns responsibilities to a registered design professional acting as the registered design professional in responsible charge of a project, and other sections of the IBC, which use the same term but do not intend that the responsibilities in Section 106.3.4 also apply.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Modified

Modify proposal as follows:

1704.7 Soils. Special inspections for existing site soil conditions, fill placement and load-bearing requirements shall be as required by this section and Table 1704.7. The approved soils report, required by Section 1802.2, and the documents prepared by the registered design professional shall be used to determine compliance. During fill placement, the special inspector shall determine that proper materials and procedures are used in accordance with the provisions of the approved soils report, as specified in Section 1803.5.

Exception: Special inspection is not required during placement of controlled fill having a total depth of 12 inches (305 mm) or less.

1704.8 Pile foundations. Special inspections shall be performed during installation and testing of pile foundations as required by Table 1704.8. The approved soils report, required by Section 1802.2, and the documents prepared by the registered design professional shall be used to determine compliance.

1704.9 Pier foundations. Special inspections shall be performed during installation and testing of pier foundations as required by Table 1704.9. The approved soils report, required by Section 1802.2, and the documents prepared by the registered design professional shall be used to determine compliance.

1708.4 Structural steel. The testing contained in the quality assurance plan shall be as required by AISC 341 and the additional requirements herein. The acceptance criteria for nondestructive testing shall be as required in AWS D1.1 as specified by the registered design professional. Base metal thicker than 1.5 inches (38 mm), where subject to through-thickness weld shrinkage strains, shall be ultrasonically tested for discontinuities behind and adjacent to such welds after joint completion. Any material discontinuities shall be accepted or rejected on the basis of ASTM A 435 or ASTM A 898 (Level 1 criteria) and criteria as established by the registered design professional in responsible charge and the construction documents.

1708.5 Seismic qualification of mechanical and electrical equipment. The registered design professional shall state the applicable seismic qualification requirements for designated seismic systems on the construction documents. Each manufacturer of designated seismic system components shall test or analyze the component and its mounting system or anchorage and submit a certificate of compliance for review and

acceptance by the registered design professional for the design of the designated seismic system and for approval by the building official. Qualification shall be by actual test on a shake table, by three-dimensional shock tests, by an analytical method using dynamic characteristics and forces, by the use of experience data (i.e., historical data demonstrating acceptable seismic performance) or by more rigorous analysis providing for equivalent safety.

1709.2 Structural observations for seismic resistance. Structural observations shall be provided for those structures included in Seismic Design Category D, E or F, as determined in Section 1613, where one or more of the following conditions exist: The structure is classified as Occupancy Category III or IV in accordance with Section 1604.5.

1. The height of the structure is greater than 75 feet (22 860 mm) above the base.
2. The structure is assigned to Seismic Design Category E, is classified as Occupancy Category I or II in accordance with Section 1604.5 and is greater than two stories in height.
3. When so designated by the registered design professional ~~in responsible charge~~ for the structural design.
4. When such observation is specifically required by the building official.

1709.3 Structural observations for wind requirements. Structural observations shall be provided for those structures sited where the basic wind speed exceeds 110 mph (49 m/sec) determined from Figure 1609, where one or more of the following conditions exist:

1. The structure is classified as Occupancy Category III or IV in accordance with Table 1604.5.
2. The building height of the structure is greater than 75 feet (22 860 mm).
3. When so designated by the registered design professional ~~in responsible charge~~ for the structural design.
4. When such observation is specifically required by the building official.

Committee Reason: The proposal helps to distinguish between the various registered design professionals that are involved in a project by eliminating the phrase "in responsible charge" from Chapter 17. The modification clarifies that it is the registered design professional responsible for the structural design who may require structural observations in structures having higher wind or seismic risks.

Assembly Action:

None

Final Hearing Results

S37-06/07

AM

Code Change No: **S39-06/07**

Original Proposal

Section: 1704.10

Proponent: Paul K. Heilstedt, P.E., representing ICC Code Technology Committee (CTC)

Revise as follows:

1704.10 Sprayed fire-resistant materials. Special inspections for sprayed fire-resistant materials applied to structural elements and decks shall be in accordance with Sections 1704.10.1 through 1704.10.5 6 Special inspections shall be based on the fire-resistance design as designated in the approved construction documents. The tests described in this section shall be based on samplings of specific floor, roof and wall assemblies, and structural framing members. Special inspections shall be performed after the rough installation of electrical, sprinkler, mechanical and plumbing systems and suspension for ceiling systems, where applicable.

1704.10.1 Physical and visual tests. The following physical and visual tests are required to demonstrate compliance with the listing and the fire-resistance rating:

1. Condition of substrates.
2. Thickness of application.
3. Density in pounds per cubic foot (kgs per m³).
4. Bond strength -adhesion/cohesion.
5. Condition of finished application.

~~1704.10.1~~ **1704.10.2 Structural member surface conditions.** The surfaces shall be prepared in accordance with the approved fire-resistance design and the approved manufacturer's written instructions. The prepared surface of structural members to be sprayed shall be inspected before the application of the sprayed fire-resistant material.

~~1704.10.2~~ **1704.10.3 Application.** The substrate shall have a minimum ambient temperature before and after application as specified in the approved manufacturer's written instructions. The area for application shall be ventilated during and after application as required by the approved manufacturer's written instructions.

~~1704.10.3~~ **1704.10.4 Thickness.** The average thickness minus two times the standard deviation of the thickness measurements of the sprayed fire-resistant materials applied to structural elements shall not be less than the thickness required by the approved fire-resistant design. Individual measured thickness, which exceeds the thickness specified in a design by 1/4 inch (6.4 mm) or more, shall be recorded as the thickness specified in the design plus 1/4 inch (6.4 mm). For design thicknesses 1 inch (25 mm) or greater, the minimum allowable individual thickness shall be the design thickness minus 1/4 inch (6.4 mm). For design thicknesses less than 1 inch (25 mm), the minimum allowable individual thickness shall be the design thickness minus 25 percent. Thickness shall be determined in accordance with ASTM E 605. Samples of the sprayed fire-resistant materials shall be selected in accordance with Sections ~~1704.10.3~~ 1704.10.4.1 and ~~1704.10.3.2~~ 1704.10.4.2.

~~1704.10.3.1~~ **1704.10.4.1 Floor, roof and wall assemblies.** The thickness of the sprayed fire-resistant material applied to floor, roof and wall assemblies shall be determined in accordance with ASTM E 605, taking the average minus two times the standard deviation of the thickness measurements of not less than four measurements for each 1,000 square feet (93m²) of the sprayed area on each floor or part thereof.

1704.10.4.1.1 Flat decks. Thickness measurements shall be taken from a 12 inches (305 mm) square with a minimum of four measurements, symmetrically.

1704.10.4.1.2 Fluted decks. Thickness measurements shall be taken from a 12 inches (305 mm) square with four random, symmetrical measurements within the square, including one each of the following: valley, crest and sides and report as an average.

~~1704.10.3.2~~ **1704.10.4.2 Structural framing members.** The thickness of the sprayed fire-resistant material applied to structural members shall be determined in accordance with ASTM E 605. Thickness testing shall be performed on not less than 25 percent of the structural members on each floor.

1704.10.4.2.1 Beams. Thickness measurements shall be made at nine locations around the beam at each end of a 12 inches (305 mm) length.

1704.10.4.2.2 Joists and trusses. Thickness measurements shall be made at seven locations around the joist or truss at each end of a 12 inches (305 mm) length.

1704.10.4.2.3 W-shape columns. Thickness measurements shall be made at 12 locations around the column at each end of a 12 inches (305 mm) length.

1704.10.4.2.4 Tube and pipe columns. Thickness measurements shall be made at a minimum of four locations around the column at each end of a 12 inches (305 mm) length.

~~1704.10.4~~ **1704.10.5 Density.** The density of the sprayed fire-resistant material shall not be less than the density specified in the approved fire-resistant design. Density of the sprayed fire-resistant material shall be determined in accordance with ASTM E 605. The test samples for determining the density of the sprayed fire-resistant materials shall be selected as follows:

1. From each floor, roof and wall assembly at the rate of not less than one sample for every 2,500 square feet (232 m²) or part thereof of the sprayed area in each story.
2. From beams, girders, joists, trusses and columns at the rate of not less than one sample for each type of structural framing member for each 2,500 square feet (232 m²) of floor area or part thereof in each story.

~~1704.10.5~~ **1704.10.6 Bond strength.** The cohesive/adhesive bond strength of the cured sprayed fire-resistant material applied to structural elements shall not be less than 150 pounds per square foot (psf) (7.18 kN/m²). The cohesive/adhesive bond strength shall be determined in accordance with the field test specified in ASTM E 736 by testing in-place samples of the sprayed fire-resistant material selected in accordance with Sections ~~1704.10.5.1~~ and ~~1704.10.5.2~~ 1704.10.6.1 through 1704.10.6.3.

~~1704.10.5.1~~ **1704.10.6.1 Floor, roof and wall assemblies.** The test samples for determining the cohesive/adhesive bond strength of the sprayed fire-resistant materials shall be selected from each floor, roof and wall assembly at the rate of not less than one sample for every 40,000 2,500 square feet (~~929~~ 232 m²) or part thereof of the sprayed area in each story.

~~1704.10.5.2~~ **1704.10.6.2 Structural framing members.** The test samples for determining the cohesive/adhesive bond strength of the sprayed fire-resistant materials shall be selected from beams, girders, joists, trusses and columns at the rate of not less than one sample for each type of structural framing member for each 40,000 2,500 square feet (~~929~~ 232 m²) of floor area or part thereof in each story.

1704.10.6.3 Primer, paint and encapsulant bond tests. Bond tests to qualify a primer, paint or encapsulant shall be conducted only when the fire-resistive coating is applied to a primed, painted or encapsulated surface for which acceptable bond-strength performance between these coatings and the fire resistive material has not been measured. A bonding agent approved by the SFRM manufacturer shall to be applied to a primed, painted or encapsulated surface where the bond strengths are found to be below minimum required values.

Reason: The ICC Board established the ICC Code Technology Committee (CTC) as the venue to discuss contemporary code issues in a committee setting which provides the necessary time and flexibility to allow for full participation and input by any interested party. The code issues are assigned to the CTC by the ICC Board as "areas of study". Information on the CTC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CTC effort can be downloaded from the following website: <http://www.iccsafe.org/cs/cc/ctc/index.html> Since its inception, the CTC has held six meetings - all open to the public.

This proposed change is a result of the CTC's investigation of the area of study entitled "Review of NIST WTC Recommendations". The scope of the activity is noted as:

Review the recommendations issued by NIST in its report entitled "Final Report on the Collapse of the World Trade Center Towers", issued September 2005, for applicability to the building environment as regulated by the I-Codes.

This proposal is intended to address only a portion of NIST recommendation 6. For this specific proposed change, CTC is working in cooperation with the NIBS/MMC Committee to Translate the NIST World Trade Center Investigation Recommendations for the Model Codes. The CTC notes in their investigation that many of the recommendations contained in the NIST report require additional information for the CTC to further investigate. As such, CTC intends to continue to study the other NIST recommendations.

NIST Recommendation 6 recommends the development of criteria, test methods and standards: (1) for the in-service performance of sprayed fire-resistance materials (SFRM, also commonly referred to as fireproofing or insulation) used to protect structural components; and (2) to ensure that these materials, as-installed, conform to conditions in tests used to establish the fire resistance rating of components, assemblies, and systems.

As noted above, this proposed change does not address all aspects of NIST recommendation #6. This proposed change is limited to the necessary inspection parameters for spray applied fire resistant materials after installation and renovation of mechanical, plumbing, electrical and other similar systems.

The proposed revisions are intended to coordinate the text of the IBC with the two standards currently referenced in the code- ASTM 605 and ASTM 736, and also AWCI Technical Manual 12-A Standard Practice for the Testing and Inspection of Filed Applied Sprayed Fire-resistive Materials which is a guide and as such, is not referenced in the code. This proposal also adds sampling criteria for density measurements (proposed Section 1704.10.5) in addition to the current sampling criteria for bond measurements. However, it is noted that there are two significant differences between this proposal and the standards noted. The first is the determination of thickness in proposed Section 1704.10.4 which is not in the standards. By using the standard deviation method, the test samples must fall within a specified range, otherwise, the combination of very thin samples of spray applied coatings with thick samples may lead to the application passing the test when in reality, the thin sections represent an insufficient amount of fire proofing. The second is the sample size. Currently, ASTM E 605 stipulates the 10,000 square foot sample size that is also in the code. Given the critical nature of spray-applied fire proofing, as noted in the NIST report, this sampling size is viewed as too large, resulting in an increased probability of inadequate protection. This proposal uses a value of 2,500 square feet.

Recommendation #6 also addresses the in-service performance (criteria for performance and durability such as bond strength) of spray applied fire resistance which requires further substantiation.

Bibliography:

Interim Report No. 1 of the CTC, Area of Study – Review of NIST WTC Recommendations, March 9, 2006.

National Institute of Standards and Technology. Final Report of the National Construction Safety Team on the Collapses of the World Trade Center Towers. United States Government Printing Office: Washington, D.C. September 2005.

Cost Impact: The code change proposal will increase the cost of construction due to more frequent sampling of spray applied material.

Public Hearing Results

Committee Action:

Approved as Modified

Modify proposal as follows:

1704.10 Sprayed fire-resistant materials. Special inspections for sprayed fire-resistant materials applied to structural elements and decks shall be in accordance with Sections 1704.10.1 through 1704.10.6 Special inspections shall be based on the fire-resistance design as designated in the approved construction documents. The tests described in this section shall be based on samplings of specific floor, roof and wall assemblies, and structural framing members. Special inspections shall be performed after the rough installation of electrical, sprinkler, mechanical and plumbing systems and suspension for ceiling systems, where applicable.

1704.10.1 Physical and visual tests. The following physical and visual tests are required to demonstrate compliance with the listing and the fire-resistance rating:

1. Condition of substrates.
2. Thickness of application.
3. Density in pounds per cubic foot (kgs per m³).
4. Bond strength -adhesion/cohesion.
5. Condition of finished application.

1704.10.2 Structural member surface conditions. The surfaces shall be prepared in accordance with the approved fire-resistance design and the approved manufacturer's written instructions. The prepared surface of structural members to be sprayed shall be inspected before the application of the sprayed fire-resistant material.

1704.10.3 Application. The substrate shall have a minimum ambient temperature before and after application as specified in the approved manufacturer's written instructions. The area for application shall be ventilated during and after application as required by the approved manufacturer's written instructions.

1704.10.4 Thickness. ~~The average thickness minus two times the standard deviation of the thickness measurements~~ ~~No more than 10 percent of the thickness measurements~~ of the sprayed fire-resistant materials applied to structural elements shall ~~not~~ be less than the thickness required by the approved fire-resistant design ~~but in no case less than the minimum allowable thickness required by Section 1704.10.4.1. Individual measured thickness, which exceeds the thickness specified in a design by 1/4 inch (6.4 mm) or more, shall be recorded as the thickness specified in the design plus 1/4 inch (6.4 mm).~~

1704.10.4.1 Minimum allowable thickness. For design thicknesses 1 inch (25 mm) or greater, the minimum allowable individual thickness shall be the design thickness minus 1/4 inch (6.4 mm). For design thicknesses less than 1 inch (25 mm), the minimum allowable individual thickness shall be the design thickness minus 25 percent. Thickness shall be determined in accordance with ASTM E 605. Samples of the sprayed fire-resistant materials shall be selected in accordance with Sections ~~1704.10.4.1~~ 1704.10.4.2 and ~~1704.10.4.2~~ 1704.10.4.3.

~~1704.10.4.1~~ **1704.10.4.2 Floor, roof and wall assemblies.** The thickness of the sprayed fire-resistant material applied to floor, roof and wall assemblies shall be determined in accordance with ASTM E 605, taking ~~the average minus two times the standard deviation of the thickness measurements~~ of not less than four measurements for each 1,000 square feet (93m²) of the sprayed area on each floor or part thereof.

~~1704.10.4.1.1~~ **1704.10.4.2.1 Flat decks.** Thickness measurements shall be taken from a 12 inches (305 mm) square with a minimum of four measurements, symmetrically.

~~1704.10.4.1.2~~ **1704.10.4.2.2 Fluted decks.** Thickness measurements shall be taken from a 12 inches (305 mm) square with four random, symmetrical measurements within the square, including one each of the following: valley, crest and sides and report as an average.

~~1704.10.4.2~~ **1704.10.4.3 Structural framing members.** The thickness of the sprayed fire-resistant material applied to structural members shall be determined in accordance with ASTM E 605. Thickness testing shall be performed on not less than 25 percent of the structural members on each floor.

~~1704.10.4.2.1~~ **1704.10.4.3.1 Beams.** Thickness measurements shall be made at nine locations around the beam at each end of a 12 inches (305 mm) length.

~~1704.10.4.2.2~~ **1704.10.4.3.2 Joists and trusses.** Thickness measurements shall be made at seven locations around the joist or truss at each end of a 12 inches (305 mm) length.

~~1704.10.4.2.3~~ **1704.10.4.3.3 W-shape columns.** Thickness measurements shall be made at 12 locations around the column at each end of a 12 inches (305 mm) length.

~~1704.10.4.2.4~~ **1704.10.4.3.4 Tube and pipe columns.** Thickness measurements shall be made at a minimum of four locations around the column at each end of a 12 inches (305 mm) length.

1704.10.5 Density. The density of the sprayed fire-resistant material shall not be less than the density specified in the approved fire-resistant design. Density of the sprayed fire-resistant material shall be determined in accordance with ASTM E 605. The test samples for determining the density of the sprayed fire-resistant materials shall be selected as follows:

1. From each floor, roof and wall assembly at the rate of not less than one sample for every 2,500 square feet (232 m²) or part thereof of the sprayed area in each story.
2. From beams, girders, joists, trusses and columns at the rate of not less than one sample for each type of structural framing member for each 2,500 square feet (232 m²) of floor area or part thereof in each story.

1704.10.6 Bond strength. The cohesive/adhesive bond strength of the cured sprayed fire-resistant material applied to structural elements shall not be less than 150 pounds per square foot (psf) (7.18 kN/m²). The cohesive/adhesive bond strength shall be determined in accordance with the field test specified in ASTM E 736 by testing in-place samples of the sprayed fire-resistant material selected in accordance with Sections 1704.10.6.1 through 1704.10.6.3.

1704.10.6.1 Floor, roof and wall assemblies. The test samples for determining the cohesive/adhesive bond strength of the sprayed fire-resistant materials shall be selected from each floor, roof and wall assembly at the rate of not less than one sample for every 2,500 square feet (232 m²) or part thereof of the sprayed area in each story.

1704.10.6.2 Structural framing members. The test samples for determining the cohesive/adhesive bond strength of the sprayed fire-resistant materials shall be selected from beams, girders, joists, trusses and columns at the rate of not less than one sample for each type of structural framing member for each 2,500 square feet (232 m²) of floor area or part thereof in each story.

1704.10.6.3 Primer, paint and encapsulant bond tests. Bond tests to qualify a primer, paint or encapsulant shall be conducted only when the fire-resistive coating is applied to a primed, painted or encapsulated surface for which acceptable bond-strength performance between these coatings and the fire resistive material has not been measured. A bonding agent approved by the SFRM manufacturer shall be applied to a primed, painted or encapsulated surface where the bond strengths are found to be below minimum required values.

Committee Reason: This proposal provides the details to allow for verification that the sprayed fire-resistant material is properly installed. Given the actions the committee has previously taken to assure that the materials are appropriately applied (FS100-06/07) and that the conditions during the application are appropriate (G68-06/07), the inspection is important to verify installation and to help assure proper performance. The modifications deleted the requirements that the acceptance of the inspection measurements be based upon the "standard deviation." Since this is intended as a means of field inspection, the connection to "standard deviation" was deleted and replaced by the 10 percent limitation. The intent of both the original and this revised text is to provide a 95 percent confidence level that the installed material exceeds the requirements. The committee did note that Section 1704.10.6 of the proposal does refer to the bond strength of 150 pounds. Based on the action taken with code change G68-06/07 a public comment which directs code users to the new Table 403.15 is needed for the high-rise buildings which require a greater bond strength.

Assembly Action:

None

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Philip Brazil, P.E., Reid Middleton, Inc, representing himself, requests Approval as Modified by this public comment.

Modify proposal as follows:

1704.10 Sprayed fire-resistant materials. Special inspections for sprayed fire-resistant materials applied to floor, roof and wall assemblies and structural elements members and decks shall be in accordance with Sections 1704.10.1 through 1704.10.6. Special inspections shall be based on the fire-resistance design as designated in the approved construction documents. The tests ~~described set forth~~ in this section shall be based on samplings of from specific floor, roof and wall assemblies, and structural framing members. Special inspections shall be performed after the rough installation of electrical, automatic sprinkler, mechanical and plumbing systems and suspension systems for ceilings systems, where applicable.

1704.10.1 Physical and visual tests. The special inspections shall include the following physical and visual tests and observations are required to demonstrate compliance with the listing and the fire-resistance rating:

1. Condition of substrates.
2. Thickness of application.
3. Density in pounds per cubic foot (~~lbs per m³~~ kg/m³).
4. Bond strength-adhesion/cohesion.
5. Condition of finished application.

1704.10.2 Structural member surface conditions. The surfaces shall be prepared in accordance with the approved fire-resistance design and the ~~approved manufacturer's~~ written instructions of approved manufacturers. The prepared surface of structural members to be sprayed shall be inspected before the application of the sprayed fire-resistant material.

1704.10.3 Application. The substrate shall have a minimum ambient temperature before and after application as specified in the ~~approved manufacturer's~~ written instructions of approved manufacturers. The area for application shall be ventilated during and after application as required by the ~~approved manufacturer's~~ written instructions of approved manufacturers.

1704.10.4 Thickness. No more than 10 percent of the thickness measurements of the sprayed fire-resistant materials applied to floor, roof and wall assemblies and structural elements members shall be less than the thickness required by the approved fire-resistant resistance design but in no case less than the minimum allowable thickness required by Section 1704.10.4.1.

1704.10.4.1 Minimum allowable thickness. For design thicknesses 1 inch (25 mm) or greater, the minimum allowable individual thickness shall be the design thickness minus 1/4 inch (6.4 mm). For design thicknesses less than 1 inch (25 mm), the minimum allowable individual thickness shall be the design thickness minus 25 percent. Thickness shall be determined in accordance with ASTM E 605. Samples of the sprayed fire-resistant materials shall be selected in accordance with Sections 1704.10.4.2 and 1704.10.4.3.

1704.10.4.2 Floor, roof and wall assemblies. The thickness of the sprayed fire-resistant material applied to floor, roof and wall assemblies shall be determined in accordance with ASTM E 605, taking making not less than four measurements for each 1,000 square feet (93 m²) of the sprayed area ~~on each floor in each story or part portion thereof~~.

1704.10.4.2.1 Flat Cellular decks. Thickness measurements shall be ~~taken~~ selected from a square area, 12 inches (305 mm) square with a by 12 inches (305 mm) in size. A minimum of four measurements shall be made, located symmetrically within the square area.

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1704.10.4.2.2 Fluted decks. Thickness measurements shall be ~~taken~~ selected from a square area, 12 inches (305 mm) ~~square with by 12 inches (305 mm) in size.~~ A minimum of four ~~random, symmetrical~~ measurements shall be made, located symmetrically within the square area, including one each of the following: valley, crest and sides and report as an average.

1704.10.4.3 Structural framing members. The thickness of the sprayed fire-resistant material applied to structural members shall be determined in accordance with ASTM E 605. Thickness testing shall be performed on not less than 25 percent of the structural members on each floor.

1704.10.4.3.1 Beams and girders. At beams and girders, thickness measurements shall be made at nine locations around the beam or girder at each end of a ~~42 inches~~ 12-inch (305 mm) length.

1704.10.4.3.2 Joists and trusses. At joists and trusses, thickness measurements shall be made at seven locations around the joist or truss at each end of a ~~42 inches~~ 12-inch (305 mm) length.

1704.10.4.3.3 W-shape Wide-flanged columns. At wide-flanged columns, thickness measurements shall be made at 12 locations around the column at each end of a ~~42 inches~~ 12-inch (305 mm) length.

1704.10.4.3.4 Tube Hollow structural section and pipe columns. At hollow structural section and pipe columns, thickness measurements shall be made at a minimum of four locations around the column at each end of a ~~42 inches~~ 12-inch (305 mm) length.

1704.10.5 Density. The density of the sprayed fire-resistant material shall not be less than the density specified in the approved fire-~~resistant~~ resistance design. Density of the sprayed fire-resistant material shall be determined in accordance with ASTM E 605. The test samples for determining the density of the sprayed fire-resistant materials shall be selected as follows:

1. From each floor, roof and wall assembly at the rate of not less than one sample for every 2,500 square feet (232 m²) or part portion thereof of the sprayed area in each story.
2. From beams, girders, ~~joists,~~ trusses and columns at the rate of not less than one sample for each type of structural ~~framing~~ member for each 2,500 square feet (232 m²) of floor area or part portion thereof in each story.

1704.10.6 Bond strength. The cohesive/adhesive bond strength of the cured sprayed fire-resistant material applied to floor, roof and wall assemblies and structural elements members shall not be less than 150 pounds per square foot (psf) (7.18 kN/m²). The cohesive/adhesive bond strength shall be determined in accordance with the field test specified in ASTM E 736 by testing in-place samples of the sprayed fire-resistant material selected in accordance with Sections 1704.10.6.1 through 1704.10.6.3.

1704.10.6.1 Floor, roof and wall assemblies. The test samples for determining the cohesive/adhesive bond strength of the sprayed fire-resistant materials shall be selected from each floor, roof and wall assembly at the rate of not less than one sample for every 2,500 square feet (232 m²) ~~or part thereof~~ of the sprayed area in each story or portion thereof.

1704.10.6.2 Structural framing members. The test samples for determining the cohesive/adhesive bond strength of the sprayed fire-resistant materials shall be selected from beams, girders, ~~joists,~~ trusses, and columns and other structural members at the rate of not less than one sample for each type of structural ~~framing~~ member for each 2,500 square feet (232 m²) of floor area or part portion thereof in each story.

1704.10.6.3 Primer, paint and encapsulant bond tests. Bond tests to qualify a primer, paint or encapsulant shall be conducted ~~only~~ when the ~~fire-resistive coating~~ sprayed fire-resistant material is applied to a primed, painted or encapsulated surface for which acceptable bond-strength performance between these coatings and the fire ~~resistive~~ resistant material has not been ~~measured~~ determined. A bonding agent approved by the SFRM manufacturer shall ~~be~~ applied to a primed, painted or encapsulated surface where the bond strengths are found to be ~~below~~ minimum less than required values.

Commenter's Reason: The purpose for this public comment is to make editorial revisions to Proposal S38. "Structural elements and decks" in Section 1704.10 and "structural elements" in Sections 1704.10.4 and 1704.10.6 are changed to "floor, roof and wall assemblies and structural members" for consistency with Section 714 on the fire-resistance rating of structural members and for consistency with Sections 1704.10, 1704.10.4.2, 1704.10.3 and 1704.10.6.1 on "floor, roof and wall assemblies." "Structural framing members" are changed to "structural members" in Sections 1704.10 and 1704.10.6.2 for the same reason. Replacing "decks" with "floor, roof and wall assemblies" is also more comprehensive and takes into account special steel plate shear walls (i.e., Table 12.2-1 of ASCE 7-05).

Several other changes to Section 1704.10 are proposed. "Described" is changed to "set forth" to avoid non-mandatory language. "Sprinkler" is changed to "automatic sprinkler" for consistency with the terminology in Section 903 on automatic sprinkler systems. "Suspension for ceiling systems" is changed to "suspension systems for ceilings" for consistency with ASTM C 635 and C 636 on suspension systems for acoustical tile and lay-in panel ceilings, which are referenced in Section 803.9.1.1.

In Section 1704.10.1, "physical and visual tests" are replaced with "tests and observations" because Items #1 and #5 of Section 1704.10.1 are not accomplished by tests, but by the observations of the special inspector. In Section 1704.10.4, "fire-resistant design" is changed to "fire-resistance design" for consistency with Item #1 of Section 703.3, "fire-resistance designs documented in approved sources." In Section 1704.10.4.2, "on each floor" is changed to "in each story" for consistency with Section 1704.10.6.1. In Section 1704.10.4.3.1, "beams" is changed to "beams and girders" for consistency with the use of "beams" and "girders" in Section 1704.10.6.2. In Sections 1704.10.4.2, 1704.10.6.1 and 1704.10.6.2, "part" is changed to "portion" because area, not a structural element, is typically referenced.

The proposed revisions to Sections 1704.10.4.2.1, 1704.10.4.2.2 and 1704.10.4.3.1 through 1704.10.4.3.4 are intended to bring technical soundness to the provisions and to employ terms more commonly used by the structural engineering profession for the design of structural steel and by nationally recognized testing laboratories in their listings of fire-resistance-rated designs containing sprayed fire-resistant materials. "Flat deck" is changed to "cellular deck" for consistency with the same term used for fluted steel decks with steel sheet added to form flat bottom surfaces. "Random, symmetrical" is replaced by "symmetrical" because symmetrical measurements are not random, they are intentional. References to the subject of Sections 1704.10.4.3.1 through 1704.10.4.3.4 are added to the text because these sections, as written, rely on the title of each section for their charging language. "Tube columns" are changed to "hollow structural section columns" for consistency with current AISC terminology. The language is revised to consistently "select" measurements from specific areas and "make," not "take," the measurements in these areas. "Taking measurements implies sampling whereas measurements (i.e., thickness) are typically nondestructive.

In Section 1704.10.4.3.3, "W-shape columns" are changed to "wide-flanged columns" for consistency with Section 714.8.3.2 in Proposal FS100-06/07. Note that W-shaped, M-shaped, S-shaped and HP-shaped structural steel columns are manufactured. The current AISC Specification (AISC 360-05) typically refers to "I-shaped members" (i.e., Chapter F). The 2005 AISC Steel Construction Manual, however, typically refers to W-shapes, M-shapes, S-shapes and HP-shapes, which are described collectively as "H-shaped" and "I-shaped" (i.e., Scope).

Because of this level of detail, relying on "W-shape columns" in Section 1704.10.4.3.3 can lead to considerable confusion that can be avoided by use of the more generic "wide-flanged columns."

Several other changes to Section 1704.10.6.3 are proposed. "Fire-resistive coating" is changed to "sprayed fire-resistant material" for consistency with the other provisions in Section 1704.10. Note that special inspection of mastic and intumescent fire-resistant coatings is specified in Section 1704.11. "Fire-resistive material" is changed to "fire-resistant material," also for consistency with the other provisions in Section 1704.10. "Measured" is changed to "determined" because it refers to "acceptable bond strength performance," not the results of tests.

Final Hearing Results

S39-06/07

AMPC1

Code Change No: **S42-06/07**

Original Proposal

Section: 1707.7

Proponent: Philip Brazil, P.E., Reid Middleton, Inc., representing himself

Revise as follows:

1707.7 Architectural components. Periodic special inspection during the erection and fastening of exterior cladding, interior and exterior nonbearing walls and interior and exterior veneer in structures assigned to Seismic Design Category D, E or F.

Exceptions:

1. Special inspection is not required for architectural components in structures 30 feet (9144 mm) or less in height.
2. Special inspection is not required for cladding and veneer weighing 5 psf (24.5N/m²) or less.
3. Special inspection is not required for interior nonbearing walls weighing 15 psf (73.5 N/m²) or less.
4. Special inspection is not required for exterior cladding and exterior veneer 30 feet (9144 mm) or less in height above grade.

Reason: In Seismic Design Categories, D, E and F, Section 1707.7 specifies periodic special inspection during the erection and fastening of certain types of architectural components provided certain thresholds are reached. Currently, the charging statement specifies special inspection for exterior cladding, interior and exterior nonbearing walls and interior and exterior veneer. Exception 1, however, exempts architectural components, which are not specified in the charging statement. Presumably, referring to architectural components does not imply that Section 1707.7 applies to architectural components other than exterior cladding, interior and exterior nonbearing walls and interior and exterior veneer (i.e., interior cladding). Exception 2 exempts cladding and veneer weighing 5 psf or less from special inspection. Presumably, referring to cladding and veneer does not imply that Section 1707.7 applies to interior cladding. Exception 3 exempts interior nonbearing walls, but not exterior nonbearing walls, weighing 15 psf or less from special inspection. In summary, for all structures more than 30 feet in height, periodic special inspection is required for the erection and fastening of (1) all exterior nonbearing walls, (2) all exterior cladding and interior and exterior veneer weighing more than 5 psf, and (3) all interior nonbearing walls weighing more than 15 psf.

The current provisions create several unintended consequences. For example, at a structure more than 30 feet in height, special inspection is required, for example, at anchored brick masonry veneer supported by a concrete foundation and extending from finish grade to a few feet above grade (i.e., wainscot). For the same structure, special inspection is not required for any exterior cladding, interior veneer or exterior veneer weighing less than 5 psf, or for any interior nonbearing walls weighing less than 15 psf, but it is required for all of the exterior nonbearing walls. Special inspection is also required for all exterior cladding, interior veneer and exterior veneer weighing more than 5 psf, and for all interior nonbearing walls weighing more than 15 psf, no matter how close the component is to the ground surface (exterior cladding and veneer) or to the floor surface (interior veneer and nonbearing walls). The current requirements for periodic special inspection are summarized in the table below.

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	Exterior Cladding	Nonbearing Walls		Veneer	
		Interior	Exterior	Interior	Exterior
Structure ≤ 30'0"	No	No	No	No	No
Structure > 30'0" and Exterior Component ≤ 30'0":					
Component ≤ 5 psf	No	No	No	No	No
5 psf < Component ≤ 15 psf	Yes	No	Yes	Yes	Yes
Component > 15 psf	Yes	Yes	Yes	Yes	Yes
Structure > 30'0" and Exterior Component > 30'0":					
Component ≤ 5 psf	No	No	No	No	No
5 psf < Component ≤ 15 psf	Yes	No	Yes	Yes	Yes
Component > 15 psf	Yes	Yes	Yes	Yes	Yes

The proposed changes will establish thresholds for requiring special inspection that are more consistent with the relative risk posed by exterior cladding, interior and exterior nonbearing walls and interior and exterior veneer in Seismic Design Categories, D, E and F. As modified by the proposal, the requirements for periodic special inspection are summarized in the table below. Differences with the current requirements are highlighted in bold.

	Exterior Cladding	Nonbearing Walls		Veneer	
		Interior	Exterior	Interior	Exterior
Structure ≤ 30'0"	No	No	No	No	No
Structure > 30'0" and Exterior Component ≤ 30'0":					
Component ≤ 5 psf	No	No	No	No	No
5 psf < Component ≤ 15 psf	No	No	No	Yes	No
Component > 15 psf	No	Yes	Yes	Yes	No
Structure > 30'0" and Exterior Component > 30'0":					
Component ≤ 5 psf	No	No	No	No	No
5 psf < Component ≤ 15 psf	Yes	No	No	Yes	Yes
Component > 15 psf	Yes	Yes	Yes	Yes	Yes

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The proposed change was disapproved at the request of the proponent who intends to submit a modified proposal.

Assembly Action:

None

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Philip Brazil, P.E., S.E., Reid Middleton, Inc., representing himself, requests Approval as Modified by this public comment.

Replace proposal with the following:

1707.7 Architectural components. Periodic special inspection during the erection and fastening of exterior cladding, interior and exterior nonbearing walls and interior and exterior veneer in structures assigned to Seismic Design Category D, E or F.

Exceptions:

1. Special inspection is not required for ~~architectural components in structures~~ cladding, nonbearing walls and veneer 30 feet (9144 mm) or less in height above grade or walking surface.
2. Special inspection is not required for cladding and veneer weighing 5 psf (24.5N/m²) or less.
3. Special inspection is not required for interior nonbearing walls weighing 15 psf (73.5 N/m²) or less.

Commenter's Reason: The public comment will align Section 1707.7 with Section 2.3.9 of the NEHRP Recommended Provisions for Seismic Regulations for New Buildings and Other Structures (FEMA 450) and achieve better consistency with Section 11A.1.3.9 of ASCE 7-05. As modified by this public comment, the requirements for periodic special inspection are summarized in the table below. Differences between the public comment and the current proposal are highlighted in **bold**.

	Exterior Cladding	Nonbearing Walls		Veneer	
		Interior	Exterior	Interior	Exterior
Structure ≤ 30'0"	No	No	No	No	No
Structure > 30'0" and Exterior Component ≤ 30'0":					
Component ≤ 5 psf	No	No	No	No	No
5 psf < Component ≤ 15 psf	No	No	No	No	No
Component > 15 psf	No	No	No	No	No
Structure > 30'0" and Exterior Component > 30'0":					
Component ≤ 5 psf	No	No	Yes	No	No
5 psf < Component ≤ 15 psf	Yes	No	Yes	Yes	Yes
Component > 15 psf	Yes	Yes	Yes	Yes	Yes

Although the title of Section 1707.7 is "architectural components," the charging language of Section 1707.7 does not specify architectural components. Rather, it specifies exterior cladding, interior and exterior nonbearing walls and interior and exterior veneer, which are examples of architectural components but are not the only types of architectural components. Architectural components other than exterior cladding, interior and exterior nonbearing walls and interior and exterior veneer are not subject to the requirements of Section 1707.7.

Final Hearing Results

S42-06/07

AMPC1

Code Change No: S44-06/07

Original Proposal

Section: 1708 (New)**Proponent:** Philip Brazil, P.E., Reid Middleton, Inc., representing himself**Add new text as follows:**

SECTION 1708
SPECIAL INSPECTIONS FOR WIND REQUIREMENTS

1708.1 Special inspections for wind requirements. Special inspections itemized in Sections 1708.2 and 1708.3, unless exempted by the exceptions to Section 1704.1, are required for buildings and structures constructed in the following areas:

1. In wind Exposure Category B, where the 3-second-gust basic wind speed is 120 miles per hour (52.8 m/sec) or greater.
2. In wind Exposure Categories C or D, where the 3-second-gust basic wind speed is 110 mph (49 m/sec) or greater.

1708.2 Structural wood. Continuous special inspection is required during field gluing operations of elements of the main wind-force-resisting system. Periodic special inspection is required for nailing, bolting, anchoring and other fastening of components within the main wind-force-resisting system, including wood shear walls, wood diaphragms, drag struts, braces and hold-downs.

Exception: Special inspection is not required for wood shear walls, shear panels and diaphragms, including nailing, bolting, anchoring and other fastening to other components of the main wind-force-resisting system, where the fastener spacing of the sheathing is more than 4 inches (102 mm) on center.

1708.3 Cold-formed steel framing. Periodic special inspection is required during welding operations of elements of the main wind-force-resisting system. Periodic special inspection is required for screw attachment, bolting, anchoring and other fastening of components within the main wind-force-resisting system, including struts, braces, and hold-downs.

(Renumber subsequent sections)

Reason: In areas of high seismic risk (i.e., Seismic Design Categories C, D, E and F), the IBC currently requires special inspection of seismic-force-resisting systems in buildings of light-frame construction (wood framing and cold-formed steel framing). The risk addressed by these requirements is equally present in areas of high wind forces and special inspection of main wind-force-resisting systems in buildings of light-frame construction is equally warranted. The purpose of this proposal is to establish these requirements in areas of high wind forces. This proposal is, in part, a response to comments made by the proponent during floor discussion of code change proposal S72-04/05 at the 2004/2005 code development hearings in Cincinnati.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: This code change is consistent with the current wind requirements in the statement of special inspection. It closes the loop and meets the intent of Section 1705.4.2.

Assembly Action:

None

Final Hearing Results

S44-06/07

AS

Code Change No: **S45-06/07**

Original Proposal

Section: 1708 (New)

Proponent: Philip Brazil, P.E., Reid Middleton, Inc., representing himself

Add new text as follows:

SECTION 1708
SPECIAL INSPECTIONS FOR WIND REQUIREMENTS

1708.1 Special inspections for wind requirements. Special inspections itemized in Section 1708.2, unless exempted by the exceptions to Section 1704.1, are required for buildings and structures constructed in the following areas:

1. In wind Exposure Category B, where the 3-second-gust basic wind speed is 120 miles per hour (52.8 m/sec) or greater.
2. In wind Exposure Categories C or D, where the 3-second-gust basic wind speed is 110 mph (49 m/sec) or greater.

1708.2 Wind-resisting components. Periodic special inspection is required for the following systems and components:

1. Roof cladding.
2. Wall cladding.

Reason: In areas of high seismic risk (i.e., Seismic Design Categories C, D, E and F), the IBC currently requires special inspection of seismic-force-resisting systems in buildings of light-frame construction (wood framing and cold-formed steel framing). The risk addressed by these requirements is equally present in areas of high wind forces and special inspection of main wind-force-resisting systems in buildings of light-frame construction is equally warranted. A related proposal addresses main wind-force-resisting systems. This proposal addresses the cladding on buildings and structures in areas of high wind forces. Damage to buildings due to high wind forces often begins with failure of the cladding system, which often exposes the main wind-force-resisting system to damage from wind-driven rain and other forces that the wind-force-resisting system is typically not designed to withstand.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing Results

Committee Action:**Approved as Submitted****Committee Reason:** This proposal completes the wind resistance special inspections and is consistent with the approval of S44-06/07.**Assembly Action:****None**

Final Hearing Results

S45-06/07

AS

Code Change No: S46-06/07

Original Proposal

Section: 1708.2**Proponent:** William W. Stewart, FAIA, Chesterfield, MO, representing himself**Revise as follows:****1708.2 Testing for seismic resistance.** The tests specified in sections 1708.3 through 1708.6 are required for the following:

1. The seismic-force-resisting systems in structures assigned to Seismic Design Category C, D, E or F, as determined in Section 1613.
2. ~~Designated seismic-Vibration isolated systems in structures assigned to Seismic Design Category C, D, E or F where the construction documents require a nominal clearance of 0.25 inches or less between the equipment support frame and restraint.~~
3. ~~Architectural, mechanical and electrical components in structures assigned to Seismic Design Category C, D, E or F that are required in Section 1708.5.~~

Reason: Based on the definition of designated seismic system in 1702, item 3 is redundant and can be deleted since it is a duplication of item 2.

There is a major fault with the pointer in the deleted item 3. Per item 3, 1708.5 is supposed to identify which designated seismic systems need Structural Testing. 1708.5 does not identify any components, therefore no designated seismic systems need Structural Testing. Based on Section 1708.5 I believe that the intent of item 3 was to cover mechanical equipment (mainly air handlers) that have spring mounted vibration isolators with snubbers. I have inserted text from item 5 of 1707.8 that describes those components.

Another way of looking at items 2 & 3; Item 2 currently says Structural Tests are necessary for all Designated Seismic Systems, which by definition are all architectural, mechanical and electrical components. Item 3, as explained above says no structural tests are necessary. Thus items 2 & 3 in conflict. If item 2 were correct, every partition, ceiling, light fixture, etc. that has an I_p greater than 1.0 would need Structural Testing. . This is obviously overkill. Item 3 is the intent of the code.

Seismic Design Category C was added to the retained exception since it was in deleted item 3.

Section 1708.1 and 1707.1 seem to have the same origin. You will see a similar change to 1707.1. The pointer in item 3 of 1707.1 did point to systems that needed special inspections. This change to Section 1708.1 will put the systems that need structural testing directly in 1708.1 and then refer to the qualification and testing as outlined in 1708.5.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:**Approved as Modified****Modify the proposal as follows:****1708.2 Testing and qualification for seismic resistance.** The ~~tests testing and qualification~~ specified in sections 1708.3 through 1708.6 are required ~~for the following as follows:~~

1. The seismic-force-resisting systems in structures assigned to Seismic Design Category C, D, E or F, as determined in Section 1613 shall meet the requirements of Sections 1708.3 and 1708.4, as applicable.

2. Designated seismic systems in structures assigned to Seismic Design Category D, E or F in Section 13.2.2 of ASCE 7 shall meet the requirements of Section 1708.5.
3. Architectural, mechanical and electrical components in structures assigned to Seismic Design Category C, D, E or F with an $I_p = 1.0$ shall be permitted to be seismically qualified by meeting the requirements of that are required in Section 1708.5.
4. The seismic isolation system in seismically isolated structures shall meet the testing requirements of Section 1708.6.

Committee Reason: This code change makes corrections to the organization of Section 1708.2 which lists items that require testing for seismic resistance. The modification provides consistency with the following sections that are referenced by Section 1708.2.

Assembly Action:

None

Final Hearing Results

S46-06/07

AM

Code Change No: **S47-06/07**

Original Proposal

Sections: 1702.1, 1709.1

Proponent: Philip Brazil, P.E., Reid Middleton, Inc., representing himself

Revise as follows:

1702.1 General. The following words and terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

STRUCTURAL OBSERVATION. The visual observation of the structural system by a registered design professional for general conformance to the approved construction documents ~~at significant construction stages and at completion of the structural system.~~ Structural observation does not include or waive the responsibility for the inspection required by Section 109, 1704 or other sections of this code.

1709.1 General. Where required by the provisions of Section 1709.2 or 1709.3, the owner shall employ a registered design professional to perform structural observations as defined in Section 1702.

Prior to the commencement of observations, the structural observer shall submit to the building official a written statement identifying the frequency and extent of structural observations.

At the conclusion of the work included in the permit, the structural observer shall submit to the building official a written statement that the site visits have been made and identify any reported deficiencies which, to the best of the structural observer's knowledge, have not been resolved.

Reason: The purpose of this proposal is to delete an inappropriate phrase from the definition of structural observation. A definition should specify the meaning of the term being defined. If there are technical requirements associated with use of the term, they should be located elsewhere. The current definition of structural observation includes when visual observation by the structural observer shall occur: at significant construction stages and at completion of the structural system. These are technical requirements related to the frequency of observations, which should be placed elsewhere in the IBC. But if such requirements were located elsewhere, they should be substantially altered from their present form. A requirement for visual observation to occur at "significant construction stages" is vague and unenforceable, which is not appropriate for a regulatory document such as the IBC. The determination of the frequency of structural observations by the structural observer is best left to the structural observer and the owner in consultation with the local building official.

In place of the deleted language from the definition for structural observation, the proposal adds a requirement in Section 1709.1 for submittal of a written statement by the structural observer to the building official prior to the commencement of observations identifying the frequency and extent of structural observations. Requiring the submittal prior to commencement of construction authorized by the building permit is avoided because the structural observer will not necessarily know when construction begins and should not be expected to meet a deadline established by others beyond his or her control.

Note that the owner is required to employ a registered design professional to perform structural observation when required by Section 1709.2 or 1709.3. The structural observer, in turn, is required to submit a written statement to the building official at the conclusion of the work included in the permit (see Section 1709.1). Note also that one of the conditions for structural observation by a registered design professional is when so designated by the registered design professional in responsible charge of the design, which is typically the architect of record. See condition #4 in Sections 1709.2 and 1709.3.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: This code change will improve construction quality by requiring identification of the frequency and extent of structural observations.

Assembly Action:

None

Final Hearing Results

S47-06/07

AS

Code Change No: S48-06/07

Original Proposal

Section: 1714.5.2, Chapter 35

Proponent: Joseph R. Hetzel, P.E., Door & Access Systems Manufacturers Association

1. Revise as follows:

1714.5.2 Exterior windows and door assemblies not provided for in Section 1714.5.1. Exterior window and door assemblies shall be tested in accordance with ASTM E 330. Structural performance of garage doors shall be determined in accordance with either ASTM E 330 or ANSI/DASMA 108, and shall meet the acceptance criteria of ANSI/DASMA 108. Exterior window and door assemblies containing glass shall comply with Section 2403. The design pressure for testing shall be calculated in accordance with Chapter 16. Each assembly shall be tested for 10 seconds at a load equal to 1.5 times the design pressure.

2. Add standard to Chapter 35 as follows:

DASMA

ANSI/DASMA 108-02, Standard Method for Testing Sectional Garage Doors: Determination of Structural Performance Under Uniform Static Air Pressure Difference

Reason: The purpose of this proposed code change is to reference an ANSI standard published specifically for the static air pressure testing of garage doors. ANSI/DASMA 108 includes garage door acceptance criteria, which is not contained within ASTM E 330. Similar language to what is being proposed is contained in 2006 IRC Section R613.5.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: Results of review of the proposed standard(s) will be posted on the ICC website by August 20, 2006.

Public Hearing Results

Note: The following analysis was not in the Code Change Proposal book but was published in the "Errata to the 2006/2007 Proposed Changes to the International Codes and Analysis of Proposed Referenced Standards" provided at the code development hearings:

Analysis: Review of proposed new standard indicated that, in the opinion of ICC staff, the standard did comply with ICC criteria for referenced standards.

Committee Action:

Approved as Submitted

Committee Reason: The proposal appropriately adds an additional test standard that is specific to garage doors.

Assembly Action:

None

Final Hearing Results

S48-06/07

AS

Code Change No: **S51-06/07**

Original Proposal

Section: 1808.2.23.1

Proponent: Philip Brazil, P.E., Reid Middleton, Inc., representing himself

Revise as follows:

1808.2.23.1 Seismic Design Category C. Where a structure is assigned to Seismic Design Category C in accordance with Section 1613, the following shall apply. Individual pile caps, piers or piles shall be interconnected by ties. Ties shall be capable of carrying, in tension and compression, a force equal to the product of the larger pile cap or column load times the seismic coefficient, S_{DS} , divided by 10 unless it can be demonstrated that equivalent restraint is provided by reinforced concrete beams within slabs on grade or reinforced concrete slabs on grade or confinement by competent rock, hard cohesive soils or very dense granular soils.

Exception: ~~In Group R-3 and U occupancies of light-frame construction, piers foundations supporting foundation walls, isolated interior posts detailed so the pier is not subject to lateral loads, or lightly loaded exterior decks and patios, of Group R-3 and U occupancies not exceeding two stories of light frame construction,~~ are not subject to interconnection if it can be shown the soils are of adequate stiffness, subject to the approval of the building official.

Reason: The current language was approved as submitted by code change proposal 1807.2.23.1 at the IBC First Draft Public Hearings in April, 1998. The staff analysis following the reason statement indicated that the "exception to Section 1807.2.23.1 is not understandable in its current format. Itemizing each individual condition is suggested." I agree. The purpose of this proposal is to modify the exception to Section 1808.2.23.1 so that it is understandable to the average code user and to the proponent of this proposal. The change from "piers" to "pier foundations" is for consistency with the definition of "pier foundation" in Section 1808.1. The phrase "lightly loaded" is deleted because the language is vague and unenforceable.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: This code change makes the exception to interconnecting pier foundations in Group R-3 occupancies more understandable.

Assembly Action:

None

Final Hearing Results

S51-06/07

AS

Code Change No: **S52-06/07**

Original Proposal

Section: 1808.2.23.2.1

Proponent: Michael Valley, Magnusson Klemencic Associates representing Structural Engineers Association of Washington Earthquake Engineering Committee

Revise as follows:

1808.2.23.2.1 Design details for piers, piles and grade beams. Piers or piles shall be designed and constructed to withstand maximum imposed curvatures from earthquake ground motions and structure response. Curvatures shall include free-field soil strains modified for soil-pile-structure interaction coupled with pier or pile deformations induced by lateral pier or pile resistance to structure seismic forces. Concrete piers or piles on Site Class E or F sites, as determined in Section 1613.5.2, shall be designed and detailed in accordance with Sections 21.4.4.1, 21.4.4.2 and 21.4.4.3 of ACI 318 within seven pile diameters of the pile cap and the interfaces of soft to medium stiff clay or liquefiable strata. For precast prestressed concrete piles, detailing provisions as given in Section 1809.2.3.2.1 and 1809.2.3.2.2 shall apply.

~~Grade beams shall be designed as beams in accordance with~~ comply with the provisions in Section 21.10.3 of ACI 318 for grade beams, except where they, Chapter 21. ~~When grade beams have the capacity to resist the forces from the load combinations in Section 1605.4, they need not conform to ACI 318, Chapter 21.~~

Reason: Clarify the Code. This change clarifies the intent of the design requirement for grade beams in the last paragraph of the section. The provision currently requires grade beams to be designed as "beams" (not "grade beams") in accordance with Chapter 21 of ACI 318. Chapter 21 of ACI 318 has design provisions for grade beams (21.10.3), beams in special moment frames (21.3), coupling beams (21.7.7), and beams in intermediate moment frames (21.12.4). The revised text indicates which requirements apply.

This clarification makes the text similar to that in Section 14.2.7.2.2 of ASCE 7-05.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The proposal clarifies where grade beams need to comply with the referenced provision in ACI 318.

Assembly Action:

None

Final Hearing Results

S52-06/07

AS

Code Change No: **S53-06/07**

Original Proposal

Section: 1808.2.23.2.1

Proponent: Michael Valley, Magnusson Klemencic Associates, representing Structural Engineers Association of Washington Earthquake Engineering Committee

Revise as follows:

1808.2.23.2.1 Design details for piers, piles and grade beams. Piers or piles on Site Class E or F sites, as determined in Section 1613.5.2, shall be designed and constructed to withstand maximum imposed curvatures from earthquake ground motions and structure response. Curvatures shall include free-field soil strains modified for soil-

pile-structure interaction coupled with pier or pile deformations induced by lateral pier or pile resistance to structure seismic forces. ~~Where constructed of nonprestressed Cconcrete, such piers or piles on Site Class E or F sites, as determined in Section 1613.5.2,~~ shall be designed and detailed in accordance with Sections 21.4.4.1, 21.4.4.2 and 21.4.4.3 of ACI 318 within seven pile diameters of the pile cap and within seven pile diameters of the interfaces of strata that are hard or stiff and soft to medium stiff clay or strata that are liquefiable or are composed of soft to medium stiff clay strata.

Exception: Piers or piles that satisfy the following additional detailing requirements shall be deemed to comply with the curvature capacity requirements of this section.

1. ~~For~~ Precast prestressed concrete piles, ~~detailed in provisions as given in accordance with Section 1809.2.3.2.1 and 1809.2.3.2.2 shall apply.~~
2. Cast-in-place concrete piles with a minimum longitudinal reinforcement ratio of 0.005 extending throughout the region detailed in accordance with Sections 21.4.4.1, 21.4.4.2 and 21.4.4.3 of ACI 318, but not less than the length required in Section 1810.1.2.2.

Grade beams shall be designed as beams in accordance with ACI 318, Chapter 21. When grade beams have the capacity to resist the forces from the load combinations in Section 1605.4, they need not conform to ACI 318, Chapter 21.

Reason: Revise the scope of these additional pile analysis requirements. Clarify the portions of piles affected. Clarify the exception for precast prestressed piles. Add an exception for prescriptively detailed cast-in-place concrete piles.

Design for "pier or pile moments, shears and lateral deflections" is already required by Section 1808.2.23.1.2, and ductile detailing within three pile diameters of the pile cap is already required by Sections 1809.2.2.2.2 and 1810.1.2.2. The requirements of Section 1808.2.23.2.1, which add to those requirements, are taken from the NEHRP *Recommended Provisions* and are motivated by concern with pile response in soft or liquefiable soils (extended hinging region and kinematic interaction), as indicated in the NEHRP *Commentary* copied below. Such soils are assigned to Site Class E or F, as indicated in IBC Table 1615.1.1, so the corresponding additional requirements should be scoped accordingly.

At present this section applies to all buildings on piers or piles for all site classes, but that scope is inconsistent with both the rationale for the requirement and the state-of-the-practice. Requiring all geotechnical engineers to address the kinematic interaction issue for all projects will result in a large range of response ranging from nothing to potential recommendations for more expensive foundation types that don't significantly reduce societal risk.

As indicated in the NEHRP *Commentary* copied below, properly detailed piles provide the desired performance. For nonprestressed concrete piles, such proper detailing is defined in Sections 21.4.4.1, 21.4.4.2 and 21.4.4.3 of ACI 318. For precast prestressed piles, such proper detailing is defined in Section 1809.2.3.2.2 (which adds to the requirements in 1809.2.3.2.1). The section as modified maintains those detailing requirements and clarifies that this special detailing addresses the requirement related to "maximum imposed curvature."

The text defining the soil interfaces of concern is revised for clarity based on Section 14.2.7.2.1 of ASCE 7-05.

Commentary to the 2003 NEHRP *Recommended Provisions* Section 7.5.4 [emphasis added]:

Special consideration is required in the design of concrete piles subject to significant bending during earthquake shaking. Bending can become crucial to pile design where portions of the foundation piles are supported in soils such as **loose granular materials and/or soft soils** that are susceptible to large deformations and/or strength degradation. Severe pile bending problems may result from various combinations of soil conditions during strong ground shaking, for example:

1. Soil settlement at the pile-cap interface either from consolidation of **soft soil** prior to the earthquake or from soil compaction during the earthquake can create a free-standing short column adjacent to the pile cap.
2. Large deformations and/or reduction in strength resulting from **liquefaction of loose granular materials** can cause bending and/or conditions of free-standing columns.
3. Large deformations in **soft soils** can cause varying degrees of pile bending. The degree of pile bending will depend upon thickness and strength of the soft soil layer(s) and/or the properties of the soft/stiff soil interface(s).

Such conditions can produce shears and/or curvatures in piles that may exceed the bending capacity of conventionally designed piles and result in severe damage. ...

The desired foundation performance can be accomplished by **proper selection and detailing** of the pile foundation system. Such design should accommodate bending from both reaction to the building's inertial loads and those induced by the motions of the soils themselves. Examples of designs of concrete piles include:

1. Use of a **heavy spiral reinforcement** and
2. Use of exterior steel liners to confine the concrete in the zones with large curvatures or shear stresses.

These provide proper confinement to ensure adequate ductility and maintenance of functionality of the confined core of the pile during and after the earthquake.

Precast prestressed concrete piles are exempted from the concrete special moment frame detailing requirements adapted for concrete piles since these provisions were never intended for slender precast prestressed concrete elements and will result in unbuildable piles. Piles with substantially less confinement reinforcement than required by ACI 318 equation 10-6 have been proven through cyclic testing to have adequate performance (Park and Hoat Joen, 1990).

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: This proposal provides guidance to engineers on the additional pile analysis requirements for structures that are classified as Seismic Design Category D, E or F.

Assembly Action:

None

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

John Diebold, Structural Engineers Association of California, SEAOC Seismology Committee, requests Approval as Modified by this public comment.

Modify proposal as follows:

1808.2.23.2.1 Design details for piers, piles and grade beams. Piers or piles on Site Class E or F sites, as determined in Section 1613.5.2, shall be designed and constructed to withstand maximum imposed curvatures from earthquake ground motions and structure response. Curvatures shall include free-field soil strains modified for soil-pile-structure interaction coupled with pier or pile deformations induced by lateral pier or pile resistance to structure seismic forces. ~~Where constructed of nonprestressed concrete such piers or piles shall be designed and detailed in accordance with Sections 21.4.4.1, 21.4.4.2 and 21.4.4.3 of ACI 318 within seven pile diameters of the pile cap and within seven pile diameters of the interfaces of strata that are hard or stiff and strata that are liquefiable or are composed of soft to medium stiff clay.~~

Exception: Piers or piles that satisfy the following additional detailing requirements shall be deemed to comply with the curvature capacity requirements of this section.

1. Precast prestressed concrete piles detailed in accordance with Section 1809.2.3.2.2.
2. Cast-in-place concrete piles with a minimum longitudinal reinforcement ratio of 0.005 ~~extending the full length of the pile extending throughout the region and detailed in accordance with Sections 21.4.4.1, 21.4.4.2 and 21.4.4.3 of ACI 318 as required by this section, but not less than the length required in Section 1810.1.2.2.~~

~~Where constructed of nonprestressed concrete such piers or piles shall be designed and detailed in accordance with Sections 21.4.4.1, 21.4.4.2 and 21.4.4.3 of ACI 318 within seven pile diameters of the pile cap and within seven pile diameters of the interfaces of strata that are hard or stiff and strata that are liquefiable or are composed of soft to medium stiff clay.~~

Commenter-s Reason: The Structural Engineers Association of California Seismology Committee agrees with the intent and spirit of the original proposal.

There are two points of concern that our Structural Engineers of California Seismology Committee believes are valid and need to be addressed as indicated in this modification. They are as follows:

1. The 0.005 longitudinal reinforcing ratio for the pile should be for the full length of the pile and not just for the "area detailed". The reason for this is that without the curvature analysis, the actual required flexural length of the pile has not been determined - so the point where this reinforcing could be reduced is unclear. Placing this reinforcement throughout the pile length compensates for what is unknown. The original proposal does not adequately address this. See Further Elaboration of Point #1 below for further discussion.
2. The closer tie spacing requirement for the 7 pile diameters above and below the interface and below the pile cap should be stated such that it clearly also applies to Exception 2. Otherwise, our concern is that the way the original S53 proposal reads could be misinterpreted to mean that the exception takes away the requirement for the stricter tie spacing within the 7 pile diameter distance of the interface and the bottom of the pile cap.

This can be clarified by moving the following phrase after the exception, or placing the exception prior to this phrase:

"Where constructed of nonprestressed concrete, such piers or piles shall be designed and detailed in accordance with Sections 21.4.4.1, 21.4.4.2 and 21.4.4.3 of ACI 318 within seven pile diameters of the pile cap and within seven pile diameters of the interfaces of strata that are hard or stiff and strata that are liquefiable or are composed of soft to medium stiff clay."

Further Elaboration of Point #1:

The exception is intended to provide equivalence to the curvature analysis and curvature capacity requirements. Therefore, the intent to require the .005 reinforcement the entire length of the pile is to address the imposed curvatures, which would have been calculated by the kinematic analysis but is being "waived" by this exception.

The original proposal points to extending the longitudinal reinforcing a length that "should be not less than the length required in Section 1810.1.2.2". The original proposal does not provide clarity regarding the length of the vertical reinforcing, nor does it provide any added detailing requirement to justify not performing the curvature analysis. 1810.1.2.2 requires that the "flexural length" be known - which could be determinable for Site Class D, but requires the more complicated kinematic analysis for multiple strata associated with Site Class E or F.

Because we are attempting to address a complex field condition where there are differing soil strata that will impose curvatures on the pile, it makes sense to provide this minimum amount (.005) of "flexural" longitudinal reinforcement to provide a level of structural integrity. It should run the full length of the pile, because the analysis to determine the extent of the curvature has not been done per the exception.

Final Hearing Results

S53-06/07

AMPC1

Code Change No: **S54-06/07**

Original Proposal

Section: 1810.8

Proponent: Edwin T. Huston, Smith & Huston, Inc., representing National Council of Structural Engineering Associations

Revise as follows:

1810.8 Micropiles. Micropiles shall ~~conform to~~ comply with the requirements of Sections 1810.8.1 through 1810.8.5.

1810.8.1 Construction. Micropiles shall consist of a grouted section reinforced with steel pipe or steel ~~reinforcing reinforcement~~. Micropiles shall develop their load-carrying capacity through a bond zone in soil, bedrock or a combination of soil and bedrock. ~~The full length of the micropile shall contain either a steel pipe or steel reinforcement shall extend the full length of the micropile.~~

1810.8.2 Materials. Grout shall have a ~~28-day~~ specified compressive strength (f'_c) of not less than 4,000 psi (27.58 Mpa). The grout mix shall be designed and proportioned so as to produce a pumpable mixture. Reinforcement ~~steel~~ shall ~~be~~ consist of deformed reinforcing bars in accordance with ASTM A 615 Grade 60 or Grade 75 or ASTM A 722 Grade 150.

~~Pipe/casing The steel pipe shall have a minimum wall thickness of 3/16 inch (4.8 mm) and as required to meet. Splices shall comply with Section 1808.2.7. Pipe/casing The steel pipe shall meet the tensile requirements of be in accordance with ASTM A 252 Grade 3, except the minimum yield strength shall be as used in the design submittal [typically 50,000 psi to 80,000 psi (345 MPa to 552 MPa)] and minimum elongation shall be 15 percent.~~

1810.8.3 Allowable stresses. The allowable ~~design~~ compressive stress ~~on in the~~ grout shall not exceed 0.33 f'_c . The allowable ~~design~~ compressive stress ~~on in the~~ steel pipe and steel reinforcement shall not exceed the lesser of 0.4 F_y , ~~or and~~ 32,000 psi (220 Mpa). The allowable ~~design~~ tensile stress ~~for in the~~ steel reinforcement shall not exceed 0.60 F_y . The allowable ~~design~~ tensile stress ~~for in~~ the cement grout shall be zero.

1810.8.4 Reinforcement. For piles or portions of piles grouted inside a temporary or permanent casing or inside a hole drilled into bedrock or a hole drilled with grout, the steel pipe or steel reinforcement shall be designed to carry at least 40 percent of the design compression load. Piles or portions of piles grouted in an open hole in soil without temporary or permanent casing and without suitable means of verifying the hole diameter during grouting shall be designed to carry the entire compression load in the reinforcing steel. Where a steel pipe is used for reinforcement, the portion of the ~~cement~~ grout enclosed within the pipe is permitted to be included ~~at~~ in the determination of the allowable stress ~~of in~~ the grout.

1810.8.4.1 Seismic reinforcement. Where a structure is assigned to Seismic Design Category C, a permanent steel casing shall be provided from the top of the pile down a minimum of 120 percent times of the flexural length. ~~The flexural length shall be determined in accordance with Section 1808.4.~~ Where a structure is assigned to Seismic Design D, E or F, the pile shall be considered as an alternative system. ~~In~~ in accordance with Section 104.11, ~~the~~ The alternative pile system design, supporting documentation and test data shall be submitted to the building official for review and approval.

1810.8.5 Installation. The pile shall be permitted to be formed in a hole advanced by rotary or percussive drilling methods, with or without casing. The pile shall be grouted with a fluid cement grout. The grout shall be pumped through a tremie pipe extending to the bottom of the pile until grout of suitable quality returns at the top of the pile. The following requirements apply to specific installation methods:

1. For piles grouted inside a temporary casing, the reinforcing steel bars shall be inserted prior to withdrawal of the casing. The casing shall be withdrawn in a controlled manner with the grout level maintained at the top of the pile to ensure that the grout completely fills the drill hole. During withdrawal of the casing, the grout level inside the casing shall be monitored to check that the flow of grout inside the casing is not obstructed.
2. For a pile or portion of a pile grouted in an open drill hole in soil without temporary casing, the minimum design diameter of the drill hole shall be verified by a suitable device during grouting.
3. For piles designed for end bearing, a suitable means shall be employed to verify that the bearing surface is properly cleaned prior to grouting.

4. Subsequent piles shall not be drilled near piles that have been grouted until the grout has had sufficient time to harden.
5. Piles shall be grouted as soon as possible after drilling is completed.
6. For piles designed with casing a full length casing, the casing must shall be pulled back to the top of the bond zone and reinserted or some by other suitable means employed to assure grout coverage outside the casing.

Reason: Substitute revised material for current provision of the Code.

The purpose of this proposal is to make editorial improvements to the language, which was approved by code change proposal S121-04/05(AM). In Section 1810.8.2, compliance with Section 1808.2.7 is specified for the splices of the steel pipe, which is the subject of Section 1808.2.7. The current language requires the steel pipe, not the splices of the steel pipe, to comply with Section 1808.2.7.

Cost Impact: The code change proposal will not increase the cost of construction

Public Hearing Results

Committee Action:

Approved as Modified

Modify the proposal as follows:

1810.8 Micropiles. Micropiles shall comply with the requirements of Sections 1810.8.1 through 1810.8.5.

1810.8.1 Construction. Micropiles shall consist of a grouted section reinforced with steel pipe or steel reinforcement. Micropiles shall develop their load-carrying capacity through a bond zone in soil, bedrock or a combination of soil and bedrock. The steel pipe or steel reinforcement shall extend the full length of the micropile.

1810.8.2 Materials. Grout shall have a specified compressive strength (f'c) of not less than 4,000 psi (27.58 Mpa). The grout mix shall be designed and proportioned so as to produce a pumpable mixture. Reinforcement shall consist of deformed reinforcing bars in accordance with ASTM A 615 Grade 60 or Grade 75 or ASTM A 722 Grade 150.

The steel pipe shall have a minimum wall thickness of 3/16 inch (4.8 mm). Splices shall comply with Section 1808.2.7. The steel pipe shall be in accordance with ASTM A 252 Grade 3, ~~except they have a minimum yield strength shall be as used in the design submittal exceeding 45,000 p.s.i. (310 MPa) and a minimum elongation shall be of 15 percent as shown by mill certifications or two coupon test samples per 40 000 pounds (kg) of pipe.~~

1810.8.3 Allowable stresses. The allowable compressive stress in the grout shall not exceed 0.33 f'c. The allowable compressive stress in the steel pipe and steel reinforcement shall not exceed the lesser of 0.4 Fy, and 32,000 psi (220 Mpa). The allowable tensile stress in the steel reinforcement shall not exceed 0.60 Fy. The allowable tensile stress in the cement grout shall be zero.

1810.8.4 Reinforcement. For piles or portions of piles grouted inside a temporary or permanent casing or inside a hole drilled into bedrock or a hole drilled with grout, the steel pipe or steel reinforcement shall be designed to carry at least 40 percent of the design compression load. Piles or portions of piles grouted in an open hole in soil without temporary or permanent casing and without suitable means of verifying the hole diameter during grouting shall be designed to carry the entire compression load in the reinforcing steel. Where a steel pipe is used for reinforcement, the portion of the grout enclosed within the pipe is permitted to be included in the determination of the allowable stress in the grout.

1810.8.4.1 Seismic reinforcement. Where a structure is assigned to Seismic Design Category C, a permanent steel casing shall be provided from the top of the pile down a minimum of 120 percent of the flexural length. Where a structure is assigned to Seismic Design D, E or F, the pile shall be considered as an alternative system in accordance with Section 104.11. The alternative pile system design, supporting documentation and test data shall be submitted to the building official for review and approval.

1810.8.5 Installation. The pile shall be permitted to be formed in a hole advanced by rotary or percussive drilling methods, with or without casing. The pile shall be grouted with a fluid cement grout. The grout shall be pumped through a tremie pipe extending to the bottom of the pile until grout of suitable quality returns at the top of the pile. The following requirements apply to specific installation methods:

1. For piles grouted inside a temporary casing, the reinforcing bars shall be inserted prior to withdrawal of the casing. The casing shall be withdrawn in a controlled manner with the grout level maintained at the top of the pile to ensure that the grout completely fills the drill hole. During withdrawal of the casing, the grout level inside the casing shall be monitored to check that the flow of grout inside the casing is not obstructed.
2. For a pile or portion of a pile grouted in an open drill hole in soil without temporary casing, the minimum design diameter of the drill hole shall be verified by a suitable device during grouting.
3. For piles designed for end bearing, a suitable means shall be employed to verify that the bearing surface is properly cleaned prior to grouting.
4. Subsequent piles shall not be drilled near piles that have been grouted until the grout has had sufficient time to harden.
5. Piles shall be grouted as soon as possible after drilling is completed.
6. For piles designed with a full length casing, the casing shall be pulled back to the top of the bond zone and reinserted or some by other suitable means employed to assure grout coverage outside the casing.

Committee Reason: The proposal makes editorial improvements so that the provisions for micropiles are clearer. The modification further clarifies the minimum material requirements for steel pipe.

Assembly Action:

None

Final Hearing Results

S54-06/07

AM

Code Change No: **S56-06/07**

Original Proposal

Section: 1908.1.16

Proponent: John F. Silva, SE, Hilti, Inc.

Revise as follows:

1908.1.16 ACI 318, Section D.3.3. Modify ACI 318, Sections D.3.3.2 through D.3.3.5 to read as follows:

D.3.3.2 – *In structures assigned to Seismic Design Category C, D, E or F, post-installed anchors for use under D.2.3 shall have passed the Simulated Seismic Tests of ACI 355.2.*

D.3.3.3 – *In structures assigned to Seismic Design Category C, D, E or F, the design strength of anchors shall be taken as $0.75 N_n$ and $0.75 V_n$, where ϕ is given in D.4.4 or D.4.5, and N_n and V_n are determined in accordance with D.4.1.*

D.3.3.4 – *In structures assigned to Seismic Design Category C, D, E or F, anchors shall be designed to be governed by tensile or shear strength of a ductile steel element, unless D.3.3.5 is satisfied.*

Exception: *Anchors in concrete designed to support non-structural components in accordance with ASCE 7 Section 13.4.2 need not satisfy Section D.3.3.4.*

D.3.3.5 – *Instead of D.3.3.4, the attachment that the anchor is connecting to the structure shall be designed so that the attachment will undergo ductile yielding at a load level corresponding to anchor forces not greater than the design strength of anchor specified in D.3.3.3, or the minimum design strength of the anchor shall be at least 2.5 times the factored forces transmitted by the attachment.*

Exception: *Anchors in concrete designed to support non-structural components in accordance with ASCE 7 Section 13.4.2 need not satisfy Section D.3.3.5.*

Reason: The purpose of the proposed code change is to correct an error that arises from the multiple provisions that address the design of non-ductile anchors.

This code change proposal corrects an inadvertent problem in coordination between the NEHRP Provisions and the ACI code in anchorage force requirements for the seismic design of nonstructural components. Currently, both ASCE 7 Section 13.4.2, which regulates the design of non-structural components for earthquake loading, and Section 1908.1.16, which addresses the design of anchors in concrete, impose additional load factors on anchors in SDC C and above. Increases for non-ductile anchorage forces are provided in ASCE 7-05 Section 13.4.2 and the changes to ACI 318-05 provided in IBC Section 1908.1.16 provide similar increases. It was never intended that non-ductile anchor force increase factors for nonstructural components be applied twice.

Cost Impact: This change is expected to reduce the cost of anchorage of nonstructural components attached to concrete.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: This code change adds exceptions to correct a duplication in the penalty on non-ductile anchors supporting non-structural components.

Assembly Action:

None

Final Hearing Results

S56-06/07

AS

Code Change No: **S57-06/07**

Original Proposal

Sections: 2101.3.1, 2305.1.3

Proponent: Edwin T. Huston, Smith & Huston Inc., representing National Council of Structural Engineering Associations

Revise as follows:

2101.3.1 Fireplace drawings. The construction documents shall describe in sufficient detail the location, size and construction of masonry fireplaces. The thickness and characteristics of materials and the clearances from walls, partitions and ceilings shall be ~~clearly~~ indicated.

2305.1.3 Openings in shear panels. Openings in shear panels that materially affect their strength shall be ~~fully~~ detailed on the plans, and shall have their edges adequately reinforced to transfer all shearing stresses.

Reason: Substitute revised material for current provision of the code. This proposal is a continuation of code change proposal S3-04/05 (AM), which proposed revisions similar to those in this proposal. The purpose of the proposal is to clarify the provisions of IBC Sections 2101.3.1 and 2305.1.3 for documentation on construction documents. The term "clearly" is deleted from Section 2101.3.1 because it is superfluous to require clearances to be clearly indicated on construction documents. Requiring clearances to be indicated on construction documents is sufficiently clear. The term "fully" is deleted from Section 2205.1.3 because it is not possible to fully detail openings on plans. What is needed is a sufficient number of details so that the building or structure can be constructed as intended by the design team, which is conveyed by requiring that the openings be detailed.

Cost Impact: The code change proposal will not increase the cost of construction

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: This proposal makes editorial changes to provisions that require information to be included in construction documents. The revised wording is more concise.

Assembly Action:

None

Final Hearing Results

S57-06/07

AS

Code Change No: **S64-06/07**

Original Proposal

Section: 2302.1

Proponent: Sam Francis, American Forest & Paper Association

Revise as follows:

SECTION 2302 DEFINITIONS

NATURALLY DURABLE WOOD. The heartwood of the following species with the exception that an occasional piece with corner sapwood is permitted if 90 percent or more of the width of each side on which it occurs is heartwood.

Decay resistant. Redwood, cedar, black locust and black walnut.

Termite resistant. Redwood, Alaska yellow cedar, Eastern red cedar and both heartwood and all sapwood of western red cedar.

Reason: This proposal is intended to clarify the code requirements for special inspections. Many common items are fabricated under standards cited in the IBC. Many of those items are fabricated with strict quality assurance done under third party supervision. In addition, the proposal also eliminates laundry lists from the code text. Such lists make interpretation and maintenance of the code awkward at best but potentially very, very difficult.

This change introduces species recently found to be termite resistant. Special emphasis of the study was Formosan termite resistance which is of great importance to gulf coast states trying to rebuild following recent hurricanes. These states are particularly susceptible to the Formosan termite.

Cost Impact: In areas suffering widespread damage, construction materials can become scarce and, thus, costly. More choices typically lead to less cost pressure.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: This code change identifies termite resistant properties in order to clarify the definition of naturally durable wood.

Assembly Action:

None

Final Hearing Results

S64-06/07

AS

Code Change No: S65-06/07

Original Proposal

Section: 2302.1

Proponent: Joseph Holland, Hoover Treated Wood Products

Revise as follows:

**SECTION 2302
DEFINITIONS**

~~**PRESERVATIVE-TREATED WOOD.** Wood (including plywood) pressure-treated with preservatives in accordance with Section 2303.1.8.~~

~~**TREATED WOOD.** Wood impregnated under pressure with compounds that reduce its susceptibility to flame spread or to deterioration caused by fungi, insects or marine borers. Wood and wood based materials that use vacuum-pressure impregnation processes to enhance fire retardant or preservative properties.~~

Fire-retardant-treated wood. Pressure-treated lumber and plywood that exhibit reduced surface burning characteristics and resist (prevent) propagation of fire.

Preservative-treated wood. Pressure-treated wood products that exhibit reduced susceptibility to damage by fungi, termites, or marine borers.

Reason: Add additional required information for user in determining what treated wood is. Revise definition of preservative treated wood. Add definition for fire-retardant-treated wood. Make preservative and fire-retardant treated wood a subset of treated wood.

Currently there are two types of treated wood: fire-retardant-treated wood and preservative-treated wood. The current definition only speaks on one of the attributes for the fire-retardant-treated wood. The ability of the wood to extinguish itself once the source of ignition is consumed or removed is an important element of the material. The definition of preservative treated wood is not a definition; it's merely a reference to another section of the code. In addition, preservative treated wood will not reduce susceptibility to all insects, only those that actually eat the wood.

Section 2303.2 requires testing in accordance with ASTM E84. The section requires the test to be continued 20 minutes beyond the 10 minutes required to establish the flame spread. According to Section 2303.2, there can be no significant progressive combustion.

Cost Impact: The code change proposal will not increase the cost of construction. Material in marketplace already meets the requirements of Section 2303.2 IBC.

Public Hearing Results

Committee Action:
Modify proposal as follows:

Approved as Modified

**SECTION 2302
DEFINITIONS**

TREATED WOOD. Wood and wood based materials that use vacuum-pressure impregnation processes to enhance fire retardant or preservative properties.

Fire-retardant-treated wood. Pressure-treated lumber and plywood that exhibit reduced surface burning characteristics and resist ~~(prevent)~~ propagation of fire.

Preservative-treated wood. Pressure-treated wood products that exhibit reduced susceptibility to damage by fungi, ~~termites~~ insects, or marine borers.

Committee Reason: The proposal provides appropriate editorial clarifications in the definitions relating to treated wood. The modification retains insects rather than referring exclusively to termites under preservative-treated wood.

Assembly Action:

None

Final Hearing Results

S65-06/07

AM

Code Change No: **S66-06/07**

Original Proposal

Section: 2303.4

Proponent: Kirk Grundahl, P.E., Wood Truss Council of America representing the Structural Building Components Industry

Revise as follows:

2303.4 Trusses.

2303.4.1 Design. Wood trusses shall be designed in accordance with the provisions of this code and accepted engineering practice. Members are permitted to be joined by nails, glue, bolts, timber connectors, metal connector plates or other approved framing devices.

~~**2303.4.1.1 Truss designer.** The individual or organization responsible for the design of trusses.~~

~~**2303.4.1.2**~~ **2303.4.1.1 Truss design drawings.** The written, graphic and pictorial depiction of each individual truss shall be provided to the building official ~~and for approval~~ approved prior to installation. Truss design drawings shall also be provided with the shipment of trusses delivered to the job site. Truss design drawings shall include, at a minimum, the information specified below:

1. Slope or depth, span and spacing;
2. Location of all joints;
3. Required bearing widths;
4. Design loads as applicable;
 - ~~54.1.~~ Top chord live load (including snow loads);
 - ~~64.2.~~ Top chord dead load;
 - ~~74.3.~~ Bottom chord live load;
 - ~~84.4.~~ Bottom chord dead load;
 - ~~94.5.~~ Concentrated loads and their points of application as applicable;
 - ~~104.6.~~ Controlling wind and earthquake loads as applicable;
- ~~145.~~ Adjustments to wood member ~~lumber~~ and metal connector plate design value for conditions of use;
- ~~126.~~ Each reaction force and direction;
- ~~137.~~ Metal connector plate type, size, and thickness or gage, and the dimensioned location of each metal connector plate except where symmetrically located relative to the joint interface;
- ~~148.~~ Lumber's Size, species and grade for each wood member;
- ~~159.~~ Connection capacities for:
 - ~~15.19.1.~~ Truss to truss;
 - ~~15.29.2.~~ Truss ply to ply; and
 - ~~15.39.3.~~ Field splices.
- ~~1610.~~ Calculated deflection ratio and maximum vertical and horizontal deflection for live and total load as applicable;
- ~~1711.~~ Maximum axial ~~tensile~~ tension and compression forces in the truss members; and
- ~~1812.~~ Required permanent individual truss member bracing and method per Section 2303.4.1.5, unless a specific truss member permanent bracing plan for the roof or floor structural system is provided by a registered design professional.

Where required by one of the following, ~~each individual truss design drawing shall bear the seal and signature of the truss designer:~~

- ~~1. Registered design professional; or~~
- ~~2. Building official; or~~
- ~~3. Statutes of the jurisdiction in which the project is to be constructed.~~

Exceptions:

- ~~1. When a cover sheet/truss index sheet combined into a single cover sheet is attached to the set of truss design drawings for the project, the single sheet/truss index sheet is the only document that needs to be signed and sealed within the truss submittal package.~~
- ~~2. When a cover sheet and a truss index sheet are separately provided and attached to the set of truss design drawings for the project, both the cover sheet and the truss index sheet are the only documents that need to be signed and sealed within the truss submittal package.~~

~~2303.4.1.3 Truss placement diagram.~~ ~~The truss manufacturer shall provide a truss placement diagram that identifies the proposed location for each individually designated truss and references the corresponding truss design drawing. The truss placement diagram shall be provided as part of the truss submittal package, and with the shipment of trusses delivered to the job site. Truss placement diagrams shall not be required to bear the seal or signature of the truss designer.~~

~~Exception:~~ ~~When the truss placement diagram is prepared under the direct supervision of a registered design professional, it is required to be signed and sealed.~~

~~2303.4.1.4 Truss submittal package.~~ ~~The truss submittal package shall consist of each individual truss design drawing, the truss placement diagram for the project, the truss member permanent bracing specification and, as applicable, the cover sheet/truss index sheet.~~

~~2303.4.1.5~~ 2303.4.1.2 Truss member permanent bracing. Where permanent bracing of truss members is required on the truss design drawings, it shall be accomplished by one of the following methods:

1. The trusses shall be designed so that the buckling of any individual truss member ~~can be~~ is resisted internally by the structure (e.g. buckling member T-bracing, L-bracing, etc.) of the individual truss through suitable means (i.e., buckling reinforcement by T-bracing or L-bracing). The truss individual member buckling reinforcement of individual members of the trusses shall be installed as shown on the truss design drawing or on supplemental truss member buckling reinforcement diagrams details provided by the truss designer.

2. Permanent bracing shall be installed using standard industry lateral bracing details that conform in accordance with generally accepted engineering practice. Individual truss member continuous Locations for lateral bracing location(s) shall be shown identified on the truss design drawing.

2303.4.1.3 Truss designer. The individual or organization responsible for the design of trusses.

2303.4.1.3.1 Truss design drawings. Where required by the registered design professional, the building official, or the statutes of the jurisdiction in which the project is to be constructed, each individual truss design drawing shall bear the seal and signature of the truss designer:

Exceptions:

1. Where a cover sheet and truss index sheet are combined into a single sheet and attached to the set of truss design drawings the single cover/truss index sheet is the only document required to be signed and sealed by the truss designer.
2. When a cover sheet and a truss index sheet are separately provided and attached to the set of truss design drawings the cover sheet and the truss index sheet are the only documents required to be signed and sealed by the truss designer.

2303.4.2 Truss placement diagram. The truss manufacturer shall provide a truss placement diagram that identifies the proposed location for each individually designated truss and references the corresponding truss design drawing. The truss placement diagram shall be provided as part of the truss submittal package, and with the shipment of trusses delivered to the job site. Truss placement diagrams shall not be required to bear the seal or signature of the truss designer.

Exception: When the truss placement diagram is prepared under the direct supervision of a registered design professional, it is required to be signed and sealed.

2303.4.3 Truss submittal package. The truss submittal package shall consist of each individual truss design drawing, the truss placement diagram, the truss member permanent bracing details and, as applicable, the cover/truss index sheet.

~~2303.4.1.6~~ **2303.4.4 Anchorage.** All transfer Transfer of loads and anchorage of each truss to the supporting structure is the responsibility of the registered design professional.

~~2303.4.1.7~~ **2303.4.5 Alterations to trusses.** Truss members and components shall not be cut, notched, drilled, spliced or otherwise altered in any way without written concurrence and approval of a registered design professional. Alterations resulting in the addition of loads to any member (e.g., HVAC equipment, water heater) shall not be permitted without verification that the truss is capable of supporting such additional loading.

~~2303.4.2~~ **2303.4.6 Metal-plate-connected trusses.** In addition to Sections 2303.4.1 through ~~2303.4.1.7~~ 2303.4.5, the design, manufacture and quality assurance of metal-plate-connected wood trusses shall be in accordance with TPI 1. Manufactured trusses shall comply with Section 1704.6 as applicable.

Reason: To make editorial improvements to the language and arrangement approved by code change S165-04/05. The language improvements are to provide more precision in the code. The restructuring of the section provides clearer presentation of the concepts.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Modified

Modify proposal as follows:

2303.4 Trusses.

2303.4.1 Design. Wood trusses shall be designed in accordance with the provisions of this code and accepted engineering practice. Members are permitted to be joined by nails, glue, bolts, timber connectors, metal connector plates or other approved framing devices.

2303.4.1.1 Truss design drawings. The written, graphic and pictorial depiction of each individual truss shall be provided to the building official for approval prior to installation. Truss design drawings shall also be provided with the shipment of trusses delivered to the job site. Truss design drawings shall include, at a minimum, the information specified below:

1. Slope or depth, span and spacing;
2. Location of all joints;
3. Required bearing widths;
4. Design loads as applicable;
 - 4.1. Top chord live load (including snow loads);
 - 4.2. Top chord dead load;
 - 4.3. Bottom chord live load; 4.4. Bottom chord dead load;
 - 4.4. Concentrated loads and their points of application as applicable;
 - 4.6. Controlling wind and earthquake loads as applicable;
5. Adjustments to wood member and metal connector plate design value for conditions of use;
6. Each reaction force and direction;
7. Metal connector plate type, size, and thickness or gage, and the dimensioned location of each metal connector plate except where symmetrically located relative to the joint interface;
8. Size, species and grade for each wood member;
9. Specific connection capacities or G connection capacities required for:
 - 9.1. Truss to truss girder;
 - 9.2. Truss ply to ply; and
 - 9.3. Field splices assembly of a truss when the truss shown on the individual Truss Design Drawing is supplied in separate pieces that will be field connected.
10. Calculated deflection ratio and maximum vertical and horizontal deflection for live and total load as applicable;
11. Maximum axial tension and compression forces in the truss members; and
12. Required permanent individual truss member bracing restraint and method per Section 2303.4.1.2, unless a specific truss member permanent bracing plan for the roof or floor structural system is provided by a registered design professional.

2303.4.1.2 Permanent individual T truss member restraint permanent bracing. Where permanent bracing restraint of truss members is required on the truss design drawings, it shall be accomplished by one of the following methods:

1. The trusses shall be designed so that the buckling of any individual truss member is resisted internally by the individual truss through suitable means (i.e., buckling reinforcement by T-reinforcement bracing or L-reinforcement bracing). The buckling reinforcement of individual members of the trusses shall be installed as shown on the truss design drawing or on supplemental truss member buckling reinforcement details provided by the truss designer.
2. Permanent individual truss member restraint and diagonal bracing shall be installed using standard industry lateral restraint and diagonal bracing details in accordance with generally accepted engineering practice. Locations for lateral bracing restraint shall be identified on the truss design drawing.

2303.4.1.3 Truss designer. The individual or organization responsible for the design of trusses.

2303.4.1.3.1 Truss design drawings. Where required by the registered design professional, the building official, or the statutes of the jurisdiction in which the project is to be constructed, each individual truss design drawing shall bear the seal and signature of the truss designer:

Exceptions:

1. Where a cover sheet and truss index sheet are combined into a single sheet and attached to the set of truss design drawings the single cover/truss index sheet is the only document required to be signed and sealed by the truss designer.
2. When a cover sheet and a truss index sheet are separately provided and attached to the set of truss design drawings the cover sheet and the truss index sheet are the only documents required to be signed and sealed by the truss designer.

2303.4.2 Truss placement diagram. The truss manufacturer shall provide a truss placement diagram that identifies the proposed location for each individually designated truss and references the corresponding truss design drawing. The truss placement diagram shall be provided as part of the truss submittal package, and with the shipment of trusses delivered to the job site. Truss placement diagrams shall not be required to bear the seal or signature of the truss designer.

Exception: When the truss placement diagram is prepared under the direct supervision of a registered design professional, it is required to be signed and sealed.

2303.4.3 Truss submittal package. The truss submittal package shall consist of each individual truss design drawing, the truss placement diagram, the truss member permanent bracing details and, as applicable, the cover/truss index sheet.

2303.4.4 Anchorage. Transfer of loads and anchorage of each truss to the supporting structure is the responsibility of the registered design professional.

2303.4.5 Alterations to trusses. Truss members and components shall not be cut, notched, drilled, spliced or otherwise altered in any way without written concurrence and approval of a registered design professional. Alterations resulting in the addition of loads to any member (e.g., HVAC equipment, water heater) shall not be permitted without verification that the truss is capable of supporting such additional loading.

2303.4.6 Metal-plate-connected trusses. In addition to Sections 2303.4.1 through 2303.4.5, the design, manufacture and quality assurance of metal-plate-connected wood trusses shall be in accordance with TPI 1. Manufactured trusses shall comply with Section 1704.6 as applicable.

Committee Reason: The proposal provides better organization for wood truss design requirements. The truss placement plan should be part of the design drawings and should be reviewed by the engineer of record. The modification to Section 2304.1.1 clarifies the requirements applicable to truss connections. The modification to Section 2303.4.1.2 coordinates the code text with that of the ANSI/TPI 1 standard.

Assembly Action:

None

Final Hearing Results

S66-06/07

AM

Code Change No: S68-06/07

Original Proposal

Section: 2303.4.2

Proponent: Kirk Grundahl, P.E., Wood Truss Council of America, representing the Structural Building Components Industry

Revise as follows:

2303.4.2 Metal-plate-connected trusses. In addition to Sections 2303.4.1 through 2303.4.1.7, the design, manufacture and quality assurance of metal-plate-connected wood trusses shall be in accordance with TPI 1. Manufactured trusses shall comply with Sections 106 and 109 ~~1704.6~~ as applicable.

Reason: The purpose of the proposed revision is to more clearly indicate:

1. That it is acceptable for a building code official to accept the requirements of TPI 1, as they pertain to 3rd party inspection and in-plant quality control, as meeting the requirements for approved inspections.
2. That the requirement for special inspections is job specific and is only imposed if special inspections are required per the construction documents as part of the submittal process to gain a permit.
The provisions in Sections 104.4 Inspections, 106 Construction Documents and 109 Inspections lay out how the construction project process functions in terms of permits, construction documents, and general inspections and is the implementing language for when Chapter 17 applies.
3. Per 109.3, the building official is responsible for building construction inspections.
4. Per 109.3.4, the building official is responsible for providing the frame inspection.
5. Per 104.4 & 109.4, the building official is authorized to accept reports of an approved inspection agency.
6. As part of this frame inspection in 109.3.4, products that are manufactured in accordance with a referenced standard, under a quality assurance program audited by an approved inspection agency in accordance with 109.4 have typically been allowed for use in the construction process.
7. The inspection of truss manufacturing operations is required by ANSI/TPI 1-2002, the standard referenced for trusses, in Section 2303.4.2, ANSI/TPI 1 includes the following requirement:
3.1.3 Truss Manufacturers and inspection agencies shall establish methods that document the application of these quality assurance procedures throughout the manufacturing process. The Truss Manufacturers' methods shall be subject to periodic audit for compliance with the requirements of this standard by an approved inspection agency, where required by local authorities having jurisdiction, or other means.
The use of an approved third party inspection agency for the inspection of truss manufacturing operations meets the general inspection requirements of Section 109.4.

Special Inspections are required only if specifically required for a project as part of the submittal process to gain a permit for the building to be constructed (Sections 106.1 and 1704.1.1). A Special Inspection may be called for by one of three parties: the owner, the registered design professional, or the building official that reviews the application for a permit.

Section 1704.6 specifies that Special Inspections of the fabrication process of prefabricated wood structural elements and assemblies shall be in accordance with 1704.2.

Metal plate-connected wood truss manufacturers meet the requirements of Section 1704.2.2, Fabricator Approval, as referenced in the Exception in Section 1704.2.1:

Exception: Special inspections as required by Section 1704.2 shall not be required where the fabricator is approved in accordance with Section 1704.2.2.

A metal plate-connected wood truss manufacturer may be approved to perform fabrication per the requirements of Section 1704.2.2 as follows:

1. An approved fabricator is one that has written procedural and quality control manuals and periodic auditing of fabrication practices by an approved special inspection agency, both of which are required by ANSI/TPI 1-2002:
3.1.3 Truss Manufacturers and inspection agencies shall establish methods that document the application of these quality assurance procedures throughout the manufacturing process. The Truss Manufacturers' methods shall be subject to periodic audit for compliance with the requirements of this standard by an approved inspection agency, where required by local authorities having jurisdiction, or other means.
3.2.1 An in-plant quality control manual shall be maintained for each truss manufacturing facility, which will include the requirements for daily quality control and any audits that will be performed."
2. An approved special inspection agency is certified by the International Accreditation Service (IAS) under the Accreditation Criteria for Inspection Agencies (AC98) or other approvals as accepted by the building official overseeing code compliance. It is our understanding that all the third party inspection agencies performing inspections in our industry are accredited by IAS.
3. The structural building components that are fabricated for the specific project are demonstrated to be compliant with the construction documents by the information provided on the Truss Design Drawings as required in Section 2303.4.1.2. It is still the responsibility of the building designer to review the Truss Design Drawings for compatibility with the design of the building per Section 106.3.4.

In addition to the reasoning provided above, we do not believe that metal plate connected wood trusses require special inspection. The definition for Special Inspection as provided in 1702.1 indicates that special inspections are required when "special expertise is needed to ensure compliance with approved construction documents and referenced standards." Inspection of the materials used in the manufacturing of metal plate connected wood trusses does require any special qualifications. The truss design drawing as defined in Section 2303.4.1.2 provides all the information that the building inspector or his or her designee needs to inspect the trusses at the job site as part of the framing inspection.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Modified

Modify the proposal as follows:

2303.4.2 Metal-plate-connected trusses. In addition to Sections 2303.4.1 through 2303.4.1.7, the design, manufacture and quality assurance of metal-plate-connected wood trusses shall be in accordance with TPI 1. ~~Manufactured trusses shall comply~~ Jobsite inspections shall be in compliance with Sections 106 and 109.4 as applicable.

Committee Reason: This code change clarifies the inspections of metal-plate-connected trusses. The modification provides a specific reference to the job site inspections that are typically required for these trusses.

Assembly Action:

None

Final Hearing Results

S68-06/07

AM

Code Change No: S69-06/07

Original Proposal

Section: 2304.6.1

Proponent: Zeno Martin, P.E., APA-The Engineered Wood Association

Revise as follows:

2304.6.1 Wood structural panel sheathing. Where wood structural panel sheathing is used as the exposed finish on the exterior of outside walls, it shall have an exterior exposure durability classification. Where wood structural panel sheathing is used elsewhere, ~~on the exterior of outside walls~~ but not as the exposed finish, it shall be of a type manufactured with exterior glue (Exposure 1 or Exterior). ~~Where wood structural panel sheathing is used elsewhere, it shall be of a type manufactured with intermediate or exterior glue.~~

Reason: Delete reference to obsolete adhesive. Intermediate glue is no longer used in the manufacturing of structural panel sheathings trademarked to PS 1 or PS 2. This change improves the code by simplifying the provisions to reflect the product availability in the marketplace.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: This proposal appropriately deletes reference to an obsolete material.

Assembly Action:

None

Final Hearing Results

S69-06/07

AS

Code Change No: **S70-06/07**

Original Proposal

Sections: 2304.6.1, Table 2304.6.1 (New); IRC R602.3, Table R602.3(3), R602.10.3

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL AND THE IRC BUILDING/ENERGY CODE DEVELOPMENT COMMITTEES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

Proponent: Zeno Martin, P.E., APA-The Engineered Wood Association

PART I – IBC

1. Revise as follows:

2304.6.1 Wood structural panel sheathing. Where wood structural panel sheathing is used as the exposed finish on the exterior of outside walls, it shall have an exterior exposure durability classification. Where wood structural panel sheathing is used on the exterior of outside walls but not as the exposed finish, it shall be of a type manufactured with exterior glue (Exposure 1 or Exterior). Where wood structural panel sheathing is used elsewhere, it shall be of a type manufactured with intermediate or exterior glue. Wood structural panel wall sheathing or siding used as structural sheathing shall be capable of resisting wind pressures in accordance with Section 1609. Maximum wind speeds for wood structural panel sheathing used to resist wind pressures shall be in accordance with Table 2304.6.1.

2. Add new table as follows:

**TABLE 2304.6.1
MAXIMUM BASIC WIND SPEED (mph – 3 SECOND GUST) PERMITTED
FOR WOOD STRUCTURAL PANEL WALL SHEATHING USED TO RESIST WIND PRESSURES^{a,b,c}**

MINIMUM NAIL		MINIMUM WOOD STRUCTURAL PANEL SPAN RATING	MINIMUM NOMINAL PANEL THICKNESS (INCHES)	MAXIMUM WALL STUD SPACING (INCHES)	PANEL NAIL SPACING		MAXIMUM WIND SPEED (MPH)		
SIZE	PENETRATION (inches)				EDGES (INCHES O.C.)	FIELD (INCHES O.C.)	WIND EXPOSURE CATEGORY		
							B	C	D
6d Common (0.113" x 2.0")	1.5	24/0	3/8	16	6	12	110	90	85
		24/16	7/16	16	6	12	110	100	90
8d Common (0.131" x 2.5")	1.75	24/16	7/16	16	6	12	130	110	105
				16	6	6	150	125	110
				24	6	12	110	90	85
				24	6	6	110	90	85

- a. Panel strength axis parallel or perpendicular to supports. Three-ply plywood sheathing with studs spaced more than 16 inches on center shall be applied with panel strength axis perpendicular to supports.
- b. Table is based on wind pressures acting toward and away from building surfaces in accordance with Section 6.4.2.2 of ASCE 7. Lateral requirements shall be in accordance with Section 2305 or Section 2308.
- c. Wood Structural Panels with span ratings of Wall-16 or Wall-24 shall be permitted as an alternate to panels with a 24/0 span rating. Plywood Siding rated 16 oc or 24 oc shall be permitted as an alternate to panels with a 24/16 span rating. Wall-16 and Plywood Siding 16 oc shall be used with studs spaced a maximum of 16 inches on center.

PART II – IRC

1. Revise as follows:

R602.3 Design and Construction. Exterior walls of wood-frame construction shall be designed and constructed in accordance with the provisions of this chapter and Figures R602.3(1) and R602.3(2) or in accordance with AF&PA's NDS. Components of exterior walls shall be fastened in accordance with Table R602.3(1) through R602.3(4).

Exterior walls covered with foam plastic sheathing shall be braced in accordance with Section R602.10. Structural sheathing shall be fastened directly to structural framing members. Wall sheathing or siding shall be capable of resisting wind pressures listed in Table R301.2(2). Maximum wind speeds permitted for exterior walls covered with wood structural panel sheathing are listed in Table R602.3(3).

2. Delete Table R602.3(3) and substitute as follows:

TABLE R602.3(3)
MAXIMUM WIND SPEED (mph – 3 SECOND GUST) PERMITTED FOR
WOOD STRUCTURAL PANEL WALL SHEATHING USED TO RESIST WIND PRESSURES^{a, b, c}

Minimum Nail		Minimum Wood Structural Panel Span Rating	Minimum Nominal Panel Thickness (inches)	Maximum Wall Stud Spacing (inches)	Panel Nail Spacing		Maximum Wind Speed (mph)		
Size	Penetration (inches)				Edges (inches o.c.)	Field (inches o.c.)	Wind Exposure Category		
							B	C	D
6d Common (0.113" x 2.0")	1.5	24/0	3/8	16	6	12	110	90	85
				16	6	12	130	110	105
8d Common (0.131" x 2.5")	1.75	24/16	7/16	24	6	12	110	90	85

- a. Panel strength axis parallel or perpendicular to supports. Three-ply plywood sheathing with studs spaced more than 16 inches on center shall be applied with panel strength axis perpendicular to supports.
- b. Table is based on wind pressures acting toward and away from building surfaces in accordance with Section R301.2. Lateral bracing requirements shall be in accordance with R602.10.
- c. Wood Structural Panels with span ratings of Wall-16 or Wall-24 shall be permitted as an alternate to panels with a 24/0 span rating. Plywood Siding rated 16 oc or 24 oc shall be permitted as an alternate to panels with a 24/16 span rating. Wall-16 and Plywood Siding 16 oc shall be used with studs spaced a maximum of 16 inches on center.

R602.10.3 Braced wall panel construction methods. The construction of braced wall panels shall be in accordance with one of the following methods:

1. Nominal 1-inch-by-4-inch (25mm by 102 mm) continuous diagonal braces let in to the top and bottom plates and the intervening studs or approved metal strap devices installed in accordance with the manufacturer's specifications. The let-in bracing shall be placed at an angle not more than 60 degrees (1.06 rad) or less than 45 degrees (0.79 rad) from the horizontal.
2. Wood boards of 5/8 inch (16 mm) net minimum thickness applied diagonally on studs spaced a maximum of 24 inches (610 mm). Diagonal boards shall be attached to studs in accordance with Table R602.3(1).
3. Wood structural panel sheathing with a thickness not less than 5/16 inch (8 mm) for 16-inch (406 mm) stud spacing and not less than 3/8 inch (9 mm) for 24-inch (610 mm) stud spacing. Wood structural panels shall be installed in accordance with Table R602.3(3) (1).
4. One-half-inch (13 mm) or 25/32-inch (20 mm) thick structural fiberboard sheathing applied vertically or horizontally on studs spaced a maximum of 16 inches (406 mm) on center. Structural fiberboard sheathing shall be installed in accordance with Table R602.3(1).
5. Gypsum board with minimum 1/2-inch (13 mm) thickness placed on studs spaced a maximum of 24 inches (610 mm) on center and fastened at 7 inches (178 mm) on center with the size nails specified in Table R602.3(1) for sheathing and Table R702.3.5 for interior gypsum board.
6. Particleboard wall sheathing panels installed in accordance with Table R602.3(4).
7. Portland cement plaster on studs spaced a maximum of 16 inches (406 mm) on center and installed in accordance with Section R703.6.
8. Hardboard panel siding when installed in accordance with Table R703.4.

Exception: Alternate braced wall panels constructed in accordance with Section R602.10.6.1 or R602.10.6.2 shall be permitted to replace any of the above methods of braced wall panels.

Reason: The code change provides guidelines for using wood structural panel wall sheathing to resist wind loads.

Recent high wind events including Hurricane Katrina and several tornado storms have shown that failure of wall sheathing, in winds as low as 60 mph, has caused significant damage due to breaching of the wall envelope. This code change proposal provides wall sheathing solutions using wood structural panels to resist wind pressures. The code change proposal provides a new table 2304.6.1 which clearly shows the capabilities of wood structural panel cladding at varying wind speeds and exposures.

The proposed IBC Table 2304.6.1 was developed by comparing the wind pressures (wind speed) required by Section 1609.3 given in ASCE 7-05 Figure 6-3 (formerly 2003 IBC Table 1609.6.2.1(2)) with the wood structural panel capacities based on US DOC PS 2 standard, engineering calculations, and the Panel Design Specification referenced in 2006 IBC Section 2306.1. The proposed IRC Table R602.3(3) was developed by comparing the wind pressures (wind speed) given in Table R301.2(2) with the wood structural panel capacities based on US DOC PS 2 standard, engineering calculations, and the Panel Design Specification referenced in 2006 IBC Section 2306.1. Nail head pull through and withdrawal was also considered in addition to the panel stiffness and bending strength. The panel-fastener capacity was based on tributary to a single critical nail.

This code change proposal improves the code because it clearly defines the maximum wind speed permitted for wood structural panel wall sheathing.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

PART I — IBC**Committee Action:****Approved as Modified**

Modify proposal as follows:

2304.6.1 Wood structural panel sheathing. Where wood structural panel sheathing is used as the exposed finish on the exterior of outside walls, it shall have an exterior exposure durability classification. Where wood structural panel sheathing is used on the exterior of outside walls but not as the exposed finish, it shall be of a type manufactured with exterior glue (Exposure 1 or Exterior). Where wood structural panel sheathing is used elsewhere, it shall be of a type manufactured with intermediate or exterior glue. Wood structural panel wall sheathing or siding used as structural sheathing shall be capable of resisting wind pressures in accordance with Section 1609. Maximum wind speeds for wood structural panel sheathing used to resist wind pressures shall be in accordance with Table 2304.6.1 for enclosed buildings with a mean roof height not greater than 30 feet (9144 mm) importance factor (I) of 1.0 and topographic factor (Kzt) of 1.0.

**TABLE 2304.6.1
MAXIMUM BASIC WIND SPEED (mph – 3 SECOND GUST) PERMITTED FOR WOOD STRUCTURAL PANEL
WALL SHEATHING USED TO RESIST WIND PRESSURES^{a,b,c}**

MINIMUM NAIL		MINIMUM WOOD STRUCTURAL PANEL SPAN RATING	MINIMUM NOMINAL PANEL THICKNESS (INCHES)	MAXIMUM WALL STUD SPACING (INCHES)	PANEL NAIL SPACING		MAXIMUM WIND SPEED (MPH)		
SIZE	PENETRATION (INCHES)				EDGES (INCHES O.C.)	FIELD (INCHES O.C.)	WIND EXPOSURE CATEGORY		
							B	C	D
6d Common (0.113" x 2.0")	1.5	24/0	3/8	16	6	12	110	90	85
		24/16	7/16	16	6	12	110	100	90
8d Common (0.131" x 2.5")	1.75	24/16	7/16	16	6	12	130	110	105
						6	150	125	110
				24	6	12	110	90	85
						6	110	90	85

- Panel strength axis parallel or perpendicular to supports. Three-ply plywood sheathing with studs spaced more than 16 inches on center shall be applied with panel strength axis perpendicular to supports.
- Table is based on wind pressures acting toward and away from building surfaces in accordance with Section 6.4.2.2 of ASCE 7. Lateral requirements shall be in accordance with Section 2305 or Section 2308.
- Wood Structural Panels with span ratings of Wall-16 or Wall-24 shall be permitted as an alternate to panels with a 24/0 span rating. Plywood Siding rated 16 oc or 24 oc shall be permitted as an alternate to panels with a 24/16 span rating. Wall-16 and Plywood Siding 16 oc shall be used with studs spaced a maximum of 16 inches on center.

Committee Reason: This code change adds requirements for wood structural panel wall sheathing that addresses concerns associated with high wind speeds. The modification places limitations on the tabulated values that are consistent with the assumptions used to calculate them.

Assembly Action:

None**PART II – IRC****Committee Action:****Disapproved**

Committee Reason: This code change is confusing as to when it is referencing sheathing or siding. Siding is wall covering and is not appropriate to be referenced in this section. This has the appearance of proprietary.

Assembly Action:

None

Final Hearing Results

**S70-06/07, Part I
S70-06/07, Part II**

**AM
D**

Code Change No: **S72-06/07**

Original Proposal

Table 2304.7(3), Table 2306.3.1, Table 2306.4.1, 2308.9.3, Table 2308.9.3(3); IRC Tables R503.2.1.1(1) - R602.3(1)- R602.3(3), R602.10.3

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL AND THE IRC BUILDING/ENERGY CODE DEVELOPMENT COMMITTEES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IBC

Proponent: Edward L. Keith, P.E., APA-The Engineered Wood Association

Revise tables as follows:

TABLE 2304.7(3)
ALLOWABLE SPANS AND LOADS FOR WOOD STRUCTURAL PANEL SHEATHING AND SINGLE-FLOOR GRADES CONTINUOUS OVER TWO OR MORE SPANS WITH STRENGTH AXIS PERPENDICULAR TO SUPPORTS ^{a,b}

SHEATHING GRADES		ROOF ^c				FLOOR ^d
Panel span rating roof/floor span	Panel thickness (inches)	Maximum span (inches)		Load ^e (psf)		Maximum span (inches)
		With edge support ^f	Without edge support	Total load	Live load	
12/0	5/16	12	12	40	30	0
16/0	5/16-3/8	16	16	40	30	0
20/0	5/16 3/8	20	20	40	30	0

(Portions of table not shown do not change)

TABLE 2306.3.1
ALLOWABLE SHEAR (POUNDS PER FOOT) FOR WOOD STRUCTURAL PANEL DIAPHRAGMS WITH FRAMING OF DOUGLAS FIR-LARCH, OR SOUTHERN PINE^a FOR WIND OR SEISMIC LOADING ^h

PANEL GRADE	COMMON NAIL SIZE ^f OR STAPLE LENGTH AND GAGE	MINIMUM FASTENER PENETRATION IN FRAMING (inches)	MINIMUM NOMINAL PANEL THICKNESS (inch)	MINIMUM NOMINAL WIDTH OF FRAMING MEMBERS AT ADJOINING PANEL EDGES AND BOUNDARIES ^g (inches)	BLOCKED DIAPHRAGMS				UNBLOCKED DIAPHRAGM	
					Fastener spacing (inches) at diaphragm boundaries (all cases) at continuous panel edges parallel to load (Cases 3, 4), and at all panel edge (Cases 5, 6) ^b				Fasteners spaced 6" max. at supported edges ^b	
					6	4	2 1/2 ^c	2 ^c	Case 1 (No unblocked edges or continuous panel joints parallel to load)	All other configurations (Cases 2, 3, 4, 5 and 6)
					Fastener spacing (inches) at other panel edges (Cases 1, 2, 3 and 4) ^b					
					6	6	4	3		
Structural I grades	6d ^e (2" x 0.113")	1 - 3/4	5/16	2	185	250	375	420	165	125
				3	210	280	420	475	185	140
	1 - 1/2 16 Gage	4		2	155	205	310	350	135	105
				3	175	230	345	390	155	115
Sheathing, single floor and other grades covered in DOC PS1 and PS2	6d ^e (2" x 0.113")	1 - 3/4	5/16	2	170	225	335	380	150	110
				3	190	250	280	430	170	125
	1 - 1/2 16 Gage	4		2	140	185	275	315	125	90
				3	155	205	310	350	140	105

(Portions of table not shown do not change)

TABLE 2306.4.1
ALLOWABLE SHEAR (POUNDS PER FOOT) FOR WOOD STRUCTURAL PANEL
SHEAR WALLS WITH FRAMING OF DOUGLAS FIR-LARCH OR SOUTHERN
PINE^a FOR WIND OR SEISMIC LOADING^{b, h, i, j, l}

PANEL GRADE	MINIMUM NOMINAL PANEL THICKNESS (inch)	MINIMUM FASTENER PENETRATION IN FRAMING (inches)	PANELS APPLIED DIRECT TO FRAMING				PANELS APPLIED OVER 1/2" OR 5/8" GYPSUM SHEATHING					
			NAIL (common or galvanized box) or staple size ^k	Fastener spacing at panel edges (inches)				NAIL (common or galvanized box) or staple size ^k	Fastener spacing at panel edges (inches)			
				6	4	3	2 ^e		6	4	3	2 ^e
Structural I Sheathing	5/16	1 1/4	6d (2" x 0.113" common, 2" x 0.099" galvanized box)	200	300	390	540	8d (2 1/2" x 0.131" common, 2 1/2" x 0.113" galvanized box)	200	300	390	540
		1	1 1/2 16 gage	165	245	325	445	2 16 gage	125	185	245	315
Sheathing, plywood siding, ^g except Group 5 Species	5/16 ^c or 1/4 ^c	1 1/4	6d (2" x 0.113" common, 2" x 0.099" galvanized box)	180	270	350	450	8d (2 1/2" x 0.131" common, 2 1/2" x 0.113" galvanized box)	181	270	350	450
		1	1 1/2 16 gage	145	220	295	375	2 16 gage	110	165	220	285
	5/16 ^c	1 1/4	Nail size (galvanized casing)					Nail size (galvanized casing)				
	3/8 ^c	1 3/8	6d (2" x 0.99")	140	210	275	360	8d (2 1/2" x 0.113")	140	210	275	360
			8d (2 1/2" x 0.113")	160	240	310	410	10d (3" x 0.128")	160	240	310 ^f	410 ^f

(Portions of table not shown do not change)

a. and b. (No change to current text)

c. 3/8-inch panel thickness or siding with a span rating of 16 inches on center is the minimum recommended where applied direct to framing as exterior siding. For grooved panel siding, the nominal panel thickness is the thickness of the panel measured at the point of nailing.

d. through i. (No change to current text)

2308.9.3 Bracing. Braced wall lines shall consist of braced wall panels that meet the requirements for location, type and amount of bracing as shown in Figure 2308.9.3, specified in Table 2308.9.3(1) and are in line or offset from each other by not more than 4 feet (1219 mm). Braced wall panels shall start not more than 12 1/2-feet (3810 mm) from each end of a braced wall line. Braced wall panels shall be clearly indicated on the plans. Construction of braced wall panels shall be by one of the following methods:

1. Nominal 1-inch by 4-inch (25 mm by 102 mm) continuous diagonal braces let into top and bottom plates and intervening studs, placed at an angle not more than 60 degrees (1.0 rad) or less than 45 degrees (0.79 rad) from the horizontal and attached to the framing in conformance with Table 2304.9.1.
2. Wood boards of 5/8 inch (15.9 mm) net minimum thickness applied diagonally on studs spaced not over 24 inches (610 mm) o.c.
3. Wood structural panel sheathing with a thickness not less than 5/16-3/8 inch (7.9 mm-9.5 mm) for 16-inch (406 mm) stud spacing and not less than 3/8 inch (9.5 mm) for 24-inch (610 mm) stud spacing in accordance with Tables 2308.9.3(2) and 2308.9.3(3).

(Remainder of section unchanged)

**TABLE 2308.9.3(3)
WOOD STRUCTURAL PANEL WALL SHEATHING^b**

(Not Exposed to the Weather, strength axis Parallel or Perpendicular to Studs Except as Indicated Below)

MINIMUM THICKNESS (inch)	PANEL SPAN RATING	STUD SPACING (inches)		
		Siding nailed to studs	Nailable sheathing	
			Sheathing parallel to studs	Sheathing perpendicular to studs
5/16	12/0, 16/0, 20/0 Wall 16" o.c.	16	-	16
3/8, 15/32, 1/2	16/0, 20/0, 24/0, 32/16, Wall – 24" o.c.	24	16	24
7/16, 15/32, 1/2	24/0, 24/16, 32/16, Wall – 24" o.c.	24	24 ^a	24

(No change to footnotes)

PART II – IRC

Revise tables as follows:

**TABLE R503.2.1.1(1)
ALLOWABLE SPANS AND LOADS FOR WOOD STRUCTURAL PANELS
FOR ROOF AND SUBFLOOR SHEATHING AND COMBINATION SUBFLOOR AND UNDERLAYMENT^{a,b,c}**

SPAN RATING	MINIMUM NOMINAL PANEL THICKNESS (inch)	ALLOWABLE LIVE LOAD (psf) ^{h,i}		MAXIMUM SPAN (inches)		LOAD (pounds per square foot, at maximum span)		MAXIMUM SPAN (inches)
		SPAN @ 16" o.c.	SPAN @ 24" o.c.	With edge support ^d	Without edge support	Total load	Live load	
Sheathing ^e		Roof ^f						Subfloor ^j
12/0	5/16	--	--	12	12	40	30	0
16/0	5/16 3/8	30	--	16	16	40	30	0
20/0	5/16 3/8	50	--	20	20	40	30	0

(Remainder of table unchanged)

**TABLE R602.3(1)
FASTENER SCHEDULE FOR STRUCTURAL MEMBERS**

DESCRIPTION OF BUILDING MATERIALS	DESCRIPTION OF FASTENER ^{b,c,e}	SPACING OF FASTENERS	
		Edges (inches) ⁱ	Intermediate Supports ^{c,e} (inches)
Wood structural panels, subfloor, roof and wall sheathing to framing, and particleboard wall sheathing to framing			
5/16" 3/8" – 1/2"	6d common (2" x 0.113") nail (subfloor, wall) 8d common (2 1/2" x 0.131") nail (roof) ^f	6	12 ^g

(Remainder of table unchanged)

**TABLE R602.3(3)
WOOD STRUCTURAL PANEL WALL SHEATHING**

PANEL SPAN RATING	PANEL NOMINAL THICKNESS (inch)	MAXIMUM STUD SPACING (inches)	
		Siding nailed to: ^a	
		Stud	Sheathing
12/0, 16/0, 20/0, or wall – 16 o.c.	5/16 3/8	16	16 ^b
24/0, 24/16, 32/16 or wall - 24 o.c.	3/8, 7/16, 15/32, 1/2	24	24 ^c

(Notes unchanged)

R602.10.3 Braced wall panel construction methods. The construction of braced wall panels shall be in accordance with one of the following methods:

1. Nominal 1-inch-by-4-inch (25mmby 102 mm) continuous diagonal braces let in to the top and bottom plates and the intervening studs or approved metal strap devices installed in accordance with the manufacturer's specifications. The let-in bracing shall be placed at an angle not more than 60 degrees (1.06 rad) or less than 45 degrees (0.79 rad) from the horizontal.

2. Wood boards of 5/8 inch (16 mm) net minimum thickness applied diagonally on studs spaced a maximum of 24 inches (610 mm). Diagonal boards shall be attached to studs in accordance with Table R602.3(1).
3. Wood structural panel sheathing with a thickness not less than ~~5/16~~ 3/8 inch (89.5 mm) for 16-inch (406 mm) stud spacing and not less than ~~3/8~~ 9 mm for or 24-inch (610 mm) stud spacing. Wood structural panels shall be installed in accordance with Table R602.3(3).
4. One-half-inch (13 mm) or 25/32-inch (20 mm) thick structural fiberboard sheathing applied vertically or horizontally on studs spaced a maximum of 16 inches (406 mm) on center. Structural fiberboard sheathing shall be installed in accordance with Table R602.3(1).
5. Gypsum board with minimum 1/2-inch (13 mm) thickness placed on studs spaced a maximum of 24 inches (610 mm) on center and fastened at 7 inches (178 mm) on center with the size nails specified in Table R602.3(1) for sheathing and Table R702.3.5 for interior gypsum board.
6. Particleboard wall sheathing panels installed in accordance with Table R602.3(4).
7. Portland cement plaster on studs spaced a maximum of 16 inches (406 mm) on center and installed in accordance with Section R703.6.
8. Hardboard panel siding when installed in accordance with Table R703.4.

Exception: Alternate braced wall panels constructed in accordance with Section R602.10.6.1 or R602.10.6.2 shall be permitted to replace any of the above methods of braced wall panels.

Reason: Delete from code products no longer produced.

The 5/16" wood structural panels are currently a very small fraction of the panels produced today. While they have been the minimum panel thickness specified for many applications over the years, the building industry has shifted away from them due to manufacturing efficiencies and marketplace demand. The de facto minimum has become 3/8".

Note that the thickness of the panel at the point of nailing is what determines its shear capacity. A statement reflecting this was added to Footnote c in Table 2306.4.1. As such, panels as thick as 19/32" can have 3/8" to 5/16" remaining at the base of a groove. This is why the 5/16" minimum nominal was maintained for panels attached with siding nails. The annotation for Footnote c and f were added to Table 2306.4.1 as an editorial change.

Cost Impact: The code change proposal will not increase the cost of construction, as the current minimums are effectively no longer produced for structural purposes.

Public Hearing Results

PART I — IBC

Committee Action:

Approved as Submitted

Committee Reason: This code change appropriately removes obsolete wood structural panel sizes from Chapter 23.

Assembly Action:

None

PART II — IRC

Committee Action:

Approved as Submitted

Committee Reason: This change deletes the 5/16" thick wood structural panel that is no longer widely available. The 3/8" thick wood structural panel is the proper thickness to be used for the bracing requirements.

Assembly Action:

None

Final Hearing Results

S72-06/07, Part I
S72-06/07, Part II

AS
AS

Code Change No: **S73-06/07**

Original Proposal

Section: 2304.8

Proponent: Edwin T. Huston, Smith & Huston Inc., representing National Council of Structural Engineering Associations

Revise as follows:**2304.8 Lumber decking.**

2304.8.1 General. Lumber decking shall be designed and installed in accordance with the general provisions of this code and ~~the provisions of this Section 2304.8.~~ Each piece shall be square end-trimmed. When random lengths are furnished, each piece shall be square end trimmed across the face so that at least 90 percent of the pieces ~~will be~~ are within 0.5 degrees (0.00873 rad) of square. The ends of the pieces shall be permitted to be beveled up to 2 degrees (0.0349 rad) from ~~the~~ vertical with the exposed face of the piece slightly longer than the ~~back~~ opposite face of the piece. Tongue-and-groove decking shall be installed with the tongues up on sloped or pitched roofs with pattern faces down.

2304.8.2 Layup patterns. Lumber decking is permitted to be laid up following one of five standard patterns as defined in Sections 2304.8.2.1 through 2304.8.2.5. Other patterns are permitted to be used ~~if justified by~~ provided they are substantiated through engineering analysis.

2304.8.2.1 Simple span pattern. All pieces shall be supported on their ends (i.e., by two supports).

2304.8.2.2 Two-span continuous pattern. All pieces shall be supported by three supports, and all end joints shall occur in line on ~~every other~~ alternating supports. Supporting members shall be designed to accommodate the load redistribution caused by this pattern.

2304.8.2.3 Combination simple and two-span continuous pattern. Courses in end spans shall be alternating simple span pattern and two-span continuous pattern. End joints ~~are~~ shall be staggered in adjacent courses and ~~occur only over~~ shall bear on supports.

2304.8.2.4 Cantilevered pieces intermixed pattern. The decking shall ~~cover~~ extend across a minimum of three spans. Pieces in the each starter course and every third course shall be simple span pattern. Pieces in other courses shall be cantilevered over the supports with end joints at ~~alternate~~ alternating quarter or third points of the spans. ~~and~~ Each piece shall bear on at least one support.

2304.8.2.5 Controlled random pattern. The decking shall ~~cover~~ extend across a minimum of three spans. End joints of pieces within six inches (152 mm) of ~~being in line~~ the end joints of the adjacent pieces in either direction shall be separated by at least two intervening courses. In the end bays, each piece shall bear on at least one support. Where an end joint occurs in an end bay, the next piece in the same course shall continue over the first inner support for at least 24 inches (610 mm). The details of the controlled random pattern shall be as ~~described~~ specified for each decking material in Sections 2304.8.3.3, 2308.4.3 or 2304.8.5.3.

For cantilevered spans with the controlled random pattern, special considerations shall be made when the overhang exceeds Decking that cantilevers beyond a support for a horizontal distance greater than 18 inches (457 mm), 24 inches (610 mm) or 36 inches (914 mm) for two-inch (51 mm), three-inch (76 mm), and four-inch (102 mm) nominal thickness decking, respectively, shall comply with the following:

1. The maximum cantilevered length ~~for the controlled random pattern~~ shall be 30 percent of the length of the first adjacent interior span.
2. For cantilever overhangs within these limits, A structural fascia shall be fastened to each decking piece to maintain a continuous, straight ~~roof~~ line.
3. There shall be no end joints in the ~~cantilevered portion or within one-half~~ decking between the cantilevered end of the decking and the centerline of the first adjacent interior span.

2304.8.3 Mechanically laminated decking.

2304.8.3.1 General. Mechanically laminated decking consists of square edged dimension lumber laminations set on edge and nailed to the adjacent pieces and to the supports.

2304.8.3.2 Nailing. The length of nails connecting laminations shall not be less than two and one-half times the net thickness of each lamination. Where decking supports are 48 inches (1219 mm) on center (o.c.) or less, side nails shall be spaced installed not more than 30 inches (762 mm) o.c. alternately near alternating between top and bottom edges, and staggered one third of the spacing in adjacent laminations. Where supports are spaced more than 48 inches (1219 mm) o.c., side nails shall be spaced installed not more than 18 inches (457 mm) o.c. alternately near alternating between top and bottom edges and staggered one-third of the spacing in adjacent laminations. Two side nails shall be used installed at each end of butt-jointed pieces.

Laminations shall be toenailed to supports with 20d or larger common nails. Where the supports are 48 inches (1219 mm) o.c. or less, alternate laminations shall be toenailed to alternate supports; where supports are spaced more than 48 inches (1219 mm) o.c., alternate laminations shall be toenailed to every support.

2304.8.3.3 Controlled random pattern. There shall be a minimum distance of 24 inches (610 mm) between end joints in adjacent courses. The pieces in the first and second courses shall bear on at least two supports with end joints in these two courses occurring on alternate supports. A maximum of seven intervening courses shall be permitted before this pattern is repeated.

2304.8.4 Two-inch sawn tongue-and-groove decking.

2304.8.4.1 General. Two-inch (51 mm) decking shall have a maximum moisture content of 15 percent. Decking shall be machined with a single tongue-and-groove pattern. Each decking piece shall be nailed to each support as required.

2304.8.4.2 Nailing. Each piece of decking shall be toenailed at each support with one 16d common nail through the tongue and face-nailed with one 16d common nail.

2304.8.4.3 Controlled random pattern. There shall be a minimum distance of 24 inches (610 mm) between end joints in adjacent courses. The pieces in the first and second courses shall bear on at least two supports with end joints in these two courses occurring on alternate supports. A maximum of seven intervening courses shall be permitted before this pattern is repeated.

2304.8.5 Three- and four-inch sawn tongue-and-groove decking.

2304.8.5.1 General. Three-inch (76 mm) and four-inch (102 mm) decking shall have a maximum moisture content of 19 percent. Decking shall be machined with a double tongue-and-groove pattern. Decking pieces shall be interconnected and fastened nailed to the supports as required.

2304.8.5.2 Nailing. Each piece shall be toenailed at each support with one 40d common nail and face-nailed with one 60d common nail. Courses shall be spiked to each other with 8 inch (203 mm) spikes at maximum intervals not to exceed of 30 inches (762 mm) through predrilled edge holes penetrating to a depth of approximately 4 inches (102 mm), and with one spike shall be installed at a distance not exceeding 10 inches (254 mm) from the end of each piece.

2304.8.5.3 Controlled random pattern. There shall be a minimum distance of 48 inches (1219 mm) between end joints in adjacent courses. Pieces not bearing over on a support are permitted to occur be located in interior bays provided the adjacent pieces in the same course continue over the support for at least 24 inches (610 mm). This condition shall not occur more than once in every six courses in each interior bay.

Reason: Substitute revised material for current provision of the code.

The purpose of this proposal is to make editorial improvements to the language, which was approved by code change proposal S170-04/05(AMPC1).

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Modified

Modify the proposal as follows:

2304.8 Lumber decking.

2304.8.1 General. Lumber decking shall be designed and installed in accordance with the general provisions of this code and Section 2304.8. Each piece shall be square end-trimmed. When random lengths are furnished, each piece shall be square end trimmed across the face so that at least 90 percent of the pieces are within 0.5 degrees (0.00873 rad) of square. The ends of the pieces shall be permitted to be beveled up to 2 degrees (0.0349 rad) from the vertical with the exposed face of the piece slightly longer than the opposite face of the piece. Tongue-and-groove decking shall be installed with the tongues up on sloped or pitched roofs with pattern faces down.

2304.8.2 Layup patterns. Lumber decking is permitted to be laid up following one of five standard patterns as defined in Sections 2304.8.2.1 through 2304.8.2.5. Other patterns are permitted to be used provided they are substantiated through engineering analysis.

2304.8.2.1 Simple span pattern. All pieces shall be supported on their ends (i.e., by two supports).

2304.8.2.2 Two-span continuous pattern. All pieces shall be supported by three supports, and all end joints shall occur in line on alternating supports. Supporting members shall be designed to accommodate the load redistribution caused by this pattern.

2304.8.2.3 Combination simple and two-span continuous pattern. Courses in end spans shall be alternating simple span pattern and two-span continuous pattern. End joints shall be staggered in adjacent courses and shall bear on supports.

2304.8.2.4 Cantilevered pieces intermixed pattern. The decking shall extend across a minimum of three spans. Pieces in each starter course and every third course shall be simple span pattern. Pieces in other courses shall be cantilevered over the supports with end joints at alternating quarter or third points of the spans. Each piece shall bear on at least one support.

2304.8.2.5 Controlled random pattern. The decking shall extend across a minimum of three spans. End joints of pieces within six inches (152 mm) of the end joints of the adjacent pieces in either direction shall be separated by at least two intervening courses. In the end bays, each piece shall bear on at least one support. Where an end joint occurs in an end bay, the next piece in the same course shall continue over the first inner support for at least 24 inches (610 mm). The details of the controlled random pattern shall be as specified for each decking material in Section 2304.8.3.3, 2308.4.3 or 2304.8.5.3.

Decking that cantilevers beyond a support for a horizontal distance greater than 18 inches (457 mm), 24 inches (610 mm) or 36 inches (914 mm) for two-inch (51 mm), three-inch (76 mm), and four-inch (102 mm) nominal thickness decking, respectively, shall comply with the following:

1. The maximum cantilevered length shall be 30 percent of the length of the first adjacent interior span.
2. ~~For cantilever overhangs within these limits,~~ A structural fascia shall be fastened to each decking piece to maintain a continuous, straight line.
3. There shall be no end joints in the decking between the cantilevered end of the decking and the centerline of the first adjacent interior span.

2304.8.3 Mechanically laminated decking.

2304.8.3.1 General. Mechanically laminated decking consists of square edged dimension lumber laminations set on edge and nailed to adjacent pieces and to the supports.

2304.8.3.2 Nailing. The length of nails connecting laminations shall not be less than two and one-half times the net thickness of each lamination. Where decking supports are 48 inches (1219 mm) on center (o.c.) or less, side nails shall be installed not more than 30 inches (762 mm) o.c. alternating between top and bottom edges, and staggered one third of the spacing in adjacent laminations. Where supports are spaced more than 48 inches (1219 mm) o.c., side nails shall be installed not more than 18 inches (457 mm) o.c. alternating between top and bottom edges and staggered one-third of the spacing in adjacent laminations. Two side nails shall be installed at each end of butt-jointed pieces.

Laminations shall be toenailed to supports with 20d or larger common nails. Where the supports are 48 inches (1219 mm) o.c. or less, alternate laminations shall be toenailed to alternate supports; where supports are spaced more than 48 inches (1219 mm) o.c., alternate laminations shall be toenailed to every support.

2304.8.3.3 Controlled random pattern. There shall be a minimum distance of 24 inches (610 mm) between end joints in adjacent courses. The pieces in the first and second courses shall bear on at least two supports with end joints in these two courses occurring on alternate supports. A maximum of seven intervening courses shall be permitted before this pattern is repeated.

2304.8.4 Two-inch sawn tongue-and-groove decking.

2304.8.4.1 General. Two-inch (51 mm) decking shall have a maximum moisture content of 15 percent. Decking shall be machined with a single tongue-and-groove pattern. Each decking piece shall be nailed to each support.

2304.8.4.2 Nailing. Each piece of decking shall be toenailed at each support with one 16d common nail through the tongue and face-nailed with one 16d common nail.

2304.8.4.3 Controlled random pattern. There shall be a minimum distance of 24 inches (610 mm) between end joints in adjacent courses. The pieces in the first and second courses shall bear on at least two supports with end joints in these two courses occurring on alternate supports. A maximum of seven intervening courses shall be permitted before this pattern is repeated.

2304.8.5 Three- and four-inch sawn tongue-and-groove decking.

2304.8.5.1 General. Three-inch (76 mm) and four-inch (102 mm) decking shall have a maximum moisture content of 19 percent. Decking shall be machined with a double tongue-and-groove pattern. Decking pieces shall be interconnected and nailed to the supports.

2304.8.5.2 Nailing. Each piece shall be toenailed at each support with one 40d common nail and face-nailed with one 60d common nail. Courses shall be spiked to each other with 8 inch (203 mm) spikes at maximum intervals of 30 inches (762 mm) through predrilled edge holes penetrating to a depth of approximately 4 inches (102 mm). One spike shall be installed at a distance not exceeding 10 inches (254 mm) from the end of each piece.

2304.8.5.3 Controlled random pattern. There shall be a minimum distance of 48 inches (1219 mm) between end joints in adjacent courses. Pieces not bearing on a support are permitted to be located in interior bays provided the adjacent pieces in the same course continue over the support for at least 24 inches (610 mm). This condition shall not occur more than once in every six courses in each interior bay.

Committee Reason: This code change fixes the language of the lumber decking provisions that were incorporated into the IBC during the previous code development cycle. The modification makes an additional editorial correction.

Assembly Action:

None

Final Hearing Results

S73-06/07

AM

Code Change No: S74-06/07

Original Proposal

Table 2304.9.1

Proponent: Randall Shackelford, Simpson Strong-Tie Co.

Revise table as follows:

**TABLE 2304.9.1
FASTENING SCHEDULE**

CONNECTION	FASTENING^{a,m}	LOCATION
30. Ledger strip	3 - 16d common (3½" x 0.162") 4 - 3" x 0.131" nails 4 - 3" 14 gage staples	face nail <u>at each joist</u>

Reason: Clarify the code to show where nails must be applied. Fastening was added in the last code change cycle, but location of the fasteners was not added. Fasteners must be located under or near each joist. Legacy codes were silent on this, except for the Standard Building Code, which required "3 at each joist".

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: This proposal provides a useful clarification on the location of nails to be provided for ledger strips.

Assembly Action:

None

Final Hearing Results

S74-06/07

AS

Code Change No: S75-06/07

Original Proposal

Table 2304.9.1; IRC Table R602.3(1)

Proponent: Louis Wagner, American Fiberboard Association

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL AND THE IRC BUILDING/ENERGY CODE DEVELOPMENT COMMITTEES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IBC

Revise as follows:

**TABLE 2304.9.1
FASTENING SCHEDULE**

- i. Corrosion resistant staples with nominal 7/16-inch crown or 1-inch crown and ~~4-1/8~~ 1 1/4-inch length for 1/2-inch sheathing and 1 1/2-inch length for 25/32-inch sheathing. Panel supports at 16 inches (20 inches if strength axis in the long direction of the panel, unless otherwise marked).

(Portions of table and footnotes not shown do not change)

PART II – IRC

Revise as follows:

**TABLE R602.3(1)
FASTENER SCHEDULE FOR STRUCTURAL MEMBERS**

DESCRIPTION OF BUILDING MATERIALS	DESCRIPTION OF FASTENER
1/2" structural cellulosic fiberboard sheathing	1 1/2" galvanized roofing nail, 8d common (2 1/2" X 0.131") nail ; <u>7/16" crown or 1" crown staple 16ga., 4-1/2 1 1/4" long</u>
25/32" structural cellulosic fiberboard sheathing	1 3/4" galvanized roofing nail, 8d common (2 1/2" X 0.131") nail ; <u>7/16" crown or 1" crown staple 16ga., 4-3/4 1 1/2" long</u>

(Portions of table not shown do not change)

Reason: (IBC) This change introduces new information on the use of staples with fiberboard structural sheathing and along with changes to Table 2304.4.4 and IRC Table R602.3(1) will make reference to use of staples with fiberboard consistent within the two codes.

Crown size makes a difference in shear capacity of fiberboard sheathing. See Report number PFS 96-60 available at www.fiberboard.org and being used to revise Table 2304.4.4. The 1 1/8-inch staple is no longer readily available at job sites and should be replaced 1 1/4"-inch staples.

(IRC) This change introduces new information on the use of staples with fiberboard structural sheathing and along with changes to IBC Tables 2304.1 and 2304.4.4 will make reference to fastening of fiberboard consistent within the two codes.

Crown size makes a difference in shear capacity of fiberboard sheathing. See Report number PFS 96-60 available at www.fiberboard.org and being used to revise Table 2304.4.4. 8p common nails are no longer recommended for use with structural sheathing. Staple leg lengths can be shortened based on available proprietary ASTM E72 tests and fastener withdrawal calculations.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

PART I – IBC

Committee Action:

Approved as Submitted

Committee Reason: This code change revises requirements for the attachment of fiberboard sheathing using staples that makes the code more consistent with current industry practice.

Assembly Action:

None

PART II — IRC**Committee Action:****Approved as Submitted****Committee Reason:** This change updates the code to the current best practice for fastening structural fiberboard sheathing.**Assembly Action:****None**

Final Hearing Results

S75-06/07, Part I	AS
S75-06/07, Part II	AS

Code Change No: S76-06/07

Original Proposal

Sections: 2304.9.5; IRC R319.3**THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL AND THE IRC BUILDING/ENERGY CODE DEVELOPMENT COMMITTEES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.****PART I – IBC****Proponent:** Joseph Holland, Hoover Treated Wood Products, Inc.**Delete and substitute as follows:**

~~2304.9.5 Fasteners in preservative-treated and fire-retardant-treated wood.~~ Fasteners for preservative-treated and fire-retardant-treated wood shall be of hot-dipped zinc-coated galvanized steel, stainless steel, silicon bronze or copper. The coating weights for zinc-coated fasteners shall be in accordance with ASTM A 153.

~~Exception:~~ Fasteners other than nails, timber rivets, wood screws and lag screws shall be permitted to be of mechanically deposited zinc-coated steel with coating weights in accordance with ASTM B 695, Class 55 minimum.

Fastenings for wood foundations shall be as required in AF&PA Technical Report No. 7.

2304.9.5 Fasteners in preservative-treated and fire-retardant-treated wood. Fasteners in contact with preservative-treated wood and fire-retardant-treated wood shall be in accordance with this section.

2304.9.5.1 Fasteners for preservative treated wood. Fasteners for preservative-treated wood shall be of hot-dipped zinc-coated galvanized steel, stainless steel, silicon bronze or copper.

Exceptions:

1. One-half-inch (12.7 mm) diameter or greater steel bolts.
2. Fasteners other than nails, timber rivets, wood screws and lag screws shall be permitted to be of mechanically deposited zinc coated steel with coating weights in accordance with ASTM B 695, Class 55 minimum.

2304.9.5.2 Fastenings for wood foundations. Fastenings for wood foundations shall be as required in AF&PA Technical Report No. 7.

2304.9.5.3 Fasteners for fire-retardant-treated wood used in exterior applications or wet or damp locations. Fasteners for fire-retardant-treated wood used in exterior applications or wet or damp locations shall be of hot-dipped zinc-coated galvanized steel, stainless steel, silicon bronze or copper.

2304.9.5.4 Fasteners for fire-retardant-treated wood used in interior applications. Fasteners for fire-retardant-treated wood used in interior locations shall be in accordance with the manufacturer's recommendations. In the absence of manufacturer's recommendations Section 2304.9.5.3 shall apply.

PART II – IRC

Delete and substitute as follows:

R319.3 Fasteners. Fasteners for pressure preservative and fire-retardant-treated wood shall be of hot-dipped zinc-coated galvanized steel, stainless steel, silicon bronze or copper. The coating weights for zinc-coated fasteners shall be in accordance with ASTM A 153.

Exceptions:

1. One-half-inch (12.7mm) diameter or greater steel bolts.
2. Fasteners other than nails, timber rivets, wood screws and lag screws shall be permitted to be of mechanically deposited zinc-coated steel with coating weights in accordance with ASTM B 695, Class 55 minimum.

Fastenings for wood foundations shall be as required in AF&PA Technical Report No. 7.

R319.3 Fasteners in preservative-treated and fire-retardant-treated wood. Fasteners in contact with preservative-treated wood and fire-retardant-treated wood shall be in accordance with this section.

R319.3.1 Fasteners for Preservative Treated Wood. Fasteners for preservative-treated wood shall be of hot-dipped zinc-coated galvanized steel, stainless steel, silicon bronze or copper.

Exceptions:

1. One-half-inch (12.7 mm) diameter or greater steel bolts.
2. Fasteners other than nails, timber rivets, wood screws and lag screws shall be permitted to be of mechanically deposited zinc coated steel with coating weights in accordance with ASTM B 695, Class 55 minimum.

R319.3.2 Fastenings for wood foundations. Fastenings for wood foundations shall be as required in AF&PA Technical Report No. 7.

R319.3.3 Fasteners for fire-retardant-treated wood used in exterior applications or wet or damp locations. Fasteners for fire-retardant-treated wood used in exterior applications or wet or damp locations shall be of hot-dipped zinc-coated galvanized steel, stainless steel, silicon bronze or copper.

R319.3.4 Fasteners for fire-retardant-treated wood used in interior applications. Fasteners for fire-retardant-treated wood used in interior locations shall be in accordance with the manufacturer's recommendations. In the absence of manufacturer's recommendations Section R 319.3.3 shall apply.

Reason: 1. Bring in the exception for ½ bolts from the IRC into the IBC. 2. Recognize the different exposures for fire-retardant-treated wood and the fastener requirements for the exposure.

The interior exposure for FRTW is far less severe than the exposure for FRTW in wet, damp, or exterior locations. Until this year manufactures of FRTW used the code compliance report (BOCA, ICBO, NER, and SBCCI) to make their recommendations for the appropriate fastener for FRTW. With the consolidation of the code groups and the introduction of the ICC-ES system that is no longer allowed. The ICC-ES's position is the code over rules any testing a manufacturer has done for determining the appropriate fastener for FRTW.

Substantiation: FRTW for interior uses have not experienced problems with corrosion of fasteners used in contact with the wood. The manufacturers have satisfactorily used their recommendations for fasteners for more than 25 years. This change eliminates confusion between the code and the recommendations of the manufacturer.

Cost Impact: The code change proposal will not increase the cost of construction it will reduce the cost and allow the use of an appropriate fastener for the application.

Public Hearing Results

PART I — IBC
Committee Action:

Disapproved

Committee Reason: This code change was disapproved because the proposed splitting of fire-retardant-treated wood requirements into interior and exterior was not substantiated.

Assembly Action:

None

**PART II — IRC
Committee Action:**

Approved as Modified

Modify the proposal as follows:

R319.3 Fasteners in preservative-treated and fire-retardant-treated wood. Fasteners in contact with preservative-treated wood and fire-retardant-treated wood shall be in accordance with this section. The coating weights for zinc-coated fasteners shall be in accordance with ASTM A 153.

(Portions of proposal not shown remain unchanged)

Committee Reason: This new language provides clarity to the code user on fasteners and their application when utilizing fire-retardant treated wood. The modification provides a needed reference to ASTM A 153 which was deleted in the original code change.

Assembly Action:

None

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because public comments were submitted for Part I.

Public Comment 1:

Joseph Holland, Hoover Treated Wood Products, requests Approval as Modified by this public comment for Part I.

Modify proposal as follows:

2304.9.5 Fasteners in preservative-treated and fire-retardant-treated wood. Fasteners for preservative treated and fire-retardant-treated wood shall be in accordance with Section 2304.9.5.1 through 2304.9.5.4. ~~4 of hot-dipped zinc-coated galvanized steel, stainless steel, silicon bronze or copper.~~ The coating weights for zinc-coated fasteners shall be in accordance with ASTM A 153.

Exception: ~~Fasteners other than nails, timber rivets, wood screws and lag screws shall be permitted to be of mechanically deposited zinc coated steel with coating weights in accordance with ASTM B695, Class 55 minimum.~~

~~Fastenings for wood foundations shall be as required in AF&PA Technical Report No. 7.~~

2304.9.5.1 Fasteners for preservative treated wood. Fasteners for preservative-treated wood shall be of hot-dipped zinc-coated galvanized steel, stainless steel, silicon bronze or copper. Fasteners other than nails, timber rivets, wood screws and lag screws shall be permitted to be of mechanically deposited zinc coated steel with coating weights in accordance with ASTM B695, Class 55 minimum.

2304.9.5.2 Fastenings for wood foundations. Fastenings for wood foundations shall be as required in AF&PA Technical Report No. 7.

2304.9.5.3 Fasteners for fire-retardant-treated wood used in exterior applications or wet or damp locations. Fasteners for fire-retardant-treated wood used in exterior applications or wet or damp locations shall be of hot-dipped zinc-coated galvanized steel, stainless steel, silicon bronze or copper. Fasteners other than nails, timber rivets, wood screws and lag screws shall be permitted to be of mechanically deposited zinc coated steel with coating weights in accordance with ASTM B695, Class 55 minimum.

2304.9.5.4 Fasteners for fire-retardant-treated wood used in interior applications. Fasteners for fire-retardant-treated wood used in interior locations shall be in accordance with the manufacturer's recommendations. In the absence of manufacturer's recommendations Section 2304.9.5.3 shall apply.

Commenter's Reason: The original submission was taken from the 2003 IBC and the exception in the 2003 IRC. There were changes made to the 2006 editions not incorporated into the submission. This modification incorporates the 2006 language and drops the exception from the IRC. In addition section 2304.9.5.3 incorporates the language from the exception for timber rivets, wood screws and lag screws for FRTW used in wet or damp locations and in exterior exposures.

This modification will recognize the fasteners being used for FRTW for more than 25 years.

Final Hearing Results

S76-06/07, Part I
S76-06/07, Part II

AMPC1
AM

Code Change No: **S81-06/07**

Original Proposal

Sections: 2304.11.2.5; IRC R319.1

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL AND THE IRC BUILDING/ENERGY CODE DEVELOPMENT COMMITTEES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

Proponent: Dennis Pitts, American Forest & Paper Association

PART I – IBC

Revise as follows:

2304.11.2.5 Wood siding. Clearance between wood siding and earth on the exterior of a building shall not be less than 6 inches (152 mm) or less than 2 inches (51 mm) from concrete steps, porch slabs, patio slabs, and similar horizontal surfaces exposed to the weather except where siding, sheathing, and wall framing are of naturally durable or preservative-treated wood.

PART II – IRC

Revise as follows:

R319.1 Location required. Protection from decay shall be provided in the following locations by the use of naturally durable wood or wood that is preservative treated in accordance with AWPA U1 for the species, product, preservative and end use. Preservatives shall be listed in Section 4 of AWPA U1.

1. Wood joists or the bottom of a wood structural floor when closer than 18 inches (457 mm) or wood girders when closer than 12 inches (305 mm) to the exposed ground in crawl spaces or unexcavated area located within the periphery of the building foundation.
2. All wood framing members that rest on concrete or masonry exterior foundation walls and are less than 8 inches (203 mm) from the exposed ground.
3. Sills and sleepers on a concrete or masonry slab that is in direct contact with the ground unless separated from such slab by an impervious moisture barrier.
4. The ends of wood girders entering exterior masonry or concrete walls having clearances of less than 0.5 inch (12.7 mm) on tops, sides and ends.
5. Wood siding, sheathing and wall framing on the exterior of a building having a clearance of less than 6 inches (152 mm) from the ground or less than 2 inches (51 mm) from concrete steps, porch slabs, patio slabs, and similar horizontal surfaces exposed to the weather.

No change to items 6 and 7.

Reason: The existing text should result in wood materials being at least 2" from the surface of typical 4"-thick concrete walks and porch slabs if the required minimum of 6" distance from the ground is maintained. In practice, however, it's not unusual to see less than 2" clearance. Without a minimum clearance water that may collect on the concrete can result in decay in the wood. Additionally, sufficient clearance to check for termite tubes may not be maintained.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

PART I — IBC

Committee Action:

Approved as Modified

Modify the proposal as follows:

2304.11.2.5 Wood siding. Clearance between wood siding and earth on the exterior of a building shall not be less than 6 inches (152 mm) or less than 2 inches (51 mm) vertical from concrete steps, porch slabs, patio slabs, and similar horizontal surfaces exposed to the weather except where siding, sheathing, and wall framing are of naturally durable or preservative-treated wood.

Committee Reason: The proposal will minimize the exposure of wood siding to decay by elaborating on the minimum clearance requirements at horizontal concrete surfaces. The modification is intended to clarify that the clearance is measured vertically.

Assembly Action:

None

PART II — IRC

Committee Action:

Approved as Modified

Modify the proposal as follows:

R319.1 Location required. Protection from decay shall be provided in the following locations by the use of naturally durable wood or wood that is preservative treated in accordance with AWPAC U1 for the species, product, preservative and end use. Preservatives shall be listed in Section 4 of AWPAC U1.

1. through 4. (No change to current text)
5. Wood siding, sheathing and wall framing on the exterior of a building having a clearance of less than 6 inches (152 mm) from the ground or less than 2 inches (51 mm) measured vertically from concrete steps, porch slabs, patio slabs and similar horizontal surfaces exposed to the weather.

Committee Reason: This additional language helps provide a usable measure criteria for material clearances. Without a minimum clearance water that collects on the concrete can result in decay of the wood. The modification specifically calls out that the measurement must be made vertically from concrete steps.

Assembly Action:

None

Final Hearing Results

S81-06/07, Part I
S81-06/07, Part II

AM
AM

Code Change No: S82-06/07

Original Proposal

Sections: 2305, 1613.6.1, Table 2306.4.5

Proponent: Jeffrey B. Stone, American Forest & Paper Association

Revise as follows:

SECTION 2305 GENERAL DESIGN REQUIREMENTS FOR LATERAL-FORCE-RESISTING SYSTEMS

2305.1 General. Structures using wood shear walls and diaphragms to resist wind, seismic and other lateral loads shall be designed and constructed in accordance with AF&PA SDPWS and the provisions of Section 2305, 2306, and 2307, the provisions of this section. ~~Alternatively, compliance with the AF&PA SDPWS shall be permitted subject to the limitations therein and the limitations of this code.~~

2305.1.1 Shear resistance based on principles of mechanics. ~~Shear resistance of diaphragms and shear walls are permitted to be calculated by principles of mechanics using values of fastener strength and sheathing shear resistance.~~

2305.1.2 Framing. ~~Boundary elements shall be provided to transmit tension and compression forces. Perimeter members at openings shall be provided and shall be detailed to distribute the shearing stresses. Diaphragm and shear wall sheathing shall not be used to splice boundary elements. Diaphragm chords and collectors shall be placed in, or tangent to, the plane of the diaphragm framing unless it can be demonstrated that the moments, shears and deformations, considering eccentricities resulting from other configurations can be tolerated without exceeding the adjusted resistance and drift limits.~~

2305.1.2.1 Framing members. Framing members shall be at least 2 inch (51 mm) nominal width. In general, adjoining panel edges shall bear and be attached to the framing members and butt along their centerlines. Nails shall be placed not less than 3/8 inch (9.5 mm) from the panel edge, not more than 12 inches (305 mm) apart along intermediate supports, and 6 inches (152 mm) along panel edge bearings, and shall be firmly driven into the framing members.

2305.1.3 2305.1.1 Openings in shear panels. Openings in shear panels that materially affect their strength shall be fully detailed on the plans, and shall have their edges adequately reinforced to transfer all shearing stresses.

2305.1.4 Shear panel connections. Positive connections and anchorages capable of resisting the design forces shall be provided between the shear panel and the attached components. In Seismic Design Category D, E or F, the capacity of toenail connections shall not be used when calculating lateral load resistance to transfer lateral earthquake forces in excess of 150 pounds per foot (2189 N/m) from diaphragms to shear walls, drag struts (collectors) or other elements, or from shear walls to other elements.

2305.1.5 Wood members resisting horizontal seismic forces contributed by masonry and concrete walls. Wood shear walls, diaphragms, horizontal trusses and other members shall not be used to resist horizontal seismic forces contributed by masonry or concrete walls in structures over one story in height.

Exceptions:

1. Wood floor and roof members are permitted to be used in horizontal trusses and diaphragms to resist horizontal seismic forces contributed by masonry or concrete walls, provided such forces do not result in torsional force distribution through the truss or diaphragm.
2. Wood structural panel sheathed shear walls are permitted to be used to provide resistance to seismic forces contributed by masonry or concrete walls in two-story structures of masonry or concrete walls, provided the following requirements are met:
 - 2.1. Story-to-story wall heights shall not exceed 12 feet (3658 mm).
 - 2.2. Diaphragms shall not be designed to transmit lateral forces by rotation and shall not cantilever past the outermost supporting shear wall.
 - 2.3. Combined deflections of diaphragms and shear walls shall not permit story drift of supported masonry or concrete walls to exceed the limit of Section 12.12.1 in ASCE 7.
 - 2.4. Wood structural panel sheathing in diaphragms shall have unsupported edges blocked. Wood structural panel sheathing for both stories of shear walls shall have 2 unsupported edges blocked and, for the lower story, shall have a minimum thickness of 15/32 inch (11.9 mm).
 - 2.5. There shall be no out-of-plane horizontal offsets between the first and second stories of wood structural panel shear walls.

2305.1.6 Wood members resisting seismic forces from nonstructural concrete or masonry. Wood members shall be permitted to resist horizontal seismic forces from nonstructural concrete, masonry veneer or concrete floors.

2305.2 Design of wood diaphragms.

2305.2.1 General. Wood diaphragms are permitted to be used to resist horizontal forces provided the deflection in the plane of the diaphragm, as determined by calculations, tests or analogies drawn therefrom, does not exceed the permissible deflection of attached distributing or resisting elements. Connections shall extend into the diaphragm a sufficient distance to develop the force transferred into the diaphragm.

2305.2.2 2305.2 Diaphragm Deflection. Permissible deflection shall be that deflection up to which the diaphragm and any attached distributing or resisting element will maintain its structural integrity under design load conditions, such that the resisting element will continue to support design loads without danger to occupants of the structure. Calculations for diaphragm deflection shall account for the usual bending and shear components as well as any other factors, such as nail deformation, which will contribute to deflection. The deflection (Δ) of a blocked wood structural panel diaphragm uniformly nailed fastened throughout is permitted to be calculated by using the following equation. If not uniformly nailed fastened, the constant 0.188 (For SI: 1/1627) in the third term must be modified accordingly.

$$\Delta = \frac{5vL^3}{8EAb} + \frac{vL}{4Gt} + 0.188Le_n + \frac{\sum(\Delta_c X)}{2b} \quad \text{(Equation 23-1)}$$

$$\text{For SI: } \Delta = \frac{0.052vL^3}{EAb} + \frac{vL}{4Gt} + \frac{Le_n}{1627} + \frac{\sum(\Delta_c X)}{2b}$$

Where:

A = Area of chord cross section, in square inches (mm²).

B = Diaphragm width, in feet (mm).

E = Elastic modulus of chords, in pounds per square inch (N/mm²).

~~e_n = Nail or staple~~ ~~Staple~~ deformation, in inches (mm) [see Table 2305.2.2(1)].

Gt = Panel rigidity through the thickness, in pounds per inch (N/mm) of panel width or depth [see Table 2305.2.2(2)].

L = Diaphragm length, in feet (mm).

v = Maximum shear due to design loads in the direction under consideration, in pounds per linear foot (plf) (N/mm).

Δ = The calculated deflection, in inches (mm).

Σ(Δ_cX) = Sum of individual chord-splice slip values on both sides of the diaphragm, each multiplied by its distance to the nearest support.

TABLE 2305.2.2(1) 2305.2(1)
e_n VALUES (inches) FOR USE IN CALCULATING DIAPHRAGM DEFLECTION DUE TO FASTENER SLIP
(Structural I)^{ad}

LOAD PER FASTENER ^c (pounds)	FASTENER DESIGNATIONS ^b			
	6d	8d	10d	14-Ga staple x 2 inches long
60	0.04	0.00	0.00	0.011
80	0.02	0.01	0.01	0.018
100	0.03	0.01	0.01	0.028
120	0.04	0.02	0.01	0.04
140	0.06	0.03	0.02	0.053
160	0.10	0.04	0.02	0.068
180	-	0.05	0.03	-
200	-	0.07	0.47	-
220	-	0.09	0.06	-
240	-	-	0.07	-

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound = 4.448 N.

a. Increase e_n values 20 percent for plywood grades other than Structural I.

~~b. Nail values apply to common wire nails or staples identified.~~

c. Load per fastener = maximum shear per foot divided by the number of fasteners per foot at interior panel edges.

d. Decrease e_n values 50 percent for seasoned lumber (moisture content < 19 percent).

TABLE 2305.2.2(2) 2305.2(2)
VALUES OF Gt FOR USE IN CALCULATING DEFLECTION OF WOOD STRUCTURAL PANEL SHEAR WALLS AND DIAPHRAGMS

(No change to table entries)

2305.2.3 Diaphragm aspect ratios. Size and shape of diaphragms shall be limited as set forth in Table 2305.2.3.

TABLE 2305.2.3
MAXIMUM DIAPHRAGM DIMENSION RATIOS
HORIZONTAL AND SLOPED DIAPHRAGM

2305.2.4 Construction. Wood diaphragms shall be constructed of wood structural panels manufactured with exterior glue and not less than 4 feet by 8 feet (1219mm by 2438 mm), except at boundaries and changes in framing where minimum sheet dimension shall be 24 inches (610 mm) unless all edges of the undersized sheets are supported by and fastened to framing members or blocking. Wood structural panel thickness for horizontal diaphragms shall not be less than the values set forth in Tables 2304.7(3), 2304.7(4) and 2304.7(5) for corresponding joist spacing and loads.

2305.2.4.1 Seismic Design Category F. Structures assigned to Seismic Design Category F shall conform to the additional requirements of this section. Wood structural panel sheathing used for diaphragms and shear walls that are part of the seismic force-resisting system shall be applied directly to the framing members.

Exception: Wood structural panel sheathing in a diaphragm is permitted to be fastened over solid lumber planking or laminated decking, provided the panel joints and lumber planking or laminated decking joints do not coincide.

2305.2.5 Rigid diaphragms. Design of structures with rigid diaphragms shall conform to the structure configuration requirements of Section 12.3.2 of ASCE 7 and the horizontal shear distribution requirements of Section 12.8.4 of ASCE 7. Open front structures with rigid wood diaphragms resulting in torsional force distribution are permitted, provided the length, *l*, of the diaphragm normal to the open side does not exceed 25 feet (7620 mm), the diaphragm sheathing conforms to Section 2305.2.4 and the *l/w* ratio [as shown in Figure 2305.2.5(1)] is less than 1 for one-story structures or 0.67 for structures over one story in height. **Exception:** Where calculations show that diaphragm deflections can be tolerated, the length, *l*, normal to the open end is permitted to be increased to a *l/w* ratio not greater than 1.5 where sheathed in compliance with Section 2305.2.4 or to 1 where sheathed in compliance with Section 2306.3.4 or 2306.3.5.

Rigid wood diaphragms are permitted to cantilever past the outermost supporting shearwall (or other vertical resisting element) a length, *l*, of not more than 25 feet (7620 mm) or two-thirds of the diaphragm width, *w*, whichever is smaller. Figure 2305.2.5(2) illustrates the dimensions of *l* and *w* for a cantilevered diaphragm.

Structures with rigid wood diaphragms having a torsional irregularity in accordance with Table 12.3-1, Item 1, of ASCE 7 shall meet the following requirements: the *l/w* ratio shall not exceed 1 for one-story structures or 0.67 for structures over one story in height, where *l* is the dimension parallel to the load direction for which the irregularity exists.

Exception: Where calculations demonstrate that the diaphragm deflections can be tolerated, the width is permitted to be increased and the *l/w* ratio is permitted to be increased to 1.5 where sheathed in compliance with Section 2305.2.4 or 1 where sheathed in compliance with Section 2306.3.4 or 2306.3.5.

**FIGURE 2305.2.5(1)
DIAPHRAGM LENGTH AND WIDTH FOR PLAN VIEW OF OPEN FRONT BUILDING**

**FIGURE 2305.2.5(2)
DIAPHRAGM LENGTH AND WIDTH FOR PLAN VIEW OF CANTILEVERED DIAPHRAGM**

2305.3 Design of wood shear walls.

2305.3.1 General. Wood shear walls are permitted to resist horizontal forces in vertical distributing or resisting elements, provided the deflection in the plane of the shear wall, as determined by calculations, tests or analogies drawn there from, does not exceed the more restrictive of the permissible deflection of attached distributing or resisting elements or the drift limits of Section 12.12.1 of ASCE 7. Shear wall sheathing other than wood structural panels shall not be permitted in Seismic Design Category E or F (see Section 1613).

2305.3.2 2305.3 Shear wall Deflection. Permissible deflection shall be that deflection up to which the shear wall and any attached distributing or resisting element will maintain its structural integrity under design load conditions, i.e., continue to support design loads without danger to occupants of the structure. The deflection (Δ) of a blocked wood structural panel shear wall uniformly fastened throughout is permitted to be calculated by the use of the following equation:

$$\Delta = \frac{8vh^3}{EAb} + \frac{vh}{Gt} + 0.75he_n + d_a \frac{h}{b} \quad \text{(Equation 23-2)}$$

For SI:
$$\Delta = \frac{vh^3}{3EAb} + \frac{vh}{Gt} + \frac{he_n}{407.6} + d_a \frac{h}{b}$$

where:

- A = Area of boundary element cross section in square inches (mm²) (vertical member at shear wall boundary).
- b = Wall width, in feet (mm).
- d_a = Vertical elongation of overturning anchorage (including fastener slip, device elongation, anchor rod elongation, etc.) at the design shear load (*v*).
- E = Elastic modulus of boundary element (vertical member at shear wall boundary), in pounds per square inch (N/mm²).
- e_n = Nail or staple ~~Staple~~ deformation, in inches (mm) [see Table 2305.2.2(2)].
- Gt = Panel rigidity through the thickness, in pounds per inch (N/mm) of panel width or depth [see Table 2305.2.2(2)].

- H = Wall height, in feet (mm).
 v = Maximum shear due to design loads at the top of the wall, in pounds per linear foot (N/mm).
 Δ = The calculated deflection, in inches (mm).

2305.3.3 Construction. Wood shear walls shall be constructed of wood structural panels manufactured with exterior glue and not less than 4 feet by 8 feet (1219mm by 2438 mm), except at boundaries and at changes in framing. All edges of all panels shall be supported by and fastened to framing members or blocking. Wood structural panel thickness for shear walls shall not be less than set forth in Table 2304.6.1 for corresponding framing spacing and loads, except that 1/4 inch (6.4 mm) is permitted to be used where perpendicular loads permit.

2305.3.4 Shear wall aspect ratios. Size and shape of shear walls, perforated shear wall segments within perforated shear walls and wall piers within shear walls that are designed for force transfer around openings shall be limited as set forth in Table 2305.3.4. The height, h , and the width, w , shall be determined in accordance with Sections 2305.3.5 through 2305.3.5.2 and 2305.3.6 through 2305.3.6.2, respectively.

**TABLE 2305.3.4
 MAXIMUM SHEAR WALL DIMENSION RATIOS**

2305.3.5 Shear wall height definition. The height of a shear wall, h , shall be defined as:

1. The maximum clear height from the top of the foundation to the bottom of the diaphragm framing above; or
2. The maximum clear height from the top of the diaphragm to the bottom of the diaphragm framing above [see Figure 2305.3.5(a)].

2305.3.5.1 Perforated shear wall segment height definition. The height of a perforated shear wall segment, h , shall be defined as specified in Section 2305.3.5 for shear walls.

2305.3.5.2 Force transfer shear wall pier height definition. The height, h , of a wall pier in a shear wall with openings designed for force transfer around openings shall be defined as the clear height of the pier at the side of an opening [see Figure 2305.3.5(b)].

2305.3.6 Shear wall width definition. The width of a shear wall, w , shall be defined as the sheathed dimension of the shear wall in the direction of application of force [see Figure 2305.3.5(a)].

2305.3.6.1 Perforated shear wall segment width definition. The width of a perforated shear wall segment, w , shall be defined as the width of full-height sheathing adjacent to openings in the perforated shear wall [see Figure 2305.3.5(a)].

2305.3.6.2 Force transfer shear wall pier width definition. The width, w , of a wall pier in a shear wall with openings designed for force transfer around openings shall be defined as the sheathed width of the pier at the side of an opening [see Figure 2305.3.5(b)].

2305.3.7 Overturning restraint. Where the dead load stabilizing moment in accordance with Chapter 16 allowable stress design load combinations is not sufficient to prevent uplift due to overturning moments on the wall, an anchoring device shall be provided. Anchoring devices shall maintain a continuous load path to the foundation.

2305.3.8 Shear walls with openings. The provisions of this section shall apply to the design of shear walls with openings. Where framing and connections around the openings are designed for force transfer around the openings, the provisions of Section 2305.3.8.1 shall apply. Where framing and connections around the openings are not designed for force transfer around the openings, the provisions of Section 2305.3.8.2 shall apply.

2305.3.8.1 Force transfer around openings. Where shear walls with openings are designed for force transfer around the openings, the limitations of Table 2305.3.4 shall apply to the overall shear wall, including openings, and to each wall pier at the side of an opening. Design for force transfer shall be based on a rational analysis. Detailing of boundary elements around the opening shall be provided in accordance with the provisions of this section [see Figure 2305.3.5(b)].

2305.3.8.2 Perforated shear walls. The provisions of Section 2305.3.8.2 shall be permitted to be used for the design of perforated shear walls. For the determination of the height and width of perforated shear wall segments, see Sections 2305.3.5.1 and 2305.3.6.1, respectively.

2305.3.8.2.1 Limitations. The following limitations shall apply to the use of Section 2305.3.8.2:

1. A perforated shear wall segment shall be located at each end of a perforated shear wall. Openings shall be permitted to occur beyond the ends of the perforated shear wall, provided the width of such openings is not be included in the width of the perforated shear wall.
2. The allowable shear set forth in Table 2306.4.1 shall not exceed 490 plf (7150 N/m).
3. Where out-of-plane offsets occur, portions of the wall on each side of the offset shall be considered as separate perforated shear walls.
4. Collectors for shear transfer shall be provided through the full length of the perforated shear wall.
5. A perforated shear wall shall have uniform top-of-wall and bottom-of-wall elevations. Perforated shear walls not having uniform elevations shall be designed by other methods.
6. Perforated shear wall height, h , shall not exceed 20 feet (6096 mm).

2305.3.8.2.2 Perforated shear wall resistance. The resistance of a perforated shear wall shall be calculated in accordance with the following:

1. The percentage of full-height sheathing shall be calculated as the sum of the widths of perforated shear wall segments divided by the total width of the perforated shear wall, including openings.
2. The maximum opening height shall be taken as the maximum opening clear height. Where areas above and below an opening remain unsheathed, the height of the opening shall be defined as the height of the wall.
3. The unadjusted shear resistance shall be the allowable shear set forth in Table 2306.4.1 for height-to-width ratios of perforated shear wall segments that do not exceed 2:1 for seismic forces and 3 1/2:1 for other than seismic forces. For seismic forces, where the height-to-width ratio of any perforated shear wall segment used in the calculation of the sum of the widths of perforated shear wall segments, $\sum L_i$, is greater than 2:1 but does not exceed 3 1/2:1, the unadjusted shear resistance shall be multiplied by $2 w/h$.
4. The adjusted shear resistance shall be calculated by multiplying the unadjusted shear resistance by the shear resistance adjustment factors of Table 2305.3.8.2. For intermediate percentages of full-height sheathing, the values in Table 2305.3.8.2 are permitted to be interpolated.
5. The perforated shear wall resistance shall be equal to the adjusted shear resistance times the sum of the widths of the perforated shear wall segments.

2305.3.8.2.3 Anchorage and load path. Design of perforated shear wall anchorage and load path shall conform to the requirements of Sections 2305.3.8.2.4 through 2305.3.8.2.8, or shall be calculated using principles of mechanics. Except as modified by these sections, wall framing, sheathing, sheathing attachment and fastener schedules shall conform to the requirements of Section 2305.2.4 and Table 2306.4.1.

2305.3.8.2.4 Uplift anchorage at perforated shear wall ends. Anchorage for uplift forces due to overturning shall be provided at each end of the perforated shear wall. The uplift anchorage shall conform to the requirements of Section 2305.3.7, except that for each story the minimum tension chord uplift force, T , shall be calculated in accordance with the following:

(Equation 23-3)

**TABLE 2305.3.8.2
SHEAR RESISTANCE ADJUSTMENT FACTOR, C_o
WALL HEIGHT, H**

**FIGURE 2305.3.5
GENERAL DEFINITION OF SHEAR WALL HEIGHT, WIDTH AND HEIGHT-TO-WIDTH RATIO**

2305.3.8.2.5 Anchorage for in-plane shear. The unit shear force, v , transmitted into the top of a perforated shear wall, out of the base of the perforated shear wall at full height sheathing and into collectors connecting shear wall segments shall be calculated in accordance with the following:

(Equation 23-4)

2305.3.8.2.6 Uplift anchorage between perforated shear wall ends. In addition to the requirements of Section 2305.3.8.2.4, perforated shear wall bottom plates at full height sheathing shall be anchored for a uniform uplift force, t , equal to the unit shear force, v , determined in Section 2305.3.8.2.5.

2305.3.8.2.7 Compression chords. Each end of each perforated shear wall segment shall be designed for a compression chord force, C , equal to the tension chord uplift force, T , calculated in Section 2305.3.8.2.4.

2305.3.8.2.8 Load path. Load path. A load path to the foundation shall be provided for each uplift force, T and t , for each shear force, V and v , and for each compression chord force, C . Elements resisting shearwall forces contributed by multiple stories shall be designed for the sum of forces contributed by each story.

2305.3.8.2.9 Deflection of shear walls with openings. The controlling deflection of a blocked shearwall with openings uniformly fastened throughout shall be taken as the maximum individual deflection of the shear wall segments calculated in accordance with Section 2305.3.2, divided by the appropriate shear resistance adjustment factors of Table 2305.3.8.2.

2305.3.9 Summing shear capacities. The shear values for shear panels of different capacities applied to the same side of the wall are not cumulative except as allowed in Table 2306.4.1.

The shear values for material of the same type and capacity applied to both faces of the same wall are cumulative. Where the material capacities are not equal, the allowable shear shall be either two times the smaller shear capacity or the capacity of the stronger side, whichever is greater.

Summing shear capacities of dissimilar materials applied to opposite faces or to the same wall line is not allowed.

Exception: For wind design, the allowable shear capacity of shear wall segments sheathed with a combination of wood structural panels and gypsum wallboard on opposite faces, fiberboard structural sheathing and gypsum wallboard on opposite faces or hardboard panel siding and gypsum wallboard on opposite faces shall equal the sum of the sheathing capacities of each face separately.

2305.3.10 Adhesives. Adhesive attachment of shear wall sheathing is not permitted as a substitute for mechanical fasteners, and shall not be used in shear wall strength calculations alone, or in combination with mechanical fasteners in Seismic Design Category D, E or F.

2305.3.11 Sill plate size and anchorage in Seismic Design Category D, E or F. Anchor bolts for shear walls shall include steel plate washers, a minimum of 0.229 inch by 3 inches by 3 inches (5.82 mm by 76 mm by 76 mm) in size, between the sill plate and nut. The hole in the plate washer is permitted to be diagonally slotted with a width of up to 3/16 inch (4.76 mm) larger than the bolt diameter and a slot length not to exceed 13/4 inches (44 mm), provided a standard cut washer is placed between the plate washer and the nut. Sill plates resisting a design load greater than 490 plf (7154 N/m) using load and resistance factor design or 350 plf (5110 N/m) using allowable stress design shall not be less than a 3-inch (76 mm) nominal member. Where a single 3-inch (76 mm) nominal sill plate is used, 2-20d box end nails shall be substituted for 2-16d common end nails found in line 8 of Table 2304.9.1.

Exception: In shear walls where the design load is greater than 490 plf (7154 N/m) but less than 840 plf (12264 N/m) using load and resistance factor design or greater than 350 plf (5110 N/m) but less than 600 plf (8760 N/m) using allowable stress design, the sill plate is permitted to be a 2-inch (51 mm) nominal member if the sill plate is anchored by two times the number of bolts required by design and 0.229-inch by 3-inch by 3-inch (5.82mm by 76mm by 76mm) plate washers are used.

1613.6.1 Assumption of flexible diaphragm. Add the following text at the end of Section 12.3.1.1 of ASCE 7: Diaphragms constructed of wood structural panels or untopped steel decking shall also be permitted to be idealized as flexible, provided all of the following conditions are met:

1. Toppings of concrete or similar materials are not placed over wood structural panel diaphragms except for nonstructural toppings no greater than 1 1/2 inches (38 mm) thick.
2. Each line of vertical elements of the lateral-force-resisting system complies with the allowable story drift of Table 12.12-1.
3. Vertical elements of the lateral-force-resisting system are light-framed walls sheathed with wood structural panels rated for shear resistance or steel sheets.
4. Portions of wood structural panel diaphragms that cantilever beyond the vertical elements of the lateral-force-resisting system are designed in accordance with Section 2305.2.5 4.2.5.2 of AF & PA SDPWS the International Building Code.

TABLE 2306.4.5
ALLOWABLE SHEAR FOR WIND OR SEISMIC FORCES FOR SHEAR WALLS OF LATH
AND PLASTER OR GYPSUM BOARD WOOD FRAMED WALL ASSEMBLIES
(No change to table entries)

- a. These shear walls shall not be used to resist loads imposed by masonry or concrete construction (see Section 2305.1.5) walls (see Section 4.1.5 of AF & PA SDPWS). Values shown are for short-term loading due to wind or seismic loading. Walls resisting seismic loads shall be subject to the limitations in Section 12.2.1 of ASCE 7. Values shown shall be reduced 25 percent for normal loading.
- b. through k. (No change to current text)

CODE CHANGES RESOURCE COLLECTION – INTERNATIONAL BUILDING CODE

Reason: Revision of Section 2305: Provisions being deleted from Section 2305 of the IBC are contained in *ANSI/AF&PA NDS Supplement “Special Design Provisions for Wind and Seismic” (SDPWS)* which is currently adopted by reference. These provisions are primarily for the building designer and duplication of the provisions not only is unnecessary, but duplication causes confusion. It is proper that all the design provisions be contained in a single document. Provisions of IBC-2006 Section 2305 are covered in the SDPWS-05 as shown in the following Table 2305.

Table 2305. Comparison of IBC-2006 Section 2305 and SDPWS-05

IBC-2006	SDPWS-05	Comment
2305.1.1	4.1.2	Same
2305.1.2	4.1.4	Same
2305.1.2.1	3.1.1, 4.2.7, 4.3.7	Same
2305.1.3	4.3.5	This sentence is retained because a specific requirement to detail on plans the reinforcing of holes in shear panels is not included in SDPWS. Requirements for force transfer for shear walls with openings are covered in SDPWS 4.3.5 and SDPWS includes general criteria by reference to NDS for ASD and LRFD which addresses effect of net section on design.
2305.1.4	4.1.7	Same
2305.1.5	4.1.5	Same
2305.1.6	4.1.6	Same
2305.2.1	4.2.1	Same
2305.2.2	4.2.2	Same in substance, however, SDPWS does not address deflection calculations for stapled diaphragms. Therefore, the diaphragm deflection equation and staple slip values are being retained. For nailed diaphragms, the SDPWS Simplified deflection equation has the same basis as Eq. 23-1. Use of Eq. 23-1 is permitted as an alternative and necessary equation inputs are provided in SDPWS Commentary. Stiffness properties for diaphragm construction other than wood structural panel are given in SDPWS for purposes of complying with drift and diaphragm flexibility requirements specified elsewhere in the building code.
2305.2.3	4.2.4	Same
Table 2305.2.3	Table 4.2.4	Same
2305.2.4	4.2.7	Same
2305.2.4.1	4.2.7.1	Same except attachment of sheathing directly to framing is generally required in SDPWS and not a special detail for SDC F. Expanded criteria are provided in SDPWS for wood structural panel over lumber decking.
2305.2.5	4.2.5	Same
2305.3.1	4.3.1	Same
2305.3.2	4.3.1, 4.3.2	Same in substance, however, SDPWS does not address deflection calculations for stapled shear walls. Therefore, the shear wall deflection equation and staple slip values are being retained. The SDPWS simplified deflection equation has the same basis as Eq. 23-2. Use of Eq. 23-2 is permitted as an alternative and necessary equation inputs are provided in SDPWS Commentary. Stiffness properties for shear wall construction other than wood structural panel are given in SDPWS for purposes of complying with drift and stiffness compatibility requirements specified elsewhere in the building code.
2305.3.3	4.3.7	Same
2305.3.4	4.3.4, 4.3.5	Same
Table 2305.3.4	Table 4.3.4	Same
2305.3.5	2.3	Same
2305.3.5.1	2.3	Same
2305.3.5.2	4.3.5.2	Same
2305.3.6	2.3	Same
2305.3.6.1	2.3	Same
2305.3.6.2	4.3.5.2	Same
2305.3.7	4.3.6.4.2	Same in substance except SDPWS language is applicable to designs in accordance with both ASD and LRFD methods.
2305.3.8	4.3.5	Same
2305.3.8.1	4.3.5.2	Same
2305.3.8.2	4.3.5.3	Same
2305.3.8.2.1	4.3.5.3	Same in substance except SDPWS language is applicable to designs in accordance with both ASD and LRFD methods. SDPWS language clarifies perforated shear wall sheathing limitations for one-sided and two-sided walls and for walls resisting wind and seismic.
2305.3.8.2.2	4.3.3.4, 4.3.4.1	Same
2305.3.8.2.3	4.3.6	Same
2305.3.8.2.4	4.3.6.1.2	Same
Table 2305.3.8.2	Table 4.3.2.1	Same
Figure 2305.3.5	Figure C4.3.5.1 and C4.3.5.2	Same
2305.3.8.2.5	4.3.6.4.1.1	Same
2305.3.8.2.6	4.3.6.4.2.1	Same
2305.3.8.2.7	4.3.6.1.2	Same
2305.3.8.2.8	4.3.6.4.4	Same
2305.3.8.2.9	4.3.2.1	Same in substance except SDPWS clarifies calculation method for perforated shear wall deflection.
2305.3.9	4.3.3.2,	Same in substance except SDPWS clarifies criteria for both ASD and LRFD methods. SDPWS also clarifies criteria for combination of materials on opposite sides of a two-sided wall for seismic. Currently, IBC states that they should not be summed.

2305.3.10	4.3.6.3.1	SDPWS limits use of adhesive shear wall systems to SDC A, B, and C and specifies R=1.5. In IBC, a reduced R is not specified for a system with adhesive.
2305.3.11	4.3.6.4.3	Same intent which is to minimize sill plate or bottom plate splitting; however, SDPWS specifies a minimum 2-1/2" square by 1/4" washer for anchor bolts in all seismic design categories. To account for different bottom plate width and potential for cross-grain bending, SDPWS also requires the plate washer to extend to within 1/2" of the sheathed edge of the bottom plate. For SDC D, E and F only, IBC specifies 3x nominal sill plate with 3" square x 0.229" unless twice the number of anchor bolts are used. Where twice the number of anchor bolts are used, a 2x nominal sill plate is permitted provided the ASD design load is less than 600 plf.

Revision of Section 1613.6.1: The reference to Section 2305.2.5 of the IBC is replaced by reference to Section 4.2.5.2 of SDPWS containing the same limitations for cantilever diaphragms.

Revision of Table 2306.4.5 footnote a: The reference to Section 2305.1.5 of the IBC is replaced by reference to Section 4.1.5 of SDPWS containing the same limitations for wood members and systems resisting seismic forces contributed by masonry and concrete walls. The word "construction" is changed to "walls" to match language in both IBC and SDPWS.

Cost Impact: The cost change proposal will not increase the cost of construction. Provisions being deleted from Section 2305 of the IBC are contained in ANSI/AF&PA NDS Supplement "Special Design Provisions for Wind and Seismic" (SDPWS) which is currently adopted by reference.

Public Hearing Results

Committee Action:

Approved as Modified

Modify proposal as follows:

SECTION 2305 GENERAL DESIGN REQUIREMENTS FOR LATERAL-FORCE-RESISTING SYSTEMS

2305.1 General. Structures using wood shear walls and diaphragms to resist wind, seismic and other lateral loads shall be designed and constructed in accordance with AF&PA SDPWS and the provisions of Section 2305, 2306, and 2307.

2305.1.1 Openings in shear panels. Openings in shear panels that materially affect their strength shall be fully detailed on the plans, and shall have their edges adequately reinforced to transfer all shearing stresses.

2305.2 Diaphragm deflection. The deflection (Δ) of a blocked wood structural panel diaphragm uniformly fastened throughout with staples is permitted to be calculated by using the following equation. If not uniformly fastened, the constant 0.188 (For SI: 1/1627) in the third term ~~must~~ shall be modified accordingly.

$$\Delta = \frac{5vL^3}{8EAb} + \frac{vL}{4Gt} + 0.188Le_n + \frac{\Sigma(\Delta_c X)}{2b} \quad \text{(Equation 23-1)}$$

$$\Delta = \frac{.052vL^3}{EAb} + \frac{vL}{4Gt} + \frac{Le_n}{1627} + \frac{\Sigma(\Delta_c X)}{2b} \quad \text{(Equation 23-2)}$$

For SI:

Where:

- A = Area of chord cross section, in square inches (mm²).
- b = Diaphragm width, in feet (mm).
- E = Elastic modulus of chords, in pounds per square inch (N/mm²).
- e_n = Staple deformation, in inches (mm) [see Table ~~2305.2.2(1)~~ 2305.2(1)].
- Gt = Panel rigidity through the thickness, in pounds per inch (N/mm) of panel width or depth [see Table ~~2305.2.2(2)~~ 2305.2(2)].
- L = Diaphragm length, in feet (mm).
- v = Maximum shear due to design loads in the direction under consideration, in pounds per linear foot (plf) (N/mm).
- Δ = The calculated deflection, in inches (mm).
- $\Sigma(\Delta_c X)$ = Sum of individual chord-splice slip values on both sides of the diaphragm, each multiplied by its distance to the nearest support.

TABLE 2305.2(1)
e_n VALUES (inches) FOR USE IN CALCULATING DIAPHRAGM AND SHEAR WALL DEFLECTION
DUE TO FASTENER SLIP (Structural I)^{ac}

LOAD PER FASTENER ^b (pounds)	FASTENER DESIGNATIONS
	14-Ga staple x 2 inches long
60	0.011
80	0.018
100	0.028
120	0.04
140	0.053
160	0.068
180	-
200	-
220	-
240	-

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound = 4.448 N.

- a. Increase e_n values 20 percent for plywood grades other than Structural I.
- b. Load per fastener = maximum shear per foot divided by the number of fasteners per foot at interior panel edges.
- c. Decrease e_n values 50 percent for seasoned lumber (moisture content < 19 percent).

TABLE 2305.2(2)

VALUES OF Gt FOR USE IN CALCULATING DEFLECTION OF WOOD STRUCTURAL PANEL SHEAR WALLS AND DIAPHRAGMS
 (No change to table contents)

2305.3 Shear wall deflection. The deflection (Δ) of a blocked wood structural panel shear wall uniformly fastened throughout with staples is permitted to be calculated by the use of the following equation:

$$\Delta = \frac{8vh^3}{EAb} + \frac{vh}{Gt} + 0.75he_n + d_a \frac{h}{b} \quad \text{(Equation 23-2)}$$

$$\Delta = \frac{vh^3}{3EAb} + \frac{vh}{Gt} + \frac{he_n}{407.6} + d_a \frac{h}{b}$$

For SI:

Where:

- A = Area of boundary element cross section in square inches (mm²) (vertical member at shear wall boundary).
- b = Wall width, in feet (mm).
- d_a = Vertical elongation of overturning anchorage (including fastener slip, device elongation, anchor rod elongation, etc.) at the design shear load (v).
- E = Elastic modulus of boundary element (vertical member at shear wall boundary), in pounds per square inch (N/mm²).
- e_n = Staple deformation, in inches (mm) [see Table ~~2305.2.2(1)~~ 2305.2(1)].
- Gt = Panel rigidity through the thickness, in pounds per inch (N/mm) of panel width or depth [see Table ~~2305.2.2(2)~~ 2305.2(2)].
- h = Wall height, in feet (mm).
- v = Maximum shear due to design loads at the top of the wall, in pounds per linear foot (N/mm).
- Δ = The calculated deflection, in inches (mm).

1613.6.1 Assumption of flexible diaphragm. Add the following text at the end of Section 12.3.1.1 of ASCE 7: Diaphragms constructed of wood structural panels or untopped steel decking shall also be permitted to be idealized as flexible, provided all of the following conditions are met:

1. Toppings of concrete or similar materials are not placed over wood structural panel diaphragms except for nonstructural toppings no greater than 1 1/2 inches (38 mm) thick.
2. Each line of vertical elements of the lateral-force-resisting system complies with the allowable story drift of Table 12.12-1.
3. Vertical elements of the lateral-force-resisting system are light-framed walls sheathed with wood structural panels rated for shear resistance or steel sheets.
4. Portions of wood structural panel diaphragms that cantilever beyond the vertical elements of the lateral-force-resisting system are designed in accordance with Section 4.2.5.2 of AF & PA SDPWS.

TABLE 2306.4.5
ALLOWABLE SHEAR FOR WIND OR SEISMIC FORCES FOR SHEAR WALLS OF LATH AND PLASTER OR GYPSUM BOARD WOOD FRAMED WALL ASSEMBLIES

(No change to table contents)

- a. These shear walls shall not be used to resist loads imposed by masonry or concrete walls (see Section 4.1.5 of AF & PA SDPWS). Values shown are for short-term loading due to wind or seismic loading. Walls resisting seismic loads shall be subject to the limitations in Section 12.2.1 of ASCE 7. Values shown shall be reduced 25 percent for normal loading.

b. through k. (No change to current text)

Committee Reason: This proposal substitutes a referenced standard for the provisions of Section 2305. The modification helps achieve the intent of the code change to retain IBC provisions pertaining to staple fasteners.

Assembly Action:

None

Final Hearing Results

S82-06/07

AM

Code Change No: S83-06/07

Original Proposal

Section: 2306

Proponent: Jeffrey B. Stone, American Forest & Paper Association

Revise as follows:

**SECTION 2306
ALLOWABLE STRESS DESIGN**

2306.1 Allowable stress design. The structural analysis and construction of wood elements in structures using allowable stress design shall be in accordance with the following applicable standards:

American Forest & Paper Association.

NDS National Design Specification for Wood Construction
SDPWS Special Design Provisions for Wind and Seismic

American Institute of Timber Construction.

AITC 104 Typical Construction Details
AITC 110 Standard Appearance Grades for Structural Glued Laminated Timber
AITC 113 Standard for Dimensions of Structural Glued Laminated Timber
AITC 117 Standard Specifications for Structural Glued Laminated Timber of Softwood Species
AITC 119 Structural Standard Specifications for Glued Laminated Timber of Hardwood Species
AITC A190.1 Structural Glued Laminated Timber
AITC 200 Inspection Manual

American Society of Agricultural Engineers.

ASAE EP 484.2 Diaphragm Design of Metal -Clad, Post-Frame Rectangular Buildings
ASAE EP 486.1 Shallow Post Foundation Design
ASAE 559 Design Requirements and Bending Properties for Mechanically Laminated Columns

APA—The Engineered Wood Association.

Panel Design Specification
Plywood Design Specification Supplement 1 - Design & Fabrication of Plywood Curved Panel
Plywood Design Specification Supplement 2 - Design & Fabrication of Glued Plywood-Lumber Beams
Plywood Design Specification Supplement 3 - Design & Fabrication of Plywood Stressed-Skin Panels
Plywood Design Specification Supplement 4 - Design & Fabrication of Plywood Sandwich Panels
Plywood Design Specification Supplement 5 - Design & Fabrication of All-Plywood Beams
EWS T300 Glulam Connection Details
EWS S560 Field Notching and Drilling of Glued Laminated Timber Beams
EWS S475 Glued Laminated Beam Design Tables
EWS X450 Glulam in Residential Construction
EWS X440 Product and Application Guide: Glulam

EWS R540 Builders Tips: Proper Storage and Handling of Glulam Beams

Truss Plate Institute, Inc.

TPI 1 National Design Standard for Metal Plate Connected Wood Truss Construction

2306.1.1 Joists and rafters. The design of rafter spans is permitted to be in accordance with the *AF&PA Span Tables for Joists and Rafters*.

2306.1.2 Plank and beam flooring. The design of plank and beam flooring is permitted to be in accordance with the *AF&PA Wood Construction Data No. 4*.

2306.1.3 Treated wood stress adjustments. The allowable unit stresses for preservative-treated wood need no adjustment for treatment, but are subject to other adjustments. The allowable unit stresses for fire-retardant-treated wood, including fastener values, shall be developed from an approved method of investigation that considers the effects of anticipated temperature and humidity to which the fire-retardant-treated wood will be subjected, the type of treatment and the redrying process. Other adjustments are applicable except that the impact load duration shall not apply.

2306.1.4 Lumber decking. The capacity of lumber decking arranged according to the patterns described in Section 2304.8.2 shall be the lesser of the capacities determined for flexure and deflection according to the formulas in Table 2306.1.4.

**TABLE 2306.1.4
ALLOWABLE LOADS FOR LUMBER DECKING**

No change to table contents

~~2306.2 Wind provisions for walls.~~

~~2306.2.1 Wall stud bending stress increase.~~ The AF&PA NDS fiber stress in bending (F_b) design values for sawn lumber wood studs resisting out of plane wind loads shall be increased by the factors in Table 2306.2.1, in lieu of the 1.15 repetitive member factor. These increases take into consideration the load sharing and composite actions provided by the wood structural panels as defined in Section 2302.1. The increases shall apply where the studs are designed for bending and are spaced no more than 16 inches (406 mm) o.c., covered on the inside with a minimum of 1/2-inch (12.7 mm) gypsum board fastened in accordance with Table 2306.4.5 and sheathed on the exterior with a minimum of 3/8-inch (9.5mm) wood structural panel sheathing. All panel joints shall occur over studs or blocking and shall be attached using a minimum of 8d common nails spaced a maximum of 6 inches o.c. (152 mm) at panel edges and 12 inches o.c. (305mm) at intermediate framing members.

**~~TABLE 2306.2.1
WALL STUD BENDING STRESS INCREASE FACTORS~~**

2306. 3 Wood diaphragms.

2306. 3.1 Wood structural panel diaphragms. Wood structural panel diaphragms shall be designed and constructed in accordance with AF&PA SDPWS. Wood structural panel diaphragms are permitted to resist horizontal forces using the allowable shear capacities set forth in Table 2306.3.1 or Table 2306.3.2. The allowable shear capacities in Table 2306.3.1 and Table 2306.3.2 are permitted to be increased 40 percent for wind design, calculated by principles of mechanics without limitations by using values for fastener strength in the AF&PA NDS, structural design properties for wood structural panels based on DOC PS-1 and DOC PS-2 or wood structural panel design properties given in the *APA Panel Design Specification (PDS)*.

**TABLE 2306.3.1
RECOMMENDED SHEAR FOR WOOD STRUCTURAL PANEL DIAPHRAGMS WITH FRAMING OF DOUGLAS FIR LARCH OR SOUTHERN PINE FOR WIND AND SEISMIC LOADING.**

(No change to table contents)

**TABLE 2306.3.2
ALLOWABLE SHEAR IN POUNDS PER SUQRE FOOT FOR HORIZONTAL BLOCKED DIAPHRAGMS UTILIZING MULTIPLE ROWS OF FASTENERS WITH FRAMING OF DOUGLAS FIR LARCH OR SOUTHERN PINE FOR WIND OR SEISMIC LOADING.**

(No change to table contents)

~~2306.3.2 Shear capacities modifications.~~ The allowable shear capacities in Tables 2306.3.1 and 2306.3.2 for horizontal wood structural panel diaphragms shall be increased 40 percent for wind design.

~~2306.3.3 Diagonally sheathed lumber diaphragms.~~ Diagonally sheathed lumber diaphragms shall be nailed in accordance with Table 2306.3.3.

TABLE 2306.3.3

DIAGONALLY SHEATHED LUMBER DIAPHRAGM NAILING SCHEDULE

~~2306.3.4 Single diagonally sheathed lumber diaphragms.~~ Single diagonally sheathed lumber diaphragms shall be designed and constructed in accordance with AF&PA SDPWS. Single diagonally sheathed lumber diaphragms shall be constructed of minimum 1-inch (25 mm) thick nominal sheathing boards laid at an angle of approximately 45 degrees (0.78 rad) to the supports. The shear capacity for single diagonally sheathed lumber diaphragms of southern pine or Douglas fir-larch shall not exceed 300 plf (4378N/m) of width. The shear capacities shall be adjusted by reduction factors of 0.82 for framing members of species with a specific gravity equal to or greater than 0.42 but less than 0.49 and 0.65 for species with a specific gravity of less than 0.42, as contained in the AF&PA NDS.

~~2306.3.4.1 End joints.~~ End joints in adjacent boards shall be separated by at least one stud or joist space and there shall be at least two boards between joints on the same support.

~~2306.3.4.2 Single diagonally sheathed lumber diaphragms.~~ Single diagonally sheathed lumber diaphragms made up of 2-inch (51 mm) nominal diagonal lumber sheathing fastened with 16d nails shall be designed with the same shear capacities as shear panels using 1-inch (25 mm) boards fastened with 8d nails, provided there are not splices in adjacent boards on the same support and the supports are not less than 4 inch (102mm) nominal depth or 3 inch (76 mm) nominal thickness.

~~2306.3.5 Double diagonally sheathed lumber diaphragms.~~ Double diagonally sheathed lumber diaphragms shall be designed and constructed in accordance with AF&PA SDPWS. Double diagonally sheathed lumber diaphragms shall be constructed of two layers of diagonal sheathing boards at 90 degrees (1.57 rad) to each other on the same face of the supporting members. Each chord shall be considered as a beam with uniform load per foot equal to 50 percent of the unit shear due to diaphragm action. The load shall be assumed as acting normal to the chord in the plan of the diaphragm in either direction. The span of the chord or portion thereof shall be the distance between framing members of the diaphragm, such as the joists, studs and blocking that serve to transfer the assumed load to the sheathing. The shear capacity of double diagonally sheathed diaphragms of Southern pine or Douglas fir-larch shall not exceed 600 plf (8756 kN/m) of width. The shear capacity shall be adjusted by reduction factors of 0.82 for framing members of species with a specific gravity equal to or greater than 0.42 but less than 0.49 and 0.65 for species with a specific gravity of less than 0.42, as contained in the AF&PA NDS. Nailing of diagonally sheathed lumber diaphragms shall be in accordance with Table 2306.3.3.

~~2306.3.6 Gypsum board diaphragm ceilings.~~ Gypsum board diaphragm ceilings shall be in accordance with Section 2508.5.

~~2306.4 Shear walls.~~ Panel sheathing joints in shear walls shall occur over studs or blocking. Adjacent panel sheathing joints shall occur over and be nailed to common framing members (see Section 2305.3.1 for limitations on shear wall bracing materials).

~~2306.4.1 Wood structural panel shear walls.~~ Wood structural panel shear walls shall be designed and constructed in accordance with AF&PA SDPWS. Wood structural panel shear walls are permitted to resist horizontal forces using The the allowable shear capacities set forth in for wood structural panel shear walls shall be in accordance with Table 2306.4.1. These Allowable capacities in Table 2306.4.1 are permitted to be increased 40 percent for wind design. Shear walls are permitted to be calculated by principles of mechanics without limitations by using values for nail strength given in the AF&PA NDS and wood structural panel design properties given in the *APA Panel Design Specification*.

TABLE 2306.4.1

ALLOWABLE SHEAR (POUNDS PER FOOT) FOR WOOD STRUCTURAL PANEL SHEAR WALLS WITH FRAMING OF DOUGLAS FIR-LARCH OR SOUTHERN PINE FOR WIND OR SEISMIC LOADING

(No change to table contents)

~~2306.4.2 Lumber sheathed shear walls.~~ Single and double diagonally sheathed lumber diaphragms shear walls shall be designed and constructed in accordance with AF&PA SDPWS. are permitted using the construction and allowable load provisions of Sections 2306.3.4 and 2306.3.5. Single and double diagonally sheathed lumber walls shall not be used to resist seismic loads in structures in Seismic Design Category E or F.

2306.4.3 Particleboard shear walls. ~~Particleboard shear walls shall be designed and constructed in accordance with AF&PA SDPWS. Particleboard shear walls shall be permitted to resist horizontal forces using The design the allowable shear capacity of capacities particleboard shear walls shall be in accordance with set forth in Table 2306.4.3. Allowable capacities in Table 2306.4.3 are permitted to be increased 40 percent for wind design. Shear panels shall be constructed with particleboard sheets not less than 4 feet by 8 feet (1219 mm by 2438 mm), except at boundaries and changes in framing. Particleboard panels shall be designed to resist shear only, and chords, collector members and boundary elements shall be connected at all corners. Panel edges shall be backed with 2-inch (51 mm) nominal or wider framing. Sheets are permitted to be installed either horizontally or vertically. For 3/8-inch (9.5 mm) particleboard sheets installed with the long dimension parallel to the studs spaced 24 inches (610 mm) o.c., nails shall be spaced at 6 inches (152 mm) o.c. along intermediate framing members. For all other conditions, nails of the same size shall be spaced at 12 inches (305mm)o.c. along intermediate framing members. Particleboard panels less than 12 inches (305 mm) wide shall be blocked. Particleboard shall not be used to resist seismic forces in structures in Seismic Design Category D, E or F.~~

TABLE 2306.4.3
ALLOWABLE SHEAR FOR PARTICLEBOARD SHEAR WALL SHEATHING
 (No change to table contents)

2306.4.4 Fiberboard shear walls. ~~Fiberboard shear walls shall be designed and constructed in accordance with AF&PA SDPWS. Fiberboard shear walls are permitted to resist horizontal forces using The design the allowable shear capacity of capacities fiberboard shear walls shall be in accordance with set forth in Table 2306.4.4. Allowable capacities in Table 2306.4.4 are permitted to be increased 40 percent for wind design. The fiberboard sheathing shall be applied vertically or horizontally to wood studs not less than 2 inch (51 mm) in nominal thickness spaced 16 inches (406 mm) o.c. Blocking not less than 2 inch (51 mm) nominal in thickness shall be provided at horizontal joints. Fiberboard shall not be used to resist seismic forces in structures in Seismic Design Category D, E or F.~~

TABLE 2306.4.4
ALLOWABLE SHEAR VALUES (plf) FOR WIND OR SEISMIC LOADING ON VERTICAL DIAPHRAGMS OF FIBERBOARD SHEATHING BOARD CONSTRUCTION FOR TYPE V CONSTRUCTION ONLY
 (No change to table contents)

2306.4.5 Shear walls sheathed with other materials. ~~Shear walls sheathed with portland cement plaster, gypsum lath, gypsum sheathing, or gypsum board shall be designed and constructed in accordance with AF&PA SDPWS. Shear walls sheathed with these materials are permitted to resist horizontal forces using the allowable Shear shear capacities for walls sheathed with lath, plaster or gypsum board shall be in accordance with set forth in Table 2306.4.5. Shear walls sheathed with lath, plaster or gypsum board shall be constructed in accordance with Chapter 25 and Section 2306.4.5.1. Walls resisting seismic loads shall be subject to the limitations in Section 12.2.1 of ASCE 7. Shear walls sheathed with portland cement plaster, gypsum lath, gypsum sheathing, or gypsum board shall not be used to resist seismic loads in structures in Seismic Design Category E or F.~~

TABLE 2306.4.5
ALLOWABLE SHEAR FOR WIND OR SEISMIC FORCES FOR SHEAR WALLS OF LATH AND PLASTER OR GYPSUM BOARD WOOD FRAMED WALL ASSEMBLIES
 (No change to table contents)

2306.4.5.1 Application of gypsum board or lath and plaster to wood framing.

2306.4.5.1.1 Joint staggering. ~~End joints of adjacent courses of gypsum board shall not occur over the same stud.~~

2306.4.5.1.2 Blocking. ~~Where required in Table 2306.4.5, wood blocking having the same cross-sectional dimensions as the studs shall be provided at joints that are perpendicular to the studs.~~

2306.4.5.1.3 Fastening. ~~Studs, top and bottom plates and blocking shall be fastened in accordance with Table 2304.9.1.~~

2306.4.5.1.4 Fasteners. ~~The size and spacing of fasteners shall be set forth in Table 2306.4.5. Fasteners shall be spaced not less than 3/8 inch (9.5 mm) from edges and ends of gypsum boards or sides of studs, blocking and top and bottom plates.~~

2306.4.5.1.5 Gypsum lath. ~~Gypsum lath shall be applied perpendicular to the studs. Maximum allowable shear values shall be as set forth in Table 2306.4.5.~~

~~**2306.4.5.1.6 Gypsum sheathing.** Four foot wide (1219 mm) pieces of gypsum sheathing shall be applied parallel or perpendicular to studs. Two-foot wide (610 mm) pieces of gypsum sheathing shall be applied perpendicular to the studs. Maximum allowable shear values shall be as set forth in Table 2306.4.5.~~

~~**2306.4.5.1.7 Other gypsum boards.** Gypsum board shall be applied parallel or perpendicular to studs. Maximum allowable shear values shall be as set forth in Table 2306.4.5.~~

Reason: Provisions being deleted from Section 2306 of the IBC are also contained in the AF&PA *Special Design Provisions for Wind and Seismic* (AF&PA SDPWS) which is currently adopted by reference. Deleted provisions are primarily for the building designer and duplication of the provisions is not necessary and causes confusion. However; this proposed change retains tabulated values of ASD unit shear capacity for shear walls and diaphragms as the building code has been the primary source of this information for many years. ASD unit shear capacities for shear walls and diaphragms can also be obtained directly from the SDPWS-05. Over time, it is desired that all the design provisions, including tabulated ASD unit shear capacities, be obtained by reference to the SDPWS. Provisions of the IBC Section 2306 are covered in SDPWS-05 as shown in Table 2306.

Table 2306. Comparison of IBC Section 2306 and SDPWS-05

IBC Section 2306	SDPWS-05	Comment
2306.2.1	3.1.1.1	Same
Table 2306.2.1	Table 3.1.1.1	Same
2306.3.1	4.1.2	Same
2306.3.2	Table 4.2A-C	Same except increase for wind is incorporated in SDPWS design value tables.
2306.3.3	4.2.7.2, 4.2.7.3	Same
2306.3.4	4.2.7.2	Same except 40% increase is recognized for wind design consistent with SDPWS.
2306.3.4.1	4.2.7.2	Same
2306.3.4.2	4.2.7.2	Same
2306.3.5	4.2.7.3	Same except 40% increase is recognized for wind design consistent with SDPWS.
2306.4	4.3.7	Same
2306.4.1	4.1.2	Same
2306.4.3	4.3.7.2	Same except 40% increase is recognized for wind design consistent with SDPWS.
2306.4.4	4.3.7.3	Same except 40% increase ins recognized for wind design consistent with SDPWS.
2306.4.5.1	4.3.7.4	Same
2306.4.5.1.1	4.3.7.4	Same
2306.4.5.1.2	4.3.7.4	Same
2306.4.5.1.3	4.3.7.4	Same
2306.4.5.1.4	4.3.7.4	Same
2306.4.5.1.5	4.3.7.4.3	Same
2306.4.5.1.6	4.3.7.4.2	Same
2306.4.5.1.7	4.3.7.4	Same

With removal of duplicate information, it is suggested that remaining sections be numbered as follows:

SECTION 2306

ALLOWABLE STRESS DESIGN

2306.1 Allowable stress design.

2306.1.1 Joists and rafters.

2306.1.2 Plank and beam flooring.

2306.1.3 Treated wood stress adjustments.

2306.1.4 Lumber decking.

2306.2 Wood diaphragms.

2306.2.1 Wood structural panel diaphragms.

2306.2.2 Single diagonally sheathed lumber diaphragms.

2306.2.3 Double diagonally sheathed lumber diaphragms.

2306.2.4 Gypsum board diaphragm ceilings.

2306.3 Shear walls.

2306.3.1 Wood structural panel shear walls.

2306.3.2 Lumber sheathed shear walls.

2306.3.3 Particleboard shear walls.

2306.3.4 Fiberboard shear walls.

2306.3.5 Shear walls sheathed with other materials.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: Relying on a referenced standard for the technical provisions for allowable stress design of wood is consistent with the action taken on S82-06/07.

Assembly Action:

None

Final Hearing Results

S83-06/07

AS

Code Change No: **S90-06/07**

Original Proposal

Sections: 2305.3.11, 2308.6, 2308.12.8, 2308.12.9; IRC 403.1.6.1, R602.11.1

Proponent: Randall Shackelford, Simpson Strong-Tie Co.

PART I – IBC STRUCTURAL

Revise as follows:

2305.3.11 Sill plate size and anchorage in Seismic Design Category D, E or F. Shear wall sill plates shall be anchored with a Anchor bolts for shear walls shall include with steel plate washers, between the sill plate and nut or with approved anchor straps load rated in accordance with section 1715.1 and spaced to provide equivalent anchorage. Steel plate washers shall be a minimum of 0.229 inch by 3 inches by 3 inches (5.82 mm by 76 mm by 76 mm) in size, between the sill plate and nut. The hole in the plate washer is permitted to be diagonally slotted with a width of up to 3/16 inch (4.76 mm) larger than the bolt diameter and a slot length not to exceed 13/4 inches (44 mm), provided a standard cut washer is placed between the plate washer and the nut. Sill plates resisting a design load greater than 490 plf (7154 N/m) using load and resistance factor design or 350 plf (5110 N/m) using allowable stress design shall not be less than a 3-inch (76 mm) nominal member. Where a single 3- inch (76 mm) nominal sill plate is used, 2- 20d box end nails shall be substituted for 2-16d common end nails found in line 8 of Table 2304.9.1.

Exception: In shear walls where the design load is greater than 490 plf (7151 N/m) but less than 840 plf (12 264 N/m) using load and resistance factor design or greater than 350 plf (5110 N/m) but less than 600 plf (8760 N/m) using allowable stress design, the sill plate is permitted to be a 2-inch (51 mm) nominal member if the sill plate is anchored by two times the number of bolts or anchor straps required by design and 0.229-inch by 3-inch by 3-inch (5.82mmby 76mmby 76mm) plate washers are used.

2308.6 Foundation plates or sills. Foundations and footings shall be as specified in Chapter 18. Foundation plates or sills resting on concrete or masonry foundations shall comply with Section 2304.3.1. Foundation plates or sills shall be bolted or anchored to the foundation with not less than 1/2-inch-diameter (12.7 mm) steel bolts or approved anchors spaced to provide equivalent anchorage as the steel bolts. Bolts shall be embedded at least 7 inches (178 mm) into concrete or masonry, and spaced not more than 6 feet (1829 mm) apart. There shall be a minimum of two bolts or anchor straps per piece with one bolt or anchor strap located not more than 12 inches (305 mm) or less than 4 inches (102 mm) from each end of each piece. A properly sized nut and washer shall be tightened on each bolt to the plate.

2308.12.8 Steel plate washers Sill plate anchorage. Sill plates shall be anchored with anchor bolts with steel plate washers shall be placed between the foundation sill plate and the nut, or approved anchor straps load rated in accordance with Section 1715.1. Such washers shall be a minimum of 0.229 inch by 3 inches by 3 inches (5.82 mm by 76 mm by 76 mm) in size. The hole in the plate washer is permitted to be diagonally slotted with a width of up to 3/16 inch (4.76 mm) larger than the bolt diameter and a slot length not to exceed 1 3/4 inches (44 mm), provided a standard cut washer is placed between the plate washer and the nut.

2308.12.9 Sill plate anchorage in Seismic Design Category E. Steel bolts with a minimum nominal diameter of 5/8 inch (15.9 mm) or approved foundation anchor straps load rated in accordance with Section 1715.1 and spaced to provide equivalent anchorage shall be used in Seismic Design Category E.

PART II – IRC**Revise as follows:**

R403.1.6.1 Foundation anchorage in Seismic Design Categories C, D₀, D₁ and D₂. In addition to the requirements of Section R403.1.6, the following requirements shall apply to wood light-frame structures in Seismic Design Categories D₀, D₁ and D₂ and wood light-frame townhouses in Seismic Design Category C.

1. Plate washers conforming to Section R602.11.1 shall be provided for all anchor bolts over the full length of required braced wall lines except where approved anchor straps are used. Properly sized cut washers shall be permitted for anchor bolts in wall lines not containing braced wall panels.
2. Interior braced wall plates shall have anchor bolts spaced at not more than 6 feet (1829 mm) on center and located within 12 inches (305 mm) of the ends of each plate section when supported on a continuous foundation.
3. Interior bearing wall sole plates shall have anchor bolts spaced at not more than 6 feet (1829 mm) on center and located within 12 inches (305 mm) of the ends of each plate section when supported on a continuous foundation.
4. The maximum anchor bolt spacing shall be 4 feet (1219 mm) for buildings over two stories in height.
5. Stepped cripple walls shall conform to Section R602.11.3.
6. Where continuous wood foundations in accordance with Section R404.2 are used, the force transfer shall have a capacity equal to or greater than the connections required by Section R602.11.1 or the braced wall panel shall be connected to the wood foundations in accordance with the braced wall panel-to-floor fastening requirements of Table R602.3(1).

R602.11.1 Wall anchorage. Braced wall line sills shall be anchored to concrete or masonry foundations in accordance with Sections R403.1.6 and R602.11. For all buildings in Seismic Design Categories D₀, D₁ and D₂ and townhouses in Seismic Design Category C, plate washers, a minimum of 0.229 inch by 3 inches by 3 inches (5.8mm by 76mm by 76 mm) in size, shall be installed between the foundation sill plate and the nut, except where approved anchor straps are used. The hole in the plate washer is permitted to be diagonally slotted with a width of up to 3/16 inch (5 mm) larger than the bolt diameter and a slot length not to exceed 1 3/4 inches (44 mm), provided a standard cut washer is placed between the plate washer and the nut.

Reason: (IBC) Revise the code to allow strap anchors in higher seismic regions, or clarify code that strap anchors are permitted in higher seismic regions, depending on how you look at it.

Recent cyclic testing of foundation anchor straps on long and short walls by Simpson Strong-Tie has shown that they perform very well under cyclic loading. This is partly because they wrap around the sill plate at the sheathing nailing location, thereby helping to prevent cross-grain bending of the sill plate. Since prevention of cross-grain bending is the primary reason for using plate washers, anchor straps can be substituted for anchor bolts with plate washers. However, most anchor straps are not a one-for-one substitution for anchor bolts, so it is necessary to add the wording "spaced as required to provide equivalent anchorage". For shear walls, the designer will determine the required spacing based on the tested allowable load of the strap anchor. For conventional construction, builders can refer to manufacturer's literature for equivalent spacing to anchor bolts.

(IRC) Some building officials have interpreted this section as prohibiting the use of anchor straps to anchor sill plates when the 3 by 3 washer is required. Recent cyclic testing of foundation anchor straps on long and short shear walls by Simpson Strong-Tie has shown that they perform very well under cyclic loading. This is partly because they wrap around the sill plate at the sheathing nailing location, thereby helping to prevent cross-grain bending of the sill plate. Since prevention of cross-grain bending is the primary reason for using plate washers, anchor straps can be substituted for anchor bolts with plate washers. Although it is true that most anchor straps are not a one-for-one substitution for anchor bolts, the IRC already contains the wording "spaced as required to provide equivalent anchorage to 1/2-inch diameter anchor bolts" in Section R403.1.6. Builders and building officials can refer to manufacturer's literature for equivalent spacing to anchor bolts. This change limits the permission to "anchor straps" because that is what has been tested.

Cost Impact: The code change proposal will not increase the cost of construction. It will allow additional options.

Public Hearing Results

Committee Action:**Approved as Modified****Modify proposal as follows:**

2305.3.11 Sill plate size and anchorage in Seismic Design Category D, E or F. Shear wall sill plates shall be anchored with anchor bolts with steel plate washers, between the sill plate and nut or with approved anchor straps load rated in accordance with section 1715.1 and spaced to provide equivalent anchorage. Steel plate washers shall be a minimum of 0.229 inch by 3 inches by 3 inches (5.82 mm by 76 mm by 76 mm) in size. The hole in the plate washer is permitted to be diagonally slotted with a width of up to 3/16 inch (4.76 mm) larger than the bolt diameter and a slot length not to exceed 1 3/4 inches (44 mm), provided a standard cut washer is placed between the plate washer and the nut. Sill plates resisting a design load greater than 490 plf (7154 N/m) using load and resistance factor design or 350 plf (5140 N/m) using allowable stress design shall not be less than a 3-inch (76 mm) nominal member. Where a single 3-inch (76 mm) nominal sill plate is used, 2-20d box end nails shall be substituted for 2-16d common end nails found in line 8 of Table 2304.9.1.

Exception: In shear walls where the design load is greater than 490 plf (7151 N/m) but less than 840 plf (12 264 N/m) using load and resistance factor design or greater than 350 plf (5110 N/m) but less than 600 plf (8760 N/m) using allowable stress design, the sill plate is permitted to be a 2-inch (51 mm) nominal member if the sill plate is anchored by two times the number of bolts or anchor straps required by design and 0.229-inch by 3-inch by 3-inch (5.82mm by 76mm by 76mm) plate washers are used.

2308.6 Foundation plates or sills. Foundations and footings shall be as specified in Chapter 18. Foundation plates or sills resting on concrete or masonry foundations shall comply with Section 2304.3.1. Foundation plates or sills shall be bolted or anchored to the foundation with not less than 1/2-inch-diameter (12.7 mm) steel bolts or approved anchors spaced to provide equivalent anchorage as the steel bolts. Bolts shall be embedded at least 7 inches (178 mm) into concrete or masonry, and spaced not more than 6 feet (1829 mm) apart. There shall be a minimum of two bolts or anchor straps per piece with one bolt or anchor strap located not more than 12 inches (305 mm) or less than 4 inches (102 mm) from each end of each piece. A properly sized nut and washer shall be tightened on each bolt to the plate.

2308.12.8 Sill plate anchorage. Sill plates shall be anchored with anchor bolts with steel plate washers between the foundation sill plate and the nut, or approved anchor straps load rated in accordance with Section 1715.1. Such washers shall be a minimum of 0.229 inch by 3 inches by 3 inches (5.82 mm by 76 mm by 76 mm) in size. The hole in the plate washer is permitted to be diagonally slotted with a width of up to 3/16 inch (4.76 mm) larger than the bolt diameter and a slot length not to exceed 1 3/4 inches (44 mm), provided a standard cut washer is placed between the plate washer and the nut.

2308.12.9 Sill plate anchorage in Seismic Design Category E. Steel bolts with a minimum nominal diameter of e inch (15.9 mm) or approved foundation anchor straps load rated in accordance with Section 1715.1 and spaced to provide equivalent anchorage shall be used in Seismic Design Category E.

Committee Reason: The code change allows the use of anchor straps as an alternative for foundation anchorage. The modification is for consistency with the action taken on S82-06/07.

Assembly Action: **None**

PART II — IRC

Committee Action: **Approved as Submitted**

Committee Reason: This change, allowing the use of anchor straps, provides a technique that adds versatility to the code.

Assembly Action: **None**

Final Hearing Results

S90-06/07, Part I	AM
S90-06/07, Part II	AS

Code Change No: S95-06/07

Original Proposal

Table 2306.3.1, Table 2306.4.1

Proponent: Edwin T. Huston, Smith & Huston Inc., representing National Council of Structural Engineering Associations

Revise as follows:

**TABLE 2306.3.1
ALLOWABLE SHEAR (POUNDS PER FOOT) FOR WOOD STRUCTURAL PANEL DIAPHRAGMS WITH
FRAMING OF DOUGLAS-FIR-LARCH, OR SOUTHERN PINE ^a FOR WIND OR SEISMIC LOADING ^h**

- c. Framing at adjoining panel edges shall be 3 inches nominal or wider, and nails shall be staggered where ~~nails are spaced~~ panel edge nailing is specified at 2-inches o.c. or 2-1/2 inches o.c. or less.
- d. Framing at adjoining panel edges shall be 3 inches nominal or wider, and nails shall be staggered where both of the following conditions are met: (1) 10d nails having penetration into framing of more than 1-1/2 inches and (2) ~~nails are spaced~~ panel edge nailing is specified at 3 inches o.c. or less.

(Portions of table and footnotes not shown remain unchanged)

TABLE 2306.4.1
ALLOWABLE SHEAR (POUNDS PER FOOT) FOR WOOD STRUCTURAL PANEL SHEAR WALLS WITH
FRAMING OF DOUGLAS-FIR-LARCH, OR SOUTHERN PINE ^a FOR WIND OR SEISMIC LOADING ^{b, h, i, j, l}

- e. Framing at adjoining panel edges shall be 3 inches nominal or wider, and nails shall be staggered where ~~nails are spaced~~ panel edge nailing is specified at 2 inches on center or less.
- f. Framing at adjoining panel edges shall be 3 inches nominal or wider, and nails shall be staggered where both of the following conditions are met: (1) 10d (3" x 0.148") nails having penetration into framing of more than 1-1/2 inches and (2) ~~nails are spaced~~ panel edge nailing is specified at 3 inches on center or less.

(Portions of table and footnotes not shown remain unchanged)

Reason: Substitute revised material for current provision of the Code.

The purpose of the proposal is to establish technically sound language in the footnotes that require the staggering of nails based on their spacing. The allowable shear values in Tables 2306.3.1 and 2306.4.1 are based on specified spacing of panel edge nailing. The in-place spacing, however, can vary substantially. The requirements for staggering are intended to be based on the specified spacing from which allowable shear values are determined. The current language in the footnotes, however, implies that the requirements are based on the in-place spacing. The proposed revisions will establish that the requirements are based on the specified spacing.

The term "or less" is added to Footnotes (e) and (f) of Table 2306.4.1 for consistency with Footnote (d) of Table 2306.3.1. It is also done to eliminate the possibility of specifying, for example, panel edge nailing at 1.9 inches o.c. to avoid the requirements in Footnote (e) of Table 2306.4.1 for 3-inch nominal framing members and staggered nailing. Footnote (c) of Table 2306.3.1 is revised for a similar reason: eliminate the possibility of specifying panel edge nailing at 2.4 or 1.9 inches o.c. to avoid the requirements for 3-inch nominal framing members and staggered nailing.

Cost Impact: The code change proposal will not increase the cost of construction

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: This proposal was disapproved based on the approval of code change S83-06/07.

Assembly Action:

None

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Edwin T. Huston, P.E., S.E., Smith & Huston, Inc., Consulting Engineers, representing National Council of Structural Engineering Associations, Code Advisory Committee, requests Approval as Submitted.

Commenter's Reason: At the Orlando hearings, disapproval of Proposal S95 was requested due to committee action on Proposals S82 and S83, which were for approval as amended and approval as submitted, respectively. Proposals S82 and S83, however, do not delete Tables 2306.3.1 and 2306.4.1. Consequently, the proposed revisions to Tables 2306.3.1 and 2306.4.1 in Proposal S95 remain valid.

Final Hearing Results

S95-06/07

AS

Code Change No: **S97-06/07**

Original Proposal

Table 2306.3.1, Table 2306.4.1, 2307.1.1

Proponent: Edwin T. Huston, Smith & Huston, Inc., representing National Council of Structural Engineering Associations

Revise as follows:

TABLE 2306.3.1

ALLOWABLE SHEAR (POUNDS PER FOOT) FOR WOOD STRUCTURAL PANEL DIAPHRAGMS WITH FRAMING OF DOUGLAS-FIR-LARCH, OR SOUTHERN PINE^a FOR WIND OR SEISMIC LOADING^h

- c. Framing at adjoining panel edges shall be 3 inches nominal or wider, and nails at all panel edges shall be staggered where nails are spaced 2 inches o.c. or 2-1/2 inches o.c.
- d. Framing at adjoining panel edges shall be 3 inches nominal or wider, and nails at all panel edges shall be staggered where both of the following conditions are met: (1) 10d nails having penetration into framing of more than 1-1/2 inches and (2) nails are spaced 3 inches o.c. or less.

(Portions of table and footnotes not shown remain unchanged)

TABLE 2306.4.1

ALLOWABLE SHEAR (POUNDS PER FOOT) FOR WOOD STRUCTURAL PANEL SHEAR WALLS WITH FRAMING OF DOUGLAS-FIR-LARCH, OR SOUTHERN PINE^a FOR WIND OR SEISMIC LOADING^{b, h, i, j, l}

- e. Framing at adjoining panel edges shall be 3 inches nominal or wider, and nails at all panel edges shall be staggered where nails are spaced 2 inches on center.
- f. Framing at adjoining panel edges shall be 3 inches nominal or wider, and nails at all panel edges shall be staggered where both of the following conditions are met: (1) 10d (3" x 0.148") nails having penetration into framing of more than 1-1/2 inches and (2) nails are spaced 3 inches on center.
- h. Where panels are applied on both faces of a wall and nail spacing is less than 6 inches o.c. on either side, panel joints shall be offset to fall on different framing members. Or framing shall be 3-inch nominal or thicker at adjoining panel edges and nails ~~on each side~~ at all panel edges shall be staggered.
- i. In Seismic Design Category D, E or F, where shear design values exceed 350 pounds per lineal foot, all framing members receiving edge nailing from abutting panels shall not be less than a single 3-inch nominal member, or two 2-inch nominal members fastened together in accordance with Section 2306.1 to transfer the design shear value between framing members. Wood structural panel joint and sill plate nailing shall be staggered ~~in all cases~~ at all panel edges. See Section 2305.3.11 for sill plate size and anchorage requirements.

(Portions of table and footnotes not shown remain unchanged)

2307.1.1 Wood structural panel shear walls. In Seismic Design Category D, E or F, where shear design values exceed 490 pounds per foot (7154 N/m), all framing members receiving edge nailing from abutting panels shall not be less than a single 3-inch (76 mm) nominal member or two 2-inch (51 mm) nominal members fastened together in accordance with AF&PA NDS to transfer the design shear value between framing members. Wood structural panel joint and sill plate nailing shall be staggered ~~in all cases~~ at all panel edges. See Section 2305.3.11 for sill plate size and anchorage requirements.

Reason: Substitute revised material for current provision of the code. There is confusion among designers, code officials and contractors concerning application of the requirement for staggering of nails at the panel edges of wood structural panel sheathing. The intent is to stagger the nails transversely and longitudinally along each panel edge at a recommended spacing of 3/8 to 1/2 inch, thus creating two lines of resistance along each panel edge. The confusion comes from the mistaken assumption that the staggering can occur transversely back and forth at the edges of abutting panels, rather than along each panel edge. The proposed revisions will clarify that the staggering of the nails is required at each panel edge.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: This proposal was disapproved based on the approval of code change S83-06/07.

Assembly Action:

None

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Edwin T Huston, P.E., S.E., Smith & Huston, Inc., Consulting Engineers, representing National Council of Structural Engineering Associations, Code Advisory Committee, requests Approval as Submitted.

Commenter's Reason: At the Orlando hearings, disapproval of Proposal S97 was requested due to committee action on Proposals S82 and S83, which were for approval as amended and approval as submitted, respectively. Proposals S82 and S83, however, do not delete Tables 2306.3.1 and 2306.4.1 and Section 2307.1.1. Consequently, the proposed revisions to Tables 2306.3.1 and 2306.4.1 and Section 2307.1.1 in Proposal S97 remain valid.

Final Hearing Results

S97-06/07

AS

Code Change No: S98-06/07

Original Proposal

Table 2306.4.5

Proponent: Ben L. Schmid, Consulting Structural Engineer

Revise as follows:

**TABLE 2306.4.5
ALLOWABLE SHEAR FOR WIND OR SEISMIC FORCES FOR SHEAR WALLS OF LATH
AND PLASTER OR GYPSUM BOARD WOOD FRAMED WALL ASSEMBLIES**

TYPE OF MATERIAL	THICKNESS OF MATERIAL	WALL CONSTRUCTION	FASTENER SPACING ^b MAXIMUM (inches)	SHEAR VALUE ^{a, e} (plf)	MINIMUM FASTNER SIZE ^{c, d, j, k}
Gypsum lath, plain or perforated	3/8" lath and 1/2" plaster	Unblocked	5	400 <u>180</u>	No. 13 gage, 1 1/8" long, 19/64" head, plasterboard nail 16 Ga. Galv. Staple, 1 1/4" long 0.120" Nail, min 3/8" head, 1 1/4" long

(Portions of table not shown do not change)

Reason: The purpose of this proposal is to revise the outdated Shear Value for 3/8" gypsum lath and 1/2" plaster from 100 (plf) to 180 (plf).

All the sheathing material listed in Table 2306.4.5 with shear values for Seismic Force-Resisting Systems are contained in ASCE 7-05 Table 12.2.1 Bearing Wall Systems A.14-Light-framed walls with shear panels of all other materials, resulting with a Response Modification Coefficient, R of 2 (Limited Ductility).

CODE CHANGES RESOURCE COLLECTION – INTERNATIONAL BUILDING CODE

The current code shear value for 3/8" Gypsum lath and 1/2" plaster is greatly undervalued and has been for over 50 years. Comparison is made of 1/2" thick Gypsum board, unblocked, with nails at 4 inches on center with a shear value of 125 (plf), listed as Item 4 Table 2306.4.5 with Item 2: 7/8" thick Gypsum lath and plaster, with similar nails at 5 inches on center. In an 8 foot by 8 foot panel, there would be 180 nails in the 1/2" thick Gypsum board versus 260 similar nails in the 7/8" thick Gypsum lath and plaster.

Factoring 260 nails x 0.375" nail bearing x 0.875" gypsum thickness x 125 (plf) for 1/2" Gypsum
180 0.50" 0.50"

board results in 236 (plf) for 7/8" thick Gypsum lath and plaster.

As an accredited expert on wood frame structures, the Author has observed and reported on damage to such sheathed wood framed structures in the past 9 earthquakes in California. The 1971 San Francisco and 1994 Northridge Earthquakes provided comparison of damage to one and two story residences sheathed with stucco exterior walls and 1/2" Gypsum board versus 7/8" Gypsum lath and plaster on interior walls due to each earthquake. In each geographic area with equal Modified Mercalli (MMI) shaking of between 7 and 9 intensity, the 1/2" Gypsum board sheathed residences has extensive and severe damage as compared to 7/8" lath and plaster. Combined with the required Cornerite 2" x 2" expanded metal reinforcing at each intersecting wall and ceiling, each room becomes a box and supports its tributary lateral loading including walls, ceilings or floor joists and roof area due to the continuity furnished by 7/8" lath and plaster.

Immediately after the 1994 Northridge Earthquake, the City and County of Los Angeles funded cyclic load testing of plywood, stucco and Gypsum board sheathing at the Civil Engineering Laboratory at the University of California an Irvine. The tests verified that the Allowable Stress Design values should have been reduced 50 per cent per note 1 in Table 25-I in the 1994 UBC.

The Board of Directors of the Structural Engineers Association of Southern California authorized and funded cyclic testing, using the testing protocol developed for the sheathing testing at UC Irvine, for 7/8" Gypsum lath and plaster. The three 8 foot by 8 foot tested panels developed an average of 205 (plf). The testing was done at the Specialized Testing Laboratory, ICC-ES certified. Ben Schmid, S.E. and Ted Christensen, S.E. continuously observed the tests. The test allowed the conclusion that the existing Shear Value shown in Table 2306.4.5 is overly restrictive.

Data for cyclic tests and resulting Load/Deflection curves are submitted for 7/8" thick Gypsum lath and plaster, 1/2" and 5/8" Gypsum Board. Allowable Stress Design (ASD) values are developed from the curve data at effective Strength Limit State multiplied by 0.65 for Load and Resistance Factor Design (LRFD), then divided by 1.4 for ASD.

Bibliography:

1. Gypsum Board tests number 7 and 8 reported in Final Report of a Testing Program of Light-framed Walls with Wood Sheathed Shear Panels by the Structural Engineers Association of Southern California and Department of Civil and Environmental Engineering, University of California, Irvine, dated December, 2001. Research Award Number "FEMA-DR-1008-8011."

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Modified

Modify proposal as follows:

**TABLE 2306.4.5
ALLOWABLE SHEAR FOR WIND OR SEISMIC FORCES FOR SHEAR WALLS OF LATH AND PLASTER
OR GYPSUM BOARD WOOD FRAMED WALL ASSEMBLIES**

TYPE OF MATERIAL	THICKNESS OF MATERIAL	WALL CONSTRUCTION	FASTENER SPACING ^b MAXIMUM (inches)	SHEAR VALUE ^a , e (plf)	MINIMUM FASTENER SIZE ^{c,d,j,k}
2. Gypsum lath, plain or perforated with vertical joints staggered	d" lath and 1/2" plaster	Unblocked	5	180	No. 13 gage, 1c" long, 19/64" head, plasterboard nail 0.120" Nail, min d" head, 1 1/4" long
3. Gypsum lath, plain or perforated	d" lath and 1/2" plaster	Unblocked	5	100	16 Ga. Galv. Staple, 1 c" long 0.120" Nail, min d" head, 1 1/4" long

(Portions of table not shown remain unchanged)

Committee Reason: The proposal adds a valuable option for shear wall buildings. The proponent provided adequate testing and verification for increasing the allowable shear. The modification clarifies that the vertical joints must be staggered since that is what was tested in justifying the higher shear values. In addition the modification retains the current allowable shear values since these would still be permissible if joints are not staggered.

Assembly Action:

None

Final Hearing Results

S98-06/07

AM

Code Change No: S99-06/07

Original Proposal

Section: 2307.1

Proponent: Jeffrey B. Stone, American Forest & Paper Association

Revise as follows:

2307.1 Load and resistance factor design. The structural analysis and construction of wood elements and structures using load and resistance factor design shall be in accordance with AF&PA NDS and AF&PA SDPWS.

Reason: Adds reference to the AF&PA Special Design Provisions for Wind and Seismic (SDPWS) to Section 2307 pertaining to load and resistance factor design (LRFD) for wood elements and structures. The AF&PA SDPWS is currently adopted by reference.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: This change adds a cross-reference to the standard that was adopted for lateral design by S82-06/07.

Assembly Action:

None

Final Hearing Results

S99-06/07

AS

Code Change No: S100-06/07

Original Proposal

Sections: 2308.2; IRC R301.3

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL AND THE IRC BUILDING/ENERGY CODE DEVELOPMENT COMMITTEES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

Proponent: Kirk Grundahl, Wood Truss Council of America, representing the Structural Building Components Industry

PART I – IBC

Revise as follows:

2308.2 Limitations. Buildings are permitted to be constructed in accordance with the provisions of conventional light-frame construction, subject to the following limitations, and to further limitations of Sections 2308.11 and 2308.12.

1. Buildings shall be limited to a maximum of three stories above grade plane. For the purposes of this section, for buildings in Seismic Design Category D or E as determined in Section 1613, cripple stud walls shall be considered to be a story.

Exception: Solid blocked cripple walls not exceeding 14 inches (356 mm) in height need not be considered a story.

2. Bearing wall ~~floor-to-floor heights~~ story height shall not exceed a stud height of 10 feet (3048 mm) plus a height of floor framing not to exceed 16 inches (406 mm). Floor framing height shall be permitted to exceed this limit provided the story height limit is not exceeded.

(No changes to items 3 through 7)

PART II – IRC

Revise as follows:

R301.3 Story height. Buildings constructed in accordance with these provisions shall be limited to story heights of not more than the following:

1. For wood wall framing, the laterally unsupported bearing wall stud height permitted by Table R602.3(5) plus a height of floor framing not to exceed 16 inches.

Exception: For wood framed wall buildings with bracing in accordance with Table R602.10.1, the wall stud clear height used to determine the maximum permitted story height may be increased to 12 feet without requiring an engineered design for the building wind and seismic force resisting systems provided that the length of bracing required by Table R602.10.1 is increased by multiplying by a factor of 1.20. Wall studs are still subject to the requirements of this section.

2. For steel wall framing, a stud height of 10 feet, plus a height of floor framing not to exceed 16 inches.
3. For masonry walls, a maximum bearing wall clear height of 12 feet plus a height of floor framing not to exceed 16 inches.

Exception: An additional 8 feet is permitted for gable end walls.

4. For insulating concrete form walls, the maximum bearing wall height per story as permitted by Section 611 tables plus a height of floor framing not to exceed 16 inches.

Individual walls or walls studs shall be permitted to exceed these limits as permitted by Chapter 6 provisions, provided story heights are not exceeded. Floor framing height shall be permitted to exceed these limits provided the story height limit is not exceeded An engineered design shall be provided for the wall or wall framing members when they exceed the limits of Chapter 6. Where the story height limits are exceeded, an engineered design shall be provided in accordance with the International Building Code for the overall wind and seismic force resisting systems.

Reason: (IBC) The purpose of this proposed code change is to clarify the code language regarding story height limitations and how stud height limitations and floor framing limitations are to be interpreted.

The current story height requirements were introduced in the 2003 code cycle into the IRC by BCCS (RB39-02). The final proposal was extensively modified from the original proposal which dealt only with the stud height issue. The committee reason for accepting RB39-02 as modified was given as follows:

Committee Reason: Based on proponent's published reason. This code change has been modified from that originally submitted to the ICC in order to coordinate with the material limits currently contained in (and, in the case of wood, currently being added to) the IRC. The exception to Item 1 has been added at the request of other interested parties to accommodate the high ceilings that are currently common in some parts of the country.

No technical supporting documentation was provided on the 16 inch limitation on floor framing. Our assumption is that the intent of the code modification was to arrive at a maximum story height by setting a maximum floor framing depth to be used with a maximum stud height. However, the way the current language has been interpreted, there becomes a limit of 16 inches on floor framing regardless of stud height. Both I-joist and floor truss depths can exceed a 16 inches. Unless technical justification can be provided otherwise, there is no reason to limit the depth of the floor framing if the story height is not exceeded.

The IRC 16 inch floor framing limitation was brought into the IBC Conventional Light-Frame Construction section in the 2006 code change cycle in S191 with the following reasoning and was accepted as submitted:

Reason: Table 2308.9.1 of the IBC contains the spacing requirement for 10 foot studs, and it is assumed that 10 foot studs can be used for walls in buildings built under the conventional construction provisions of Section 2308. However, the current wording of Section 2308.2 of the code limits the floor-to-floor height to 10 feet, which precludes the use of 10-foot studs in bearing walls. The proposed change will make the scope of the section consistent with the requirements contained therein and also limit floor-to-floor heights for conventional light-frame construction provisions. A similar limitation can be found in Section R301.3 of the International Residential Code.

As in the case of the IRC, the intention was to limit story height not to limit floor framing height. Chapter 5 defines story height as follows: HEIGHT, STORY. The vertical distance from top to top of two successive finished floor surfaces; and, for the topmost story, from the top of the floor finish to the top of the ceiling joists or, where there is not a ceiling, to the top of the roof rafters.

There are no general limits on floor framing height elsewhere in the IBC, nor are there any limitations on floor framing height in chapter 23.

(IRC) Current limitations are based on a floor height of 16 inches. The current story height requirements were introduced in the 2003 code cycle by BCCS (RB39-02). The final proposal was extensively modified from the original proposal which dealt only with the stud height issue. The committee reason for accepting RB39-02 as modified was given as follows:

Committee Reason: Based on proponent's published reason. This code change has been modified from that originally submitted to the ICC in order to coordinate with the material limits currently contained in (and, in the case of wood, currently being added to) the IRC. The exception to Item 1 has been added at the request of other interested parties to accommodate the high ceilings that are currently common in some parts of the country.

No technical supporting documentation was provided for the 16 inch limitation on floor framing. Our assumption is that the intent of the code modification was to arrive at a maximum story height by setting a maximum floor framing depth to be used with a maximum stud height. However, the way the current language has been interpreted, a limit of 16 inches on floor framing regardless of stud height. Both I-joist and floor truss depths can exceed a 16 inches. Unless technical justification can be provided otherwise, there is no reason to limit the floor framing if the story height is not exceeded.

Chapter 2 defines story height as follows: HEIGHT, STORY. The vertical distance from top to top of two successive tiers of beams or finished floor surfaces; and, for the topmost story, from the top of the floor finish to the top of the ceiling joists or, where there is not a ceiling, to the top of the roof rafters.

Chapter 5 includes no limits on floor framing height, nor are there any limitations on floor framing in any of the individual material requirement sections.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

PART I — IBC

Committee Action:

Approved as Modified

Modify proposal as follows:

2308.2 Limitations. Buildings are permitted to be constructed in accordance with the provisions of conventional light-frame construction, subject to the following limitations, and to further limitations of Sections 2308.11 and 2308.12.

- Buildings shall be limited to a maximum of three stories above grade plane. For the purposes of this section, for buildings in Seismic Design Category D or E as determined in Section 1613, cripple stud walls shall be considered to be a story.

Exception: Solid blocked cripple walls not exceeding 14 inches (356 mm) in height need not be considered a story.

- ~~Maximum floor-to-floor height shall not exceed 11 feet 7 inches (mm). Bearing wall story-height shall not exceed a stud height of 10 feet (3048 mm), plus a height of floor framing not to exceed 16 inches (406 mm). Floor framing height shall be permitted to exceed this limit provided the story height limit is not exceeded.~~

(No changes to items 3 through 7)

Committee Reason: This proposal clarifies the limitation on story height under the conventional construction provisions. The modification states the maximum floor to floor height directly.

Assembly Action:

None

PART II — IRC

Committee Action:

Approved as Modified

Modify the proposal as follows:

R301.3 Story height. Buildings constructed in accordance with these provisions shall be limited to story heights of not more than the following:

(No change to items 1 - 4)

Individual walls or walls studs shall be permitted to exceed these limits as permitted by Chapter 6 provisions, provided story heights are not exceeded. Floor framing height shall be permitted to exceed these limits provided the story height ~~limit is not exceeded.~~ **does not exceed 11'-7"**. An engineered design shall be provided for the wall or wall framing members when they exceed the limits of Chapter 6. Where the story height limits are exceeded, an engineered design shall be provided in accordance with the International Building code for the overall wind and seismic force resisting systems.

Committee Reason: This change passed IBC Structural. Passing this keeps the code language the same in the IBC and the IRC. The added language allows more design flexibility and would allow I joists in garages and others where a longer uninterrupted span is desired or required.

Assembly Action:

None

Final Hearing Results

S100-06/07, Part I	AM
S100-06/07, Part II	AM

Code Change No: **S101-06/07**

Original Proposal

Section: 2308.2

Proponent: Randall Shackelford, Simpson Strong-Tie Co.

Revise as follows:

2308.2 Limitations. Buildings are permitted to be constructed in accordance with the provisions of conventional light-frame construction, subject to the following limitations, and to further limitations of Sections 2308.11 and 2308.12.

1. Buildings shall be limited to a maximum of three stories above grade plane. For the purposes of this section, for buildings in Seismic Design Category D or E as determined in Section 1613, cripple stud walls shall be considered to be a story.

Exception: Solid blocked cripple walls not exceeding 14 inches (356 mm) in height need not be considered a story.

2. Bearing wall floor-to-floor heights shall not exceed a stud height of 10 feet (3048 mm) plus a height of floor framing not to exceed 16 inches (406 mm).
3. Loads as determined in Chapter 16 shall not exceed the following:
 - 3.1. Average dead loads shall not exceed 15 psf (718 N/m²) for combined roof and ceiling, exterior walls, floors and partitions.

Exceptions:

1. Subject to the limitations of Sections 2308.11.2 and 2308.12.2, stone or masonry veneer up to the lesser of 5 inches (127 mm) thick or 50 psf (2395 N/m²) and installed in accordance with Chapter 14 is permitted to a height of 30 feet (9144 mm) above a noncombustible foundation, with an additional 8 feet (2438 mm) permitted for gable ends.
2. Concrete or masonry fireplaces, heaters and chimneys shall be permitted in accordance with the provisions of this code.
- 3.2. Live loads shall not exceed 40 psf (1916 N/m²) for floors.
- 3.3. Ground snow loads shall not exceed 50 psf (2395 N/m²).
4. Wind speeds shall not exceed 100 miles per hour (mph) (44 m/s) (3-second gust).

Exception: Wind speeds shall not exceed 110 mph (48.4 m/s) (3-second gust) for buildings in Exposure Category B that are not located in a hurricane prone region.

5. Roof trusses and rafters shall not span more than 40 feet (12 192 mm) between points of vertical support.
6. The use of the provisions for conventional light-frame construction in this section shall not be permitted for Occupancy Category IV buildings assigned to Seismic Design Category B, C, D, E or F, as determined in Section 1613.
7. Conventional light-frame construction is limited in irregular structures in Seismic Design Category D or E, as specified in Section 2308.12.6.

Reason: The purpose of this proposal is to revise wind limitation in the IBC to match the IRC

Studies conducted by the Institute for Business and Home Safety show that the conventional construction requirements of the IBC and IRC are frequently inadequate for wood buildings built where the design windspeed exceeds 100 mph. The IRC was revised to reflect this last code change cycle, but the IBC was not. This change will make the IRC and IBC have the same limitations.

Cost Impact: The code change proposal will increase the cost of construction in areas between 100 and 110 miles per hour if the buildings are currently being built without consideration of wind forces.

Public Hearing Results

Committee Action:**Approved as Submitted****Committee Reason:** This code change aligns the wind limitations for the IBC conventional construction provisions with those in the IRC.**Assembly Action:****None**

Final Hearing Results

S101-06/07**AS**
Code Change No: S102-06/07

Original Proposal

Sections: 2308.11.2, 2308.12.2**Proponent:** David W. Ware, Owens Corning**Revise as follows:**

2308.11.2 Concrete or masonry. Concrete or masonry walls and stone or masonry veneer shall not extend above the basement.

Exceptions:

1. Stone and masonry veneer is permitted to be used in the first two stories above grade plane or the first three stories above grade plane where the lowest story has concrete or masonry walls in Seismic Design Category B, provided that structural use panel wall bracing is used and the length of bracing provided is one- and one-half times the required length as determined in Table 2308.9.3(1).
2. Stone and masonry veneer is permitted to be used in the first story above grade plane or the first two stories above grade plane where the lowest story has concrete or masonry walls in Seismic Design Category B or C.
3. Stone and masonry veneer is permitted to be used in the first two stories above grade plane in Seismic Design Categories B and C, provided the following criteria are met:
 - 3.1. Type of brace per Section 2308.9.3 shall be Method 3 and the allowable shear capacity in accordance with Table 2306.4.1 shall be a minimum of 350 plf (5108 N/m).
 - 3.2. The bracing of the top story shall be located at each end and at least every 25 feet (7620 mm) o.c. but not less than 40 percent of the braced wall line. The bracing of the first story shall be located at each end and at least every 25 feet (7620 mm) o.c. but not less than 35 percent of the braced wall line.
 - 3.3. Hold-down connectors shall be provided at the ends of braced walls for the second floor to first floor wall assembly with an allowable design of 2,000 pounds (8896 N). Hold-down connectors shall be provided at the ends of each wall segment of the braced walls for the first floor to foundation with an allowable design of 3,900 pounds (17 347 N). In all cases, the hold-down connector force shall be transferred to the foundation.
 - 3.4. Cripple walls shall not be permitted.

2308.12.2 Concrete or masonry. Concrete or masonry walls and stone or masonry veneer shall not extend above the basement.

Exception: ~~M~~ Stone and masonry veneer is permitted to be used in the first story above grade plane in Seismic Design Category D, provided the following criteria are met:

1. Type of brace in accordance with Section 2308.9.3 shall be Method 3 and the allowable shear capacity in accordance with Table 2306.4.1 shall be a minimum of 350 plf (5108 N/m).
2. The bracing of the first story shall be located at each end and at least every 25 feet (7620 mm) o.c. but not less than 45 percent of the braced wall line.
3. Hold-down connectors shall be provided at the ends of braced walls for the first floor to foundation with an allowable design of 2,100 pounds (9341 N).
4. Cripple walls shall not be permitted.

Reason: This proposal ensures that requirements for masonry and stone materials are equally applied to all veneer type materials and provides consistency of terminology throughout relevant code sections. The intent of this code change is coordination and clarification. Past code language for stone and masonry materials has not clearly delineated specific provisions applying to adhered versus anchored systems. These proposed code changes build on approved modifications to these and ancillary code sections approved last year. The type of veneer is broadened to include stone and masonry, consistent with IBC Chapter 14 and IRC Section 703; and is consistent with changes approved last year to IBC Section 2308.2.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: This proposal clarifies the conventional construction provisions pertaining to the use of stone or masonry veneer. The necessary weight limitations are currently stated in Section 2308.2.

Assembly Action:

None

Final Hearing Results

S102-06/07

AS

Code Change No: S105-06/07

Original Proposal

Sections: 2406.1.1, 2406.2, Chapter 35; IRC R308.3, R308.3.1

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL AND THE IRC BUILDING/ENERGY CODE DEVELOPMENT COMMITTEES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

Proponent: William E. Koffel, P.E., Koffel Associates, Inc., representing Glazing Industry Code Committee

PART I – IBC

1. Revise as follows:

2406.1.1 CPSC 16 CFR 1201. Impact test. Except as provided in Sections 2406.1.2 through 2406.1.4, all glazing shall pass the impact test requirements of CPSC 16 CFR 1201, listed in Chapter 35 Section 2406.2. ~~Glazing shall comply with the CPSC 16 CFR, Part 1201 criteria, for Category I or II as indicated in Table 2406.1.~~

2. Add new text as follows:

2406.2 Impact test. Where required by other sections of the Code, glazing shall be tested in accordance with CPSC 16 CFR 1201. Glazing shall comply with the test criteria for Category I or II as indicated in Table 2406.2(1)

Exception: Glazing not in doors or enclosures for hot tubs, whirlpools, saunas, steam rooms, bathtubs and showers shall be permitted to be tested in accordance with ANSI Z97.1. Glazing shall comply with the test criteria for Class A or B as indicated in Table 2406.2(2).

3. Revise table as follows:

TABLE 2406.1-2406.2(1)
MINIMUM CATEGORY CLASSIFICATION OF GLAZING USING CPSC 16 CFR 1201

(No change to table entries)

4. Add new table as follows:

TABLE 2406.2(2)
MINIMUM CATEGORY CLASSIFICATION OF GLAZING USING ANSI Z97.1

<u>EXPOSED SURFACE AREA OF ONE SIDE OF ONE LITE</u>	<u>GLAZING IN STORM OR COMBINATION DOORS</u> (Category class)	<u>GLAZING IN DOORS</u> (Category class)	<u>GLAZED PANELS REGULATED BY ITEM 7 OF SECTION 2406.3</u> (Category class)	<u>GLAZED PANELS REGULATED BY ITEM 6 OF SECTION 2406.3</u> (Category class)	<u>DOORS AND ENCLOSURES REGULATED BY ITEM 5 OF SECTION 2406.3</u> (Category class)	<u>SLIDING GLASS DOORS PATIO TYPE</u> (Category class)
9 square feet or less	B	B	No requirement	B	A	A
More than 9 square feet	A	A	A	A	A	A

5. Revise Chapter 35 as follows:

ANSI

Z97.1-84 (R1994) 04

PART II – IRC

1. Revise as follows:

R308.3 Human impact loads. Individual glazed areas, including glass mirrors in hazardous locations such as those indicated as defined in Section R308.4, shall pass the test requirements of CPSC 16 CFR, Part 1201 Section 308.3.1. ~~Glazing shall comply with CPSC 16 CFR, Part 1201 criteria for Category I or Category II as indicated in Table R308.3.~~

Exception: Louvered windows and jalousies shall comply with Section R308.2.

2. Add new text as follows:

R308.3.1 Impact Test. Where required by other sections of the Code, glazing shall be tested in accordance with CPSC 16 CFR 1201. Glazing shall comply with the test criteria for Category I or II as indicated in Table R308.3.1(1).

Exception: Glazing not in doors or enclosures for hot tubs, whirlpools, saunas, steam rooms, bathtubs and showers shall be permitted to be tested in accordance with ANSI Z97.1. Glazing shall comply with the test criteria for Class A or B as indicated in Table R308.3.1 (2).

3. Revise table as follows:

TABLE R308.3 R308.3.1(1)
MINIMUM CATEGORY CLASSIFICATION OF GLAZING USING CPSC 16 CFR 1201

(Portions of table not shown do not change)

3. Add new table as follows:

TABLE R308.3.1(2)
MINIMUM CATEGORY CLASSIFICATION OF GLAZING USING ANSI Z97.1

<u>EXPOSED SURFACE AREA OF ONE SIDE OF ONE LITE GLAZING IN</u>	<u>GLAZING IN STORM OR COMBINATION DOORS (Category class)</u>	<u>GLAZING IN DOORS (Category class)</u>	<u>GLAZED PANELS REGULATED BY ITEM 7 OF SECTION 2406.3 (Category class)</u>	<u>GLAZED PANELS REGULATED BY ITEM 6 OF SECTION 2406.3 (Category class)</u>	<u>DOORS AND ENCLOSURES REGULATED BY ITEM 5 OF SECTION 2406.3 (Category class)</u>	<u>SLIDING GLASS DOORS PATIO TYPE (Category class)</u>
9 square feet or less	B	B	No requirement	B	A	A
More than 9 square feet	A	A	A	A	A	A

For SI: 1 square foot = 0.0929 m².

Reason: In 1977, the U.S. Consumer Products Safety Commission (“CPSC”) adopted as a mandatory federal safety regulation *Safety Standard for Architectural Glazing Materials*, codified at 16 CFR Part 1201. The CPSC amended its *Safety Standard for Architectural Glazing Materials* on several occasions subsequent to its initial adoption, the last time on June 28, 1982.

Set forth below are the more significant differences between these two standards, both standards applicable to safety glazing materials used in architectural applications. This reason statement makes no attempt to summarize all pertinent provisions of the two standards, only their significant differences.

The principal differences between the CPSC’s 16 CFR 1201 standard and the ANSI Z97.1-2004 standard relate to their scope and function. The CPSC standard is not only a test method and a procedure for determining the safety performance of architectural glazing, but also a federal standard that mandates where and when safety glazing materials must be used in architectural applications and preempts any non-identical state or local standard. In contrast, ANSI Z97 is only a voluntary safety performance specification and test method. It does not purport to indicate where and when safety glazing materials must be used, leaving those determinations up to the building codes and to glass and fenestration specifiers. In this instance, the IBC provides the requirements regarding the safety performance of architectural glazing beyond that which is covered by the federal standard.

The CPSC requires the installation of safety glazing materials meeting 16 CFR 1201 only in storm doors, combination doors, entrance-exit doors, sliding patio doors, closet doors, and shower and tub doors and enclosures. Other than that, meeting CPSC’s requirements is necessary only when and if a building code authority or other jurisdiction adopting safety glazing laws specifically mandates that safety glazing comply with the CPSC standard, 16 CFR 1201 -- and most building codes do. ANSI Z97, as a voluntary standard, applies only when, where, and if it is adopted by a building code authority or is specified in the approved plans and specifications of the architect, building contractor, or other glass specifier.

Test Specimens: For impact testing, the CPSC requires only one specimen of each nominal thickness be submitted for testing and specifies it must be the largest size the manufacturer produces up to a maximum of size of 34” by 76”. ANSI Z97 requires that four specimens of each nominal thickness and size must be impact-tested. The manufacturer has the option of testing either 34” by 76” specimens or the largest size it commercially produces less than 34” by 76”, but with a minimum size of 24” by 30”. A nominal thickness is defined as +/- 1/8-inch.

Types of Glass: The CPSC standard has no performance tests for plastics or for bent glass. ANSI Z97 has specific tests for both. The CPSC standard does not prohibit the use of ordinary annealed glass in hazardous locations as long as it passes the appropriate impact tests, consistent with the concept of a performance based impact test. (Thick, heavy annealed glass is likely to pass the CPSC 18-inch drop-height and 48-inch drop-height impact tests for Category I and II locations.) ANSI Z97.1-2004 contains an express limitation on annealed glass: “Monolithic annealed in any thickness is not considered safety glazing material under this standard.”

Asymmetrical Glazing Material: The CPSC standard requires all asymmetrical glazing materials to be impacted on both sides of each specimen and then evaluated under the pass-fail criteria. There is no exception. ANSI Z97 requires that, with the exception of mirror glazing, all asymmetrical glass specimens must be impacted on both sides, two on one side and two on the other. With respect to mirror glazing products using reinforced or non-reinforced organic adhesive backing, all four specimens must be impacted only on the non-reinforced side “and with no other material applied.”

Impact Categories or Levels: The CPSC standard has two distinct impact levels or categories, Category I and Category II, and specifies which defined hazardous location must contain Category II safety glazing materials and which may use Category I glazing materials. Glazing material successfully passing the impact test of a 48-inch drop height, a 400 foot-pound impact, is classified as “Category II” glass. Glazing material passing the 18-inch drop height, a 150 foot-pounds impact, is classified as “Category I” glass. ANSI Z97 has adopted three separate impact categories or classes, based upon impact performance. ANSI Z97’s Class A glazing materials are comparable to the CPSC’s Category II glazing materials, passing a 48-inch drop height test, and its Class B glazing materials are comparable to the CPSC’s Category I glazing materials, passing the 18-inch drop height test. ANSI Z97 also has a product-specific Class C impact test, a 12-inch drop height test, applicable only for fire-resistant glazing materials. However, the proposed code change does not identify Class C as an acceptable product for use in hazardous locations.

Pass-Fail Impact Criteria: The CPSC standard, like the ANSI standard, offers alternative criteria for evaluating whether a test specimen passes the impact test. The CPSC standard considers the specimen a pass if a 3-inch diameter solid steel ball, weighing 4 lbs., will not pass through the opening when placed on the specimen for one second. ANSI uses the 3-inch sphere measure, but does not require the sphere be a steel ball and does not specify the weight of the 3-inch sphere, but does require that the sphere not pass freely through the opening when a force of 4 lbs. is applied to the sphere. There is no time element associated with this alternative.

A second alternative pass-fail criterion under the CPSC standard involves weighing the 10 largest particles selected within five minutes after the impact test -- they must weigh no more than the equivalent weight of 10 square inches of the original specimen. The ANSI standard has an almost identical criterion, except the 10 largest particles must be “crack-free.” It also includes additional product-specific qualifications applicable solely to selecting the 10 largest particles of tempered glass and offers a formula for determining the weight of 10 square inches of the original specimen.

The CPSC standard has no separate pass-fail impact criteria for the scenario in which the glass specimen separates from the frame after impact and breaks or produces a hole in the glass. The ANSI standard has a special criterion for that scenario -- to pass, the glass is subjected to the same 3-inch sphere measure or to the weight criterion for the 10 largest crack-free particles.

The CPSC standard involves impact-testing of only a single specimen of each nominal glass thickness. Accordingly, if that specimen passes, all glass of that type and thickness is deemed to pass. Under the ANSI standard, four specimens of each type, size, and thickness must be impact tested, and if any one of the four specimens fails, there is a failure of that specific type, thickness, and size.

Impact Testing Apparatus: Relatively minor technical differences exist between the test frames and impactors specified in the CPSC standard and those in ANSI Z97.1. The ANSI standard prescribes special test frame and subframe configurations for impact-testing bent glass; the CPSC standard has no provisions for testing bent glass. The ANSI standard includes detailed specifications for the impactor suspension device and traction and release system and for their operation; the CPSC standard does not.

Weathering Tests: The CPSC standard requires a weathering test only for organic coated glass. ANSI requires a weathering test for laminated glass and plastics as well as for organic coated glass. The CPSC accelerated weathering test (only for organic coated glass) uses the xenon arc Weather-Ometer. The ANSI standard gives the manufacturer the choice of one of three weathering exposure alternatives, the xenon arc exposure, the enclosed twin carbon arc exposure, or the one-year outdoor exposure in South Florida. The ANSI prescribed xenon arc apparatus and procedure are the more current versions of the pertinent ASTM standards, ASTM G 155 and ASTM D 2565-92A, than the versions referenced in the CPSC standard. The CPSC's xenon arc procedure for interpreting results of the adhesion test requires an average adhesion value or pull force of no less than 90% of the average of the unexposed organic-coated glass specimens in order to "pass," whereas the ANSI standard requires no less than 75% of the average of the unexposed specimens.

Indoor Aging Tests: The CPSC standard does not prescribe any indoor aging test; the ANSI standard requires specified indoor aging tests for plastics and organic coated glass intended for indoor-use only, followed by impact tests.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

PART I – IBC

Committee Action:

Approved as Modified

Modify proposal as follows:

2406.1.1 Impact test. Except as provided in Sections 2406.1.2 through 2406.1.4, all glazing shall pass the impact test requirements of Section 2406.2.

2406.2 Impact test. Where required by other sections of the Code, glazing shall be tested in accordance with CPSC 16 CFR 1201. Glazing shall comply with the test criteria for Category I or II as indicated in Table 2406.2(1)

Exception: Glazing not in doors or enclosures for hot tubs, whirlpools, saunas, steam rooms, bathtubs and showers shall be permitted to be tested in accordance with ANSI Z97.1. Glazing shall comply with the test criteria for Class A or B as indicated in Table 2406.2(2).

**TABLE 2406.2(1)
MINIMUM CATEGORY CLASSIFICATION OF GLAZING USING CPSC 16 CFR 1201**

(No change to table contents)

**TABLE 2406.2(2)
MINIMUM CATEGORY CLASSIFICATION OF GLAZING USING ANSI Z97.1**

EXPOSED SURFACE AREA OF ONE SIDE OF ONE LITE	GLAZING IN STORM OR COMBINATION DOORS (Category class)	GLAZING IN DOORS (Category class)	GLAZED PANELS REGULATED BY ITEM 7 OF SECTION 2406.3 (Category class)	GLAZED PANELS REGULATED BY ITEM 6 OF SECTION 2406.3 (Category class)	DOORS AND ENCLOSURES REGULATED BY ITEM 5 OF SECTION 2406.3 ^a (Category class)	SLIDING GLASS DOORS PATIO TYPE (Category class)
9 square feet or less	B	B	No requirement	B	A	-A
More than 9 square feet	-A	-A	A	A	A	-A

a. Use is only permitted by the Exception to Section 2406.2.

Chapter 35:

ANSI
Z97.1- 04

Committee Reason: This proposal updates the code to include an exception for Class A and B glazing in accordance with the ANSI standard. The modification clarifies the intention by removing table columns that could lead to misapplication of the code.

Assembly Action:

None

PART II – IRC

Committee Action:

Disapproved

Committee Reason: There was a modification proposed to this code change proposal when it was heard by the structural committee. The IRC B/E committee voted to disapprove the proposed change since the modification was not also brought before this committee. The proponent was not present to answer questions or provide the modification.

Assembly Action:

None

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted for Part II.

Public Comment:

William E. Koffel, P.E., Koffel Associates, Inc., representing Glazing Industry Code Committee, requests Approval as Modified by this Public Comment for Part II.

Modify proposal as follows:

TABLE 308.3.1(2)
MINIMUM CATEGORY CLASSIFICATION OF GLAZING USING ANSI Z97.1

EXPOSED SURFACE AREA OF ONE SIDE OF ONE LITE	GLAZING IN STORM-OR COMBINATION DOORS (Category class)	GLAZING IN DOORS (Category class)	GLAZED PANELS REGULATED BY ITEM 7 OF SECTION R308.4 (Category class)	GLAZED PANELS REGULATED BY ITEM 6 OF SECTION R308.4 (Category class)	DOORS AND ENCLOSURES REGULATED BY ITEM 5 OF SECTION R308.4 ^a (Category class)	SLIDING GLASS DOORS PATIO-TYPE (Category class)
9 square feet or less	B	B	No requirement	B	A	A
More than 9 square feet	A	A	A	A	A	A

For SI: 1 square foot = 0.0929 m².

a. Use is only permitted by the exception to Section R308.3.1.

(Portions of the proposal not shown remain unchanged)

Commenter's Reason: The modification proposed is technically the same as the modification accepted in Part I of the code change proposal. As noted in the Committee Reason, the modification was not submitted during the hearing discussion on Part II of the code change proposal. Approval of the code change as modified by the Public Comment will be consistent with the action taken on Part II of the code change.

Final Hearing Results

S105-06/07, Part I AM
S105-06/07, Part II AMPC1

Code Change No: **S106-06/07**

Original Proposal

Sections: 2406.2.1, 2407.1, 2408.2.1, 2408.3; IRC R308.1.1

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL AND THE IRC BUILDING/ENERGY CODE DEVELOPMENT COMMITTEES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

Proponent: William E. Koffel, P.E., Koffel Associates, Inc., representing Glazing Industry Code Committee

PART I – IBC

Revise as follows:

2406.2.1 Multilight assemblies. Multilight glazed assemblies having individual lights not exceeding 1 square foot (0.09 m²) in exposed areas shall have at least one light in the assembly marked as indicated in Section 2406.2. Other lights in the assembly shall be marked "CPSC 16 CFR 1201" "or ANSI Z97.1," as appropriate.

2407.1 Materials. Glass used as a handrail assembly or a guard section shall be constructed of either single fully tempered glass, laminated fully tempered glass or laminated heat-strengthened glass. Glazing in railing in-fill panels shall be of an approved safety glazing material that conforms to the provisions of Section 2406.1.1. For all glazing types, the minimum nominal thickness shall be 1/4 inch (6.4 mm). Fully tempered glass and laminated glass shall comply with Category II of CPSC 16 CFR 1201, or Class A of ANSI Z97.1, listed in Chapter 35.

2408.2.1 Testing. Test methods and loads for individual glazed areas in racquetball and squash courts subject to impact loads shall conform to those of CPSC 16 CFR, ~~Part~~ 1201 or ANSI Z97.1, listed in Chapter 35, with impacts being applied at a height of 59 inches (1499 mm) above the playing surface to an actual or simulated glass wall installation with fixtures, fittings and methods of assembly identical to those used in practice.

Glass walls shall comply with the following conditions:

1. A glass wall in a racquetball or squash court, or similar use subject to impact loads, shall remain intact following a test impact.
2. The deflection of such walls shall not be greater than 1 1/2 inches (38 mm) at the point of impact for a drop height of 48 inches (1219 mm).

Glass doors shall comply with the following conditions:

1. Glass doors shall remain intact following a test impact at the prescribed height in the center of the door.
2. The relative deflection between the edge of a glass door and the adjacent wall shall not exceed the thickness of the wall plus 1/2 inch (12.7 mm) for a drop height of 48 inches (1219 mm).

2408.3 Gymnasiums and basketball courts. Glazing in multipurpose gymnasiums, basketball courts and similar athletic facilities subject to human impact loads shall comply with Category II of CPSC 16 CFR 1201, or Class A of ANSI Z97.1, listed in Chapter 35.

PART II – IRC

Revise as follows:

R308.1.1 Identification of multiple assemblies. Multipane assemblies having individual panes not exceeding 1 square foot (0.09 m²) in exposed area shall have at least one pane in the assembly identified in accordance with Section R308.1. All other panes in the assembly shall be labeled “CPSC 16 CFR 1201” or “ANSI Z97.1” as appropriate.

Reason: (IBC) For the most part the proposal is a companion to the GICC proposal to recognize ANSI Z97.1 as an alternative test procedure to CPSC 16 CFR 1201 for products not regulated by the federal standard. However, the proposal also addresses some other editorial issues. Section 2406.2.1 – returns to the language in the 2003 Edition of the IBC recognizing both test standards.

Section 2407.1 – recognizes the ANSI Z97.1 test standard.

Section 2408.2.1 – editorial clean-up with respect to the reference to the CPSC standard for consistency purposes and recognizes the ANSI Z97.1 test standard.

Section 2408.1 – recognizes the ANSI Z97.1 test standard.

It should be noted that Section 2409 already recognizes both test standards so a change was not necessary.

(IRC) The proposal is a companion to the GICC proposal to recognize ANSI Z97.1 as an alternative test procedure to CPSC 16 CFR 1201 for products not regulated by the federal standard. The proposal also inserts the letters “CPSC” in the mark to be consistent with the requirements in the IBC.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

PART I – IBC

Committee Action:

Approved as Submitted

Committee Reason: The code change adds an appropriate standard reference and is consistent with the action on S105-06/07.

Assembly Action:

None

PART II – IRC

Committee Action:

Disapproved

Committee Reason: The two standards; CPSC 16 CFR and the standard proposed to be added ANSI Z97.1 are not the same and should not be listed as alternatives for one another.

Assembly Action:

None

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted for Part II.

Public Comment:

William E. Koffel, P.E., Koffel Associates, Inc., representing Glazing Industry Code Committee, requests Approval as Submitted for Part II.

Commenter's Reason: S106-06/07, Part II was disapproved because S105-06/07, Part II was disapproved. A separate Public Comment has been submitted to address the modification that was not available during the discussion of S105-06/07. If the result of the Final Action Hearings is to Approve S105-06/07 as Modified by the Public Comment, approval of S106-06/07, Part II is merely correlative with that action.

Final Hearing Results

S106-06/07, Part I	AS
S106-06/07, Part II	AS

Code Change No: **S108-06/07**

Original Proposal

Section: 2407.1.2

Proponent: William E. Koffel, P.E., Koffel Associates, Inc., representing Glazing Industry Code Committee

Revise as follows:

2407.1.2 Support. Each handrail or guard section shall be supported by a minimum of three glass balusters or shall be otherwise supported to remain in place should one baluster panel fail. Glass balusters shall not be installed without an attached handrail or guard.

Exception: A top rail shall not be required where the glass balusters are laminated glass with two or more glass plies of equal thickness and the same glass type. The panels shall be designed to withstand the loads specified in Section 1607.7.

Reason: At the time the provisions of Section 2407.1.2 were developed the dominant glass used for baluster panels was single tempered glass. This glass was structurally adequate and had been successfully used. The required top rail was to provide a degree of protection should one baluster fail for any reason. Tempered glass characteristically may fail in a manner where it evacuates the opening.

In some applications the use of a top rail is an undesirable visual barrier. A typical example is the guard at the front of the spectator levels of sport arenas and theaters. In a number of these installations the top rail has been eliminated. The balusters have been laminated heat-strengthened or tempered glass complying with the IBC structural requirements for top rails. Variances from Section 2407.1.2 have been historically granted by building officials.

If one ply of the laminated glass breaks, the glass will remain in place. Unlike single tempered glass, it will not evacuate the opening. Even in the rare instance where both plies may simultaneously fail, the glass will remain in place.

It should be noted that the GICC has submitted another code change which proposes to delete Section 2407.1.2 in favor of reference two ASTM standards. If the section is deleted as recommended in the other proposal, the proposed exception is not required and this proposal should be recommended for Disapproval.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:**Approved as Modified****Modify proposal as follows:**

2407.1.2 Support. Each handrail or guard section shall be supported by a minimum of three glass balusters or shall be otherwise supported to remain in place should one baluster panel fail. Glass balusters shall not be installed without an attached handrail or guard.

Exception: A top rail shall not be required where the glass balusters are laminated glass with two or more glass plies of equal thickness and the same glass type when approved by the building official. The panels shall be designed to withstand the loads specified in Section 1607.7.

Committee Reason: The code change adds an option to a top rail that is now often permitted as an alternative method. The modification requires the approval of the building official and is intended to address a concern that in some uses such as schools and hospitals, glass breakage is not acceptable.

Assembly Action:**None**

Final Hearing Results

S108-06/07

AM

Code Change No: S110-06/07

Original Proposal

Section: 2508.4, Chapter 35**Proponent:** Marcelo M. Hirschler, GBH International, representing American Fire Safety Council**1. Revise as follows:**

2508.4 Joint treatment. Gypsum board fire-resistance-rated assemblies shall have joints and fasteners treated.

Exceptions:

1. Joint and fastener treatment need not be provided where any of the following conditions occur:
 - 1.1. Where the gypsum board is to receive a decorative finish such as wood paneling, battens, acoustical finishes or any similar application that would be equivalent to joint treatment.
 - 1.2. On single-layer systems where joints occur over wood framing members.
 - 1.3. Square edge or tongue-and-groove edge gypsum board (V-edge), gypsum backing board or gypsum sheathing.
 - 1.4. On multilayer systems where the joints of adjacent layers are offset from one to another.
 - 1.5. Assemblies tested without joint treatment.
2. Fire-resistance rated gypsum board assemblies shall be permitted to be fastened with a listed elastomeric joint material instead of being fastened with joint compound and joint tape where the following apply:
 - 2.1. The complete assembly, with the elastomeric joint material, meets a one hour fire resistance rating
 - 2.2. When tested in accordance with ASTM E 119, the elastomeric joint material complies with ASTM C 920, and
 - 2.3. The elastomeric joint material exhibits a modulus of 20 pounds per square inch (psi) or less at 100 percent elongation, when tested in accordance with ASTM C 1523 (both before and after artificial weathering).

2. Add standards to Chapter 35 as follows:**ASTM**

- | | |
|------------------|---|
| <u>C 920-05</u> | <u>Standard Specification for Elastomeric Joint Sealants</u> |
| <u>C 1523-04</u> | <u>Standard Test Method for Determining Modulus, Tear and Adhesion Properties of Precured Elastomeric Joint Sealants.</u> |

Reason: Elastomeric joint compound materials exist which can replace traditional joint compound and joint tape (traditional mud and tape joint) and generate a gypsum board assembly with a 1 hour fire resistance rating which outperforms (in terms of fire resistance rating) the traditional joint system. Test results from a screening test conducted at a nationally recognized test lab show that heat transfer to the unexposed side (as evidenced by temperature rise) takes longer with some elastomeric materials than with the traditional system (report is attached for information). Full scale ASTM E 119 tests are underway. The elastomeric systems have been in use for many years in residential environments because the use of a single component system makes application simpler. In recent years types of elastomeric compound have been developed which can meet the fire performance requirement needed to create 1 hour fire resistance rated assemblies. However, they cannot be used in applications where a 1 hour fire resistance rating is required, unless a change is made to the IBC.

The additional properties are also important for a successful elastomeric sealant to be able to meet the full range of needs of the drywall industry. Today, in residential construction, successful elastomeric sealants already are used to replace the typical “mud” and tape joint materials for residential wood stud framing. However, sealants that meet the fire resistance requirements should also provide great resistance to cracking if moderate movement should occur in the drywall – which is becoming a more prevalent problem than in decades past due to the growing use in the construction trade of fast-growth lumber, which is less dimensionally stable than the old-growth lumber that was prevalent in years or decades past. In order for a joint material to resist cracking successfully, it has been found that the more resilient the sealant, at low modulus, the better. It is important, given the tendency of drywall paper to tear or delaminate under stress, that a sealant exhibit a modulus not exceeding 20 psi, at 100% elongation. The lower the modulus the less adhesive stress is applied to the bond-line of the drywall/sealant interface when movement occurs and the less chance the drywall paper will fail. In order for an elastomeric sealant to successfully resist cracking for the longest possible period of time after installation, it is important for the sealant not to lose its initial elastomeric and low modulus properties over time. Thus, the modulus should remain the same even after weathering or aging. Sealants that are formulated with no plasticizers, which readily migrate from sealants that contain them and leave them relatively rigid and higher in modulus over time, are far superior and are able to perform over many years without failure. It is also likely that the common plasticizers used in elastomeric sealants make those sealants less fire resistant because such plasticizers are low molecular weight organic oils that readily burn.

It has been reported that numerous drywall contractors around the US have used low modulus, high performance latex sealants for several years to seal the joints in drywall. This has been done by those contractors to prevent the kind of cracking they have otherwise experienced when they have used the traditional joint tape and mud in many situations where relatively extreme shrinkage movement has occurred in the underlying framing lumber. Now that it is possible to provide not only crack resistance but also fire resistance in such a low modulus, high performance sealant, the drywall finishing trade has a new means of providing high quality drywall finishing, with no compromise in fire safety.

The new referenced standards are: ASTM C 920, Standard Specification for Elastomeric Joint Sealants, and ASTM C 1523, Standard Test Method for Determining Modulus, Tear and Adhesion Properties of Precured Elastomeric Joint Sealants. The ASTM C 920 specification does not include a test method for modulus, which is critical for long-term performance. The ASTM C 1523 test method contains the test method for modulus as well as a weathering test method, which needs to be used to assess whether the modulus is still suitably high after aging of the assembly. ASTM C 1442 (weathering practice) and ASTM C 717 (terminology) are also attached for information.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Note: The following analysis was not in the Code Change Proposal book but was published in the “Errata to the 2006/2007 Proposed Changes to the International Codes and Analysis of Proposed Referenced Standards” provided at the code development hearings:

Analysis: Review of proposed new standard indicated that, in the opinion of ICC staff, the standard did comply with ICC criteria for referenced standards.

Committee Action:

Disapproved

Committee Reason: This proposal appears to be out of place in this section since this is not an exception where “joint treatment” is not required but is instead an alternate product. Additionally the text addresses gypsum board being fastened with these materials. Item 2.3 would appear to be more appropriate for determining the acceptance under the standard and does not seem to be needed within the code. The committee did recognize that this is somewhat of a “chicken or the egg” issue. This can not go into the code because there is no standard, but because the code does not address it, there is no standard developed to test it. While conceptually fine, this proposal would create confusion regarding which test and product are acceptable when testing. The proposal should be coordinated with Table 2506.2 so that a conflict does not develop with the existing code requirements for gypsum board.

Assembly Action:

None

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Marcelo M. Hirschler, GBH International, representing Sashco, requests Approval as Modified by this public comment.

Replace proposal with the following:

**TABLE 2506.2
GYPSUM BOARD MATERIALS AND ACCESSORIES**

MATERIAL	STANDARD
Accessories for gypsum board	ASTM C 1047
Adhesives for fastening gypsum wallboard	ASTM C 557
Elastomeric joint sealants	ASTM C 920
Exterior soffit board	ASTM C 931
Fiber-reinforced gypsum panels	ASTM C 1278
Glass mat gypsum backing panel	ASTM C 1178
Glass mat gypsum substrate	ASTM C 1188
Gypsum backing board and gypsum shaftliner board	ASTM C 442
Gypsum ceiling board	ASTM C 1395
Gypsum sheathing	ASTM C 79
Gypsum wallboard	ASTM C 36
Joint reinforcing tape and compound	ASTM C 474; C 475
Nails for gypsum boards	ASTM C 514, F 547, F 1667
Predecorated gypsum board	ASTM C 960
Steel screws	ASTM C 954, C 1002
Steel studs, load bearing	ASTM C 955
Steel studs, nonload bearing	ASTM C 645
Standard specification for gypsum board	ASTM C 1396
Testing gypsum and gypsum products	ASTM C 22, C 472, C 473
Water-resistant gypsum backing board	ASTM C 630

Add standard to Chapter 35 as follows:

ASTM

C 920-05 Standard Specification for Elastomeric Joint Sealants

Commenter's Reason: As explained in the original proposal, "elastomeric joint sealant materials" exist now to seal gypsum board assemblies, replacing the traditional "joint reinforcing tape and compound". Some of those assemblies have been tested and meet the 1 hour fire resistance rating usually considered necessary for gypsum board assemblies. In fact, tests were conducted at Southwest Research Institute on two gypsum board assemblies and they showed that the assembly tested with the joints sealed with the elastomeric joint sealant material performed at least as well as the one tested with the traditional joint reinforcing tape and compound. The assembly with the elastomeric joint sealant material achieved a 1 hour fire resistance rating (including passing the hose stream test). This comment proposes a modification to the proposal to do exactly what the technical committee tacitly recommended, namely adding a row to Table 2506.2, with the corresponding standard specification for elastomeric joint sealants (ASTM C 920). If the proposal is accepted as modified by this comment, the IBC will recognize the elastomeric joint sealant materials as an acceptable gypsum board accessory material. The use of the material will then have to comply with the appropriate requirements in other parts of the code. ICC staff analysis already indicated at the proposal stage that the standard specification (ASTM C 920) complies with the ICC criteria for referenced standards.

Final Hearing Results

S110-06/07

AMPC1

Code Change No: S112-06/07

Original Proposal

Sections: 2509.2; IRC R702.4.2

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL AND THE IRC BUILDING/ENERGY CODE DEVELOPMENT COMMITTEES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

Proponent: John Mulder, James Hardie Building Products, Inc.

PART I – IBC

Revise as follows:

2509.2 Base for tile. Glass mat gypsum, Cement, fiber-cement or glass mat gypsum backers in compliance with ASTM C 1178, C 1288 or C 1325 and installed in accordance with manufacturer recommendations shall be used as a base for wall tile in tub and shower areas and wall and ceiling panels in shower areas. Water-resistant gypsum

backing board shall be used as a base for tile in water closet compartment walls when installed in accordance with GA-216 or ASTM C 840 and manufacturer recommendations. Regular gypsum wallboard is permitted under tile or wall panels in other wall and ceiling areas when installed in accordance with GA-216 or ASTM C 840.

PART II – IRC

Revise as follows:

R702.4.2. ~~Cement~~ Fiber-mat reinforced, fiber-cement and glass mat gypsum backers. ~~Cement~~ Fiber-mat reinforced, fiber-cement or glass mat gypsum backers in compliance with ASTM C 1325, C 1288, ~~C 1325~~ or C 1178 and installed in accordance with manufacturers' recommendations shall be used as backers for wall tile in tub and shower areas and wall panels in shower areas.

Reason: The current Code language does not adequately describe the "cement" backer within the context of its published Standard definition: "fiber-mat reinforced products, n – manufactured thin section composites of hydraulic cementitious matrices and non-asbestos fibers in two-dimensional scrim(s)" [published definition in ASTM C 1154-02]. Additionally, the order of the list of compliance specifications does not coincide with the order of the recognized product listing.

Description of product per ASTM C 1325-04, Non-Asbestos Fiber-mat Reinforced Cement Substrate Sheets. Definition per ASTM C 1154-02, Standard Terminology for Fiber-Reinforced Cement Products.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Errata: Revise Part I of code change to read as follows:

2509.2 Base for tile. ~~Glass mat gypsum, Cement, fiber-cement or glass mat gypsum~~ fiber-mat reinforced cement backers in compliance with ASTM C 1178, C 1288 or C 1325 and installed in accordance with manufacturer recommendations shall be used as a base for wall tile in tub and shower areas and wall and ceiling panels in shower areas. Water-resistant gypsum backing board shall be used as a base for tile in water closet compartment walls when installed in accordance with GA-216 or ASTM C 840 and manufacturer recommendations. Regular gypsum wallboard is permitted under tile or wall panels in other wall and ceiling areas when installed in accordance with GA-216 or ASTM C 840.

PART I — IBC Committee Action:

Approved as Modified

Modify the proposal as follows:

2509.2 Base for tile. Glass mat water-resistant gypsum backing panels, discrete non-asbestos fiber-cement interior substrate sheets or non-asbestos fiber-mat reinforced cement substrate sheets ~~backers~~ in compliance with ASTM C 1178, C 1288 or C 1325 and installed in accordance with manufacturer recommendations shall be used as a base for wall tile in tub and shower areas and wall and ceiling panels in shower areas. Water-resistant gypsum backing board shall be used as a base for tile in water closet compartment walls when installed in accordance with GA-216 or ASTM C 840 and manufacturer recommendations. Regular gypsum wallboard is permitted under tile or wall panels in other wall and ceiling areas when installed in accordance with GA-216 or ASTM C 840.

Committee Reason: This code change provides clarity on the materials to be used as a base for tile. The modification makes the wording more consistent with the referenced standard for these materials.

Assembly Action:

None

PART II — IRC

Committee Action:

Disapproved

Committee Reason: Based upon the action on code change S11106/07, Part II.

Assembly Action:

None

Final Hearing Results

S112-06/07, Part I	AM
S112-06/07, Part II	D

Code Change No: S113-06/07

Original Proposal

Table 1405.2, Table 2511.1.1, 2512.2, Table 2512.6, 2513.3

Proponent: Stephen V. Skalko, P.E., Portland Cement Association

Revise as follows:

**TABLE 1405.2
MINIMUM THICKNESS OF WEATHER COVERINGS**

COVERING TYPE	MINIMUM THICKNESS (INCHES)
Stucco or exterior portland cement plaster	

(Portions of table not shown do not change)

**TABLE 2511.1.1
INSTALLATION OF PLASTER CONSTRUCTION**

MATERIAL	STANDARD
Lathing and furring (cement plaster)	ASTM C 1063
Portland Cement plaster	ASTM C 926
Steel framing	ASTM C 754; C 1007

(Portions of table not shown do not change)

2512.2 Plasticity agents. Only approved plasticity agents and approved amounts thereof shall be added to portland cement or blended cements. When plastic cement or masonry cement is used, no additional lime or plasticizers shall be added. Hydrated lime or the equivalent amount of lime putty used as a plasticizer is permitted to be added to cement plaster or cement and lime plaster in an amount not to exceed that set forth in ASTM C 926.

**TABLE 2512.6
CEMENT PLASTERS^a**

c. Finish coat plaster is permitted to be applied to interior ~~portland~~ cement plaster base coats after a 48-hour period.

(Portions of table and footnotes not shown do not change)

2513.3 Bedding coat proportions. The bedding coat for interior or exterior surfaces shall be composed of one-part portland cement; and one-part Type S lime; or one-part blended cement and one-part Type S lime; or masonry cement; or plastic cement, and a maximum of three parts of graded white or natural sand by volume. The bedding coat for interior surfaces shall be composed of 100 pounds (45.4 kg) of neat gypsum plaster and a maximum of 200 pounds (90.8 kg) of graded white sand. A factory-prepared bedding coat for interior or exterior use is permitted. The bedding coat for exterior surfaces shall have a minimum compressive strength of 1,000 pounds per square inch (psi) (6895 kPa).

Reason: This proposal is to provide consistency within Chapters 14 and 25 of the IBC on the use of cements for interior and exterior plaster (stucco) work. The changes can be summarized as follows:

The word portland is being deleted from Table 1405.2 for type of weathering covering since cement plaster is a defined term in Chapter 25 and can be comprised of portland cement, blended cement, masonry cement and plastic cement.

The word portland is being deleted from Table 2511.1 and Footnote (c) to Table 2512.6 for the type of plaster since cement plaster is a defined term in Chapter 25 and can be comprised of portland cement, blended cement, masonry cement and plastic cement.

ASTM C926 also permits blended cements to be used in cement plaster mixes in combination with plasticity agents. This change adds these acceptable cementitious materials to the list of cementitious materials regulated by Section 2512.2

ASTM C926 also permits blended cements, masonry cements and plastic cements to be used in cement plaster mixes. This change adds these acceptable cementitious materials to the list of cementitious materials regulated by Section 2513.3

Cost Impact: This code change proposal will not increase the cost of construction

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: This code change improves the terminology for cement plaster provisions by making it consistent with ASTM C926.

Assembly Action:

None

Final Hearing Results

S113-06/07

AS

Code Change No: S114-06/07

Original Proposal

Section: 2512.1

Proponent: Stephen V. Skalko, P.E., Portland Cement Association

Revise as follows:

2512.1 General. Plastering with cement plaster shall be not less than three coats when applied over metal lath or wire fabric lath or gypsum board backing as specified in Section 2510.5 and shall be not less than two coats when applied over masonry, or concrete or gypsum board backing as specified in Section 2510.5. If the plaster surface is to be completely covered by veneer or other facing material, or is completely concealed by another wall, plaster application need only be two coats, provided the total thickness is as set forth in ASTM C 926.

Reason: ASTM C 926 specifies that two-coat plaster is only to be used over surfaces of solid bases that are rigid such as masonry, stone or concrete. Three-coat finishes are intended to be applied over other less rigid bases such as gypsum board, wood or rigid foam-board type products. This proposal makes the code consistent with ASTM C926.

Cost Impact: The code change will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: This change makes the number of cement plaster coats that are required over gypsum backing board consistent with ASTM C 926.

Assembly Action:

None

Final Hearing Results

S114-06/07

AS

Code Change No: **S115-06/07**

Original Proposal

Chapter 35

Proponent: Standards Writing Organization

Revise standards as follows:

AA

The Aluminum Association
1525 Wilson Blvd, Suite 600
Arlington, VA 22209

Standard reference number	Title
ADM1 <u>2005</u> 00	Aluminum Design Manual: Part I-A Specification for Aluminum Structures - Allowable Stress Design; and Part I-B Specification for Aluminum Structures - Building Load and Resistance Factor Design

APA

APA-Engineered Wood Association
P. O. Box 11700
Tacoma, WA 98411-0700

Standard reference number	Title
EWS R540- <u>02</u> 96	Builders Tips: Proper Storage and Handling of Glulam Beams
EWS-T300- <u>05</u> 02	Glulam Connection Details
EWS X440- <u>03</u> 00	Product Guide - Glulam

ASTM

ASTM International
100 Barr Harbor Drive
West Conshohocken, PA 19428-2959

Standard reference number	Title
A 6/A 6M- <u>05a</u> 04a	Specification for General Requirements for Rolled Structural Steel Bars, Plates, Shapes, and Sheet Piling
A 36/A 36M- <u>05</u> 04	Specification for Carbon Structural Steel
A 82/A 2M- <u>05a</u> 02	Specification for Steel Wire, Plain, for Concrete Reinforcement
A 153/A153M- <u>05</u> 03	Specification for Zinc Coating (Hot Dip) on Iron and Steel Hardware
A 185/A 185M- <u>05a</u> 02	Specification for Steel Welded and Seamless Steel Pipe Piles
A 307- <u>04</u> 03	Specification for Carbon Steel Bolts and Studs, 60,000 psi Tensile Strength
A 421/A 421M- <u>05</u> 02	Specification for Uncoated Stress-relieved Steel Wire for Prestressed Concrete
A 480/A 480M- <u>05</u> 02	Specification for General Requirements for Flt-rolled Stainless and Heat-resisting Steel Plate, Sheet and Strip
A 496/A 496M- <u>05</u> 02	Specification for Steel Wire, Deformed for Concrete Reinforcement
A 497 A 497M- <u>05a</u> 01	Specification for Steel Welded Reinforcement Deformed, for Concrete
A 568/A 568M- <u>05a</u> 03	Specification for Steel, Sheet, Carbon, and High-Strength, Low-Allow, Hot-rolled and Cold-rolled, General Requirements for
A 588/A 588M- <u>05</u> 04	Specification for High-strength Low-allow Structural Steel with 50 ksi (345 Mpa) Minimum Yield Point to 4 inches (100mm) Thick
A 615/A 615M- <u>05a</u> 04a	Specification for Deformed and Plain Billet-steel Bars for Concrete Reinforcement
A 690/A 690M- <u>05</u> 00a	Standard Specification for High Strength Low-allow Steel H-Piles and Sheet Piling for Use in Marine Environments

CODE CHANGES RESOURCE COLLECTION – INTERNATIONAL BUILDING CODE

A 706/A 706M- <u>05a</u> 04a	Specification for Low-alloy Steel Deformed and Plain Bars for Concrete Reinforcement
A 722/A 722M- <u>05 98</u> (2003)	Specification for Uncoated High-strength Steel Bar for Prestressing Concrete
A 767/A 767M- <u>05 00b</u>	Specification for Zinc-coated (Galvanized) Steel Bars for Concrete Reinforcement
A 775/A 775M- <u>04a</u>	Specification for Epoxy-coated Steel Reinforcing Bars
A 884- <u>04 02</u>	Specification for Epoxy-coated Steel Wire and Welded Wire Fabric for Reinforcement
A 992/A <u>992M-04a</u>	Standard Specification for Structural Shapes
A 996/A 996M- <u>05a</u> 04	Specification for Rail-steel and Axle-steel Deformed Bars for Concrete Reinforcement
A 1008/A 1008M- <u>05b</u> 04b	Specification for Steel, Sheet, Cold-rolled, Carbon, Structural, High-strength Low-alloy and High-strength Low-alloy with Improved Formability
B 695- <u>04 00</u>	Standard Specification for Coatings of Zinc Mechanically Deposited on Iron and Steel
C 22/C-22M-00(2005)e01	Specification for Gypsum
C 28/C-28M-00e04(2005)	Specification for Gypsum Plasters
C 31/31M- <u>03a</u> 98	Practice for Making and Curing concrete Test Specimens in the Field
C 35- <u>01</u> (2005 4) 95	Specification for Inorganic Aggregates for Use in Gypsum Plaster
C 56- <u>96</u> (2004) <u>05</u>	Specification for Structural Clay Non-Load-Bearing Tile
C 62- <u>05</u> 044	Specification for Building Brick (Solid Masonry Units Made From Clay or Shale)
C 67- <u>05</u> -03ae04	Test Methods of Sampling and Testing Brick and Structural Clay Tile
C 90- <u>06</u> 03a	Specification for Loadbearing Concrete Masonry Units
C 91- <u>05</u> 03a	Specification for Masonry Cement
C 109/C 109M- <u>05</u> 02	Standard Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2-in. or [50-mm] Cube Specimens)
C 126-99(2005)	Specification for Ceramic Glazed Structural Clay Facing Tile, Facing Brick, and Solid Masonry Units
C 150- <u>05</u> 04a	Specification for Portland Cement
C 199-84 (2005 0)	Test Method for Pier Test for Refractory Mortars
C 207- <u>06</u> 04	Specification for Hydrated Lime for Masonry Purposes
C 216- <u>05a</u> 04a	Specification for Facing Brick (Solid Masonry Units Made From Clay or Shale)
C 270- <u>05a</u> 04	Specification for Mortar for Unit Masonry
C 317/C 317M-00(2005)	Specification for Gypsum Concrete
C 473- <u>05</u> 03	Test Methods for Physical Testing of Gypsum Panel Products
C 503- <u>05</u> 03	Specification for Marble Dimension Stone (Exterior)
C 578- <u>05a</u> 04	Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation
C 587- <u>04</u> 02	Specification for Gypsum Veneer Plaster
C 595- <u>05</u> 03	Specification for Blended Hydraulic Cements
C 631-95a(2000 4)	Specification for Bonding Compounds for Interior Gypsum Plastering
C 645-04a	Specification for Nonstructural Steel Framing Members
C 652- <u>05a</u> 04a	Specification for Hollow Brick (Hollow Masonry Units Made from Clay or Shale)
C 744- <u>05</u> 99	Specification for Prefaced Concrete and Calcium Silicate Masonry Units
C 840- <u>05</u> 04	Specification for Application and Finishing of Gypsum Board
C 844- <u>04</u> 99	Specification for Application of Gypsum Base to Receive Gypsum Veneer Plaster
C 887- <u>05</u> 79a(2004)	Specification for Packaged, Dry, Combined Materials for Surface Bonding Mortar
C 897- <u>05</u> 00	Specification for Aggregate for Job-Mixed Portland Cement-Based Plasters
C 926-98a(2005)	Specification for Application of Portland Cement-Based Plaster
C 932- <u>05</u> 03	Specification for Surface-Applied Bonding Agents for Exterior Plastering

C 933-05 04	Specification for Welded Wire Lath
C 954-04 00	Specification for Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Steel Studs from 0.033 inch (0.84 mm) to 0.112 inch (2.84 mm) in Thickness
C 1002-04 04	Specification for Steel Self-Piercing Tapping Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs
C1019-05 03	Test Method for Sampling and Testing Grout
C 1047-05 99	Specification for Accessories for Gypsum Wallboard and Gypsum Veneer Base
C 1072-05b 00a	Standard Text Method for Measurement of Masonry Flexural Bond Strength
C 1177/C 1177M-04e01	Specification for Glass Mat Gypsum Substrate for Use as Sheathing
C 1178/C 1178M-04e01	Specification for Glass Mat Water-Resistant Gypsum Backing Panel
C 1261-05 04	Specification for Firebox Brick for Residential Fireplaces
C 1278/C 1278M-03e01	Specification for Fiber-Reinforced Gypsum Panels
C 1288-99(2004) 04	Standard Specification for Discrete Non-Asbestos Fiber-Cement Interior Substrate Sheets
C 1328-05 03a	Specification for Plastic (Stucco Cement)
C 1329-05 04	Specification for Mortar Cement
C 1395/C 1395M-04	Specification for Gypsum Ceiling Board
C 1405-00a05a	Standard Specification for Glazed Brick (Single Fired, Solid Brick Units)
D 25-99e04(2005)	Specification for Round Timber Piles
D 1557-02e01	Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lb/ft ³ (2,700kN-m/m ³))
D 2166-00e01	Test Method for Unconfined Compressive Strength of Cohesive Soil
D 2216-05 98	Test Method for Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass
D 2843-99(2004)e01	Test for Density of Smoke from the Burning or Decomposition of Plastics
D 3200-74(2005)	Standard Specification and Test Method for Establishing Recommended Design Stresses for Round Timber Construction Poles
D 3737-05 03	Practice for Establishing Allowable Properties for Structural Glued Laminated Timber (Glulam)
D 4318-05 00	Test Method for Liquid Limit, Plastic Limit, and Plasticity Index of Soils
D 5055-05 04	Specification for Establishing and Monitoring Structural Capacities of Prefabricated Wood I-Joists
D 5456-05a 03	Specification for Evaluation of Structural Composite Lumber Products
E 72-05 02	Standard Test Methods of Conducting Strength Tests of Panels for Building Construction
E 605-93(2006) 00	Test Method for Thickness and Density of Sprayed Fire-Resistive Material (SFRM) Applied to Structural Members
E 736-00(2006)	Test Method for Cohesion/Adhesion of Sprayed Fire-Resistive Materials Applied to Structural Members
E 1886-05 04	Test Method for Performance of Exterior Windows, Curtain Walls, Doors and Storm Shutters Impacted by Missiles and Exposed to Cyclic Pressure Differentials
E 1996-05b 04	Specification for Performance of Exterior Windows, Curtain Walls, Doors and Storm Shutters Impacted by Windborne Debris in Hurricanes

AWPA

American Wood-Preservers' Association
P. O. Box 361784
Birmingham, AL 35236-1784

Standard
reference
number

Title

M4-02 06

Standard for Care of Preservative-Treated Wood Products

U1-04 06

USE CATEGORY SYSTEM: User Specification for Treated wood except Section 7 Commodity Specification H

DOC

U.S. Department of Commerce
National Institute of Standards and Technology
100 Bureau Drive Stop 3460
Gaithersburg, MD 20899

Standard
reference
number

Title

PS 2-04 95 Performance Standard for Wood-Based Structural-Use Panels

HPVA

Hardwood Plywood Veneer Association
1825 Michael Faraday Drive
Reston, VA 20190-5350

Standard
reference
number

Title

HP-1-2004 2000 Standard for Hardwood and Decorative Plywood

UL

Underwriters Laboratories, Inc.
333 Pfingsten Road
Northbrook, IL 60062-2096

Standard
reference
number

Title

641-95 Type L Low-temperature Venting Systems-with Revisions through August 2005 April-1999

Reason: The *ICC Code Development Process for the International Codes (Procedures)* Section 4.5* requires the updating of referenced standards to be accomplished administratively, and be processed as a Code Proposal. In May 2005, a letter was sent to each developer of standards that are referenced in the I-Codes, asking them to provide ICC with a list of their standards in order to update to the current edition. Above is the list received of the referenced standards under the maintenance responsibility of the IRC Committee.

***4.5 Updating Standards:** The updating of standards referenced by the Codes shall be accomplished administratively by the appropriate code development committee in accordance with these full procedures except that multiple standards to be updated may be included in a single proposal.

Public Hearing Results

Errata: Add the following standard update

DOC
PS 20-99 05 American Softwood Lumber Standard

Committee Action:

Approved as Modified

Modify the proposal as follows:

ASTM

ASTM International 100 Barr Harbor Drive West Conshohocken, PA 19428-2959
Standard reference number Title
A 615/A 615M-05a Specification for Deformed and Plain Billet 04a steel Bars for Concrete Reinforcement
A 706/A 706M-05a Specification for Low-alloy Steel Deformed and 04a Plain Bars for Concrete Reinforcement

(Portions of proposal not shown remain unchanged)

Committee Reason: The proposal makes necessary updates to existing referenced standards. The modification retains the current edition of ASTM standards that are also referenced by ACI 318 for consistency with that standard.

Assembly Action:

None

Final Hearing Results

S115-07/07

AM

Code Change No: **S116-06/07**

Original Proposal

Sections: 1607.11.2, 1613.6.1

Proponent: Philip Brazil, P.E., Reid Middleton, Inc., representing himself

Revise as follows:

1. 1607.11.2 Reduction in roof live loads. The minimum uniformly distributed roof live loads, L_o , in Table 1607.1 are permitted to be reduced according to the following provisions in accordance with Section 1607.11.2.1 or 1607.11.2.2.

1607.11.2.1 Flat, pitched and curved roofs. No change to text.

1607.11.2.2 Special-purpose roofs. No change to text.

~~1607.11.2.3~~ **1607.11.3 Landscaped roofs.** No change to text.

~~1607.11.2.4~~ **1607.11.4 Awnings and canopies.** No change to text.

2. 1613.6.1 Assumption of flexible diaphragm. Add the following text at the end of Section 12.3.1.1 of ASCE 7.

Diaphragms constructed of wood structural panels or untopped steel decking shall also be permitted to be idealized as flexible, provided all of the following conditions are met:

1. Toppings of concrete or similar materials are not placed over wood structural panel diaphragms except for nonstructural toppings no greater than 1-1/2 inches (38 mm) thick.
2. Each line of vertical elements of the lateral seismic-force-resisting system complies with the allowable story drift of Table 12.12-1.
3. Vertical elements of the lateral seismic-force-resisting system are light-framed walls sheathed with wood structural panels rated for shear resistance or steel sheets.
4. Portions of wood structural panel diaphragms that cantilever beyond the vertical elements of the lateral-force-resisting system are designed in accordance with Section 2305.2.5 of the International Building Code.

Reason: Item 1 clarifies which provisions are intended to be referenced. Also, current Sections 1607.1.2.3 and 1607.11.2.4 do not contain provisions for the reduction of roof live loads and are renumbered accordingly. Item 2 rewording is needed because ASCE 7-05 does not define or use the term "lateral-force-resisting system."

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: This code change makes editorial changes that improve the provisions for roof live load reductions as well as flexible diaphragms under seismic loads.

Assembly Action:

None

Final Hearing Results

S116-06/07

AS

Code Change No: S117-06/07

Original Proposal

Table 2306.4.4

Errata: The following proposal was not published in the monograph:

Proponent: Louis Wagner, American Fiberboard Association

Delete Table 2306.4.4 and substitute as follows:

TABLE 2306.4.4 ALLOWABLE SHEAR VALUES (plf) FOR WIND OR SEISMIC LOADING ON SHEAR WALLS OF FIBERBOARD SHEATHING BOARD CONSTRUCTION FOR TYPE V CONSTRUCTION ONLY ^{a,b,c,d,e}

THICKNESS AND GRADE	FASTENER SIZE	ALLOWABLE SHEAR VALUE (pounds per linear foot) nail spacing at panel edges (inches) ^a		
		4	3	2
1/2" or 25/32" Structural	No. 11 gage galvanized roofing nail 1-1/2" long for 1/2", 1-3/4" for 25/32" with 3/8" head	170	230	260
	No. 16 gage galvanized staple, 7/16" crown f	150	200	225
	No. 16 gage galvanized staple, 1" crown f	220	290	325

For SI: 1 inch = 25.4 mm, 1 pound per foot = 14.5939 N/m

- a. Fiberboard sheathing shall not be used to brace concrete or masonry walls.
- b. Panel edges shall be backed with 2 inch or wider framing of Douglas fir-larch or Southern pine. For framing of other species: (1) Find specific gravity for species of framing lumber in AF&PA NDS. (2) For staples, multiply the shear value from the table above by 0.82 for species with specific gravity of 0.42 or greater, or 0.65 for all other species. (3) For nails, multiply the shear value from the table above by the following adjustment factor: Specific Gravity Adjustment Factor = [1-(0.5-SG)], where SG = Specific gravity of the framing lumber.
- c. Values shown are for fiberboard sheathing on one side only with long panel dimension either parallel or perpendicular to studs. d Fastener shall be spaced 6 inches on center along intermediate framing members.
- e. Values are not permitted in Seismic Design Category D, E, or F.
- f. Staple length shall not be less than 1-1/2" for 25/32-inch sheathing or 1-1/4" for 1/2-inch sheathing.

Reason: This change incorporates revisions consistent with those implemented in the reference document SDPWS-05 for nailed fiberboard shear walls. Nailed values are based on requirements in ASTM C208 for fiberboard and test values in PFS Test Report #96-60 such that the minimum target ratio of test load to allowable load is 2.8. Test results for 2 inch edge nail spacing are adjusted to 3" and 4" edge nail spacing assuming load per nail for 2 inch edge nailing is 75% of that for less dense 3 inch and 4 inch edge nail patterns. The ratio of 75% is based on minimum requirements of ASTM C208 for 3 inch edge nail spacing. During a prior change submittal, cyclic data was not available for fiberboard shear walls. Cyclic testing has been conducted and results are reported in WMEL-2002-03 (see page 56). Results confirm adequacy in resisting cyclic loads as the ratio of cyclic to monotonic strength values were equivalent to those for wood structural panel control walls. Stapled values are derived from tests (PFS Test Report #96-60) in a consistent manner to nailed values such that the minimum target ratio of test load to allowable load will be 2.8. Values are not permitted for lateral resistance in Seismic Design Categories D, E, or F consistent with provisions of the SDPWS-05 for nailed fiberboard shear walls.

Cost Impact: The code change proposal will not increase the cost of construction.

Bibliography:

Special Design Provisions for Wind and Seismic (SDPWS) 2005 Edition American Forest & Paper Association Available at <http://www.awc.org/pdf/windsiesmicsupp.pdf> Monotonic and Cyclic Tests of Shear Walls With Gypsum Wallboard, Fiberboard and Hardboard Siding Report No. WMEL-2002-03 Dolan and Toothman Available at www.fiberboard.org PFS Test Report#96-60 Available at www.fiberboard.org

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: This proposal provides updated allowable shear values for fiberboard sheathing that should be included since they are based on cyclic testing.

Assembly Action:

None

Final Hearing Results

S117-06/07

AS

2006 INTERNATIONAL ENERGY CONSERVATION CODE

Code Change No: **EC28-06/07**

Original Proposal

Sections: IECC: 202, 402.5, 402.5.1 (New), Table 402.5.1 (New), 402.5.2 (New), 402.5.3 (New), 402.2.8, 502.5, 502.5.1 (New), Table 502.5.1 (New), 502.5.2 (New), 502.5.3 (New)

IRC: 202, R318, R318.1, R408.3, R702.3.8, R806.2, N1102.2.8, N1102.5, N1102.5.1 (New), Table N1102.5.1 (New), N1102.5.2 (New), N1102.5.3 (New)

IBC: 202, 1203.2, 1203.3.2, 1403.2, 1910.1, 2509.3, 2510.6

IMC: 202

THIS PROPOSAL IS ON THE AGENDA OF THE IECC, IRC, IBC GENERAL, IBC FIRE SAFETY, IBC STRUCTURAL AND THE IRC BUILDING/ENERGY CODE DEVELOPMENT COMMITTEES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

Proponent: Joseph Lstiburek, Building Science Corporation, representing himself

PART I – IECC

1. Delete and substitute as follows:

VAPOR RETARDER. A vapor resistant material, membrane or covering such as foil, plastic sheeting, or insulation facing having a permeance rating of 1 perm ($5.7 \times 10^{-11} \text{ kg/Pa} \cdot \text{E s}^{-1} \cdot \text{Em}^2$) or less when tested in accordance with the desiccant method using Procedure A of ASTM E-96. Vapor retarders limit the amount of moisture vapor that passes through a material or wall assembly.

VAPOR RETARDER CLASS. A measure of a material or assembly's ability to limit the amount of moisture that passes through that material or assembly. Vapor retarder class shall be defined using the desiccant method of ASTM E-96 as follows:

Class I: 0.1 perm or less

Class II: $0.1 < \text{perm} \leq 1.0$ perm

Class III: $1.0 < \text{perm} \leq 10$ perm

Class IV: Greater than 10 perm

402.5 Moisture control. (Mandatory). The building design shall not create conditions of accelerated deterioration from moisture condensation. Above-grade frame walls, floors and ceilings not ventilated to allow moisture to escape shall be provided with an approved vapor retarder. The vapor retarder shall be installed on the warm-in-winter side of the thermal insulation.

Exceptions:

1. In construction where moisture or its freezing will not damage the materials.
2. Frame walls, floors and ceilings in jurisdictions in Zones 1, 2, 3, 4A and 4B. (Crawl space floor vapor retarders are not exempted.)
3. Where other approved means to avoid condensation are provided.

402.5 Vapor retarders. Class I or II vapor retarders are required on the interior side of walls in Zones 5, 6, 7, 8 and Marine 4.

Exceptions:

1. Basement walls.
2. Below grade portion of any wall.
3. Construction where moisture or its freezing will not damage the materials.

2. Add new text as follows:

402.5.1 Class III vapor retarders. Class III vapor retarders shall be permitted where the conditions in Table 402.5.1 are met.

**TABLE 402.5.1
CLASS III VAPOR RETARDERS**

<u>Zone</u>	<u>Class III vapor retarders permitted for:</u>
<u>Marine 4</u>	<u>Vented cladding over OSB</u> <u>Vented cladding over Plywood</u> <u>Vented cladding over Fiberboard</u> <u>Vented cladding over Gypsum</u> <u>Insulated sheathing with R-value \geq 2.5 in 2x4 wall</u> <u>Insulated sheathing with R-value \geq 3.75 in 2x6 wall</u>
<u>5</u>	<u>Vented cladding over OSB</u> <u>Vented cladding over Plywood</u> <u>Vented cladding over Fiberboard</u> <u>Vented cladding over Gypsum</u> <u>Insulated sheathing with R-value \geq 5 in 2x4 wall</u> <u>Insulated sheathing with R-value \geq 7.5 in 2x6 wall</u>
<u>6</u>	<u>Vented cladding over Fiberboard</u> <u>Vented cladding over Gypsum</u> <u>Insulated sheathing with R-value \geq 7.5 in 2x4 wall</u> <u>Insulated sheathing with R-value \geq 11.25 in 2x6 wall</u>
<u>7 and 8</u>	<u>Insulated sheathing with R-value \geq 10 in 2x4 wall</u> <u>Insulated sheathing with R-value \geq 15 in 2x6 wall</u>

402.5.2 Material vapor retarder class. The vapor retarder class shall be based on the manufacturer's certified testing or a tested assembly.

The following shall be deemed to meet the class specified:

- Class I: Sheet polyethylene, non-perforated aluminum foil
- Class II: Kraft faced fiberglass batts
- Class III: Latex paint
- Class IV: House wrap, building paper.

402.5.3 Minimum clear air spaces and vented openings. For the purposes of this section vented shall include the following minimum clear air spaces. Other openings with the equivalent net free area shall be permitted.

1. Stucco with a 3/8 inch clear airspace with 3/8 inch continuous slot vent openings at the top and bottom of each wall.
2. Brick with a 2 inch clear airspace behind the brick with vents at both the top and bottom of the brick. The vents shall be 3/8 inch x 2.5 inch openings every third brick at both the bottom and top course of each wall.
3. Stone or Masonry Veneer with a 2 inch clear airspace behind the stone with vents at the top and bottom. The vents shall have at least 1 square inch of vent area for every 24 inches of wall.
4. Panel Siding with 3/8 inch clear airspace with 3/8 inch continuous slot vent openings at both the top and bottom of each wall.
5. Wood, Wood Based, or Fiber Cement Siding with either a 1/4 inch clear airspace; or alternatively a 1/4 inch gap between the horizontal siding laps
6. Other approved clear air spaces and vented openings.

3. Revise as follows:

402.2.8 Crawl space walls. As an alternative to insulating floors over crawl spaces, crawl space walls shall be permitted to be insulated when the crawl space is not vented to the outside. Crawl space wall insulation shall be permanently fastened to the wall and extend downward from the floor to the finished grade level and then vertically and/or horizontally for at least an additional 24 inches (610 mm). Exposed earth in unvented crawl space foundations shall be covered with a continuous Class I vapor retarder. All joints of the vapor retarder shall overlap by 6 inches (153 mm) and be sealed or taped. The edges of the vapor retarder shall extend at least 6 inches (153 mm) up the stem wall and shall be attached to the stem wall.

4. Delete and substitute as follows:

~~**502.5 Moisture control. (Mandatory).** All framed walls, floors and ceilings not ventilated to allow moisture to escape shall be provided with an approved vapor retarder having a permeance rating of 1 perm (5.7×10^{-11} kg/Pa-s-m²) or less, when tested in accordance with the desiccant method using Procedure A of ASTM E 96. The vapor retarder shall be installed on the warm-in-winter side of the insulation.~~

Exceptions:

- ~~1. Buildings located in Climate Zones 1 through 3 as indicated in Figure 301.1 and Table 301.1.~~
- ~~2. In construction where moisture or its freezing will not damage the materials.~~
- ~~3. Where other approved means to avoid condensation in unventilated framed wall, floor, roof and ceiling cavities are provided.~~

502.5 Vapor retarders. Class I or II vapor retarders are required on the interior side of walls in zones 5, 6, 7, 8 and Marine 4.

Exceptions:

1. Basement walls.
2. Below grade portion of any wall.
3. Construction where moisture or its freezing will not damage the materials.

5. Add new text as follows:

502.5.1 Class III vapor retarders. Class III vapor retarders shall be permitted where the conditions in Table 502.5.1 are met.

TABLE 502.5.1
CLASS III VAPOR RETARDERS

<u>Zone</u>	<u>Class III vapor retarders permitted for:</u>
<u>Marine 4</u>	<u>Vented cladding over OSB</u> <u>Vented cladding over Plywood</u> <u>Vented cladding over Fiberboard</u> <u>Vented cladding over Gypsum</u> <u>Insulated sheathing with R-value ≥ 2.5 in 2x4 wall</u> <u>Insulated sheathing with R-value ≥ 3.75 in 2x6 wall</u>
<u>5</u>	<u>Vented cladding over OSB</u> <u>Vented cladding over Plywood</u> <u>Vented cladding over Fiberboard</u> <u>Vented cladding over Gypsum</u> <u>Insulated sheathing with R-value ≥ 5 in 2x4 wall</u> <u>Insulated sheathing with R-value ≥ 7.5 in 2x6 wall</u>
<u>6</u>	<u>Vented cladding over Fiberboard</u> <u>Vented cladding over Gypsum</u> <u>Insulated sheathing with R-value ≥ 7.5 in 2x4 wall</u> <u>Insulated sheathing with R-value ≥ 11.25 in 2x6 wall</u>
<u>7 and 8</u>	<u>Insulated sheathing with R-value ≥ 10 in 2x4 wall</u> <u>Insulated sheathing with R-value ≥ 15 in 2x6 wall</u>

502.5.2 Material vapor retarder class. The vapor retarder class shall be based on the manufacturer's testing or a tested assembly.

The following shall be deemed to meet the class specified:

Class I: Sheet polyethylene, non-perforated aluminum foil

Class II: Kraft faced fiberglass batts

Class III: Latex paint

Class IV: House wrap, building paper.

502.5.3 Minimum clear air spaces and vented openings. For the purposes of this section vented shall include the following minimum clear air spaces. Other openings with the equivalent net free area shall be permitted.

1. Stucco with a 3/8 inch clear airspace with 3/8 inch continuous slot vent openings at the top and bottom of each wall.
2. Brick with a 2 inch clear airspace behind the brick with vents at both the top and bottom of the brick. The vents shall be 3/8 inch x 2.5 inch openings every third brick at both the bottom and top course of each wall.
3. Stone or Masonry Veneer with a 2 inch clear airspace behind the stone with vents at the top and bottom. The vents shall have at least 1 square inch of vent area for every 24 inches of wall.
4. Panel Siding with 3/8 inch clear airspace with 3/8 inch continuous slot vent openings at both the top and bottom of each wall.
5. Wood, Wood Based, or Fiber Cement Siding with either a 1/4 inch clear airspace; or alternatively a 1/4 inch gap between the horizontal siding laps.
6. Other approved clear air spaces and vented openings.

PART II – IRC

1. Revise as follows:

SECTION R202 GENERAL DEFINITIONS

UNUSUALLY TIGHT CONSTRUCTION. Construction in which:

- Walls and ceilings comprising the building thermal envelope have a continuous ~~water~~ Class I or II vapor retarder ~~with a rating of 1 perm (5.7 x E10-11 kg/Pa⁻¹ E s⁻¹ E m²) or less~~ with openings therein gasketed or sealed.
- Storm windows or weatherstripping is applied around the threshold and jambs of opaque doors and openable windows.
- Caulking or sealants are applied to areas such as joints around window and door frames between sole plates and floors, between wall-ceiling joints, between wall panels, at penetrations for plumbing, electrical and gas lines, and at other openings.

2. Delete and substitute as follows:

~~**VAPOR RETARDER.** A vapor resistant material, membrane or covering such as foil, plastic sheeting, or insulation facing having a permeance rating of 1 perm (5.7 X 10-11 kg/Pa⁻¹ E s⁻¹ Em2) or less when tested in accordance with the dessicant method using Procedure A of ASTM E 96. Vapor retarders limit the amount of moisture vapor that passes through a material or wall assembly.~~

~~**VAPOR RETARDER CLASS.** A measure of a material or assembly's ability to limit the amount of moisture that passes through that material or assembly. Vapor retarder class shall be defined using the desiccant method of ASTM E-96 as follows:~~

~~Class I: 0.1 perm or less~~

~~Class II: 0.1 < perm >= 1.0 perm~~

~~Class III: 1.0 < perm >= 10 perm~~

~~Class IV: Greater than 10 perm~~

3. Delete without substitution:

SECTION R318 MOISTURE VAPOR RETARDERS

~~**R318.1 Moisture control.** In all framed walls, floors and roof/ceilings comprising elements of the building thermal envelope, a vapor retarder shall be installed on the warm-in-winter side of the insulation.~~

Exceptions:

1. ~~In construction where moisture or freezing will not damage the materials.~~
2. ~~Where the framed cavity or space is ventilated to allow moisture to escape.~~
3. ~~In counties identified as in climate zones 1 through 4 in Table N1101.2.~~

(Renumber subsequent sections)

4. Revise as follows:

R408.3 Unvented crawl space. Ventilation openings in under-floor spaces specified in Sections R408.1 and R408.2 shall not be required where:

1. Exposed earth is covered with a continuous Class I vapor retarder. Joints of the vapor retarder shall overlap by 6 inches (152 mm) and shall be sealed or taped. The edges of the vapor retarder shall extend at least 6 inches (152 mm) up the stem wall and shall be attached and sealed to the stem wall; and

R702.3.8 Water-resistant gypsum backing board. Gypsum board used as the base or backer for adhesive application of ceramic tile or other required nonabsorbent finish material shall conform to ASTM C 630 or C 1178. Use of water-resistant gypsum backing board shall be permitted on ceilings where framing spacing does not exceed 12 inches (305 mm) on center for 1/2-inch-thick (13 mm) or 16 inches (406 mm) for 5/8-inch-thick (16 mm) gypsum board. Water-resistant gypsum board shall not be installed over a Class I or II vapor retarder in a shower or tub compartment. Cut or exposed edges, including those at wall intersections, shall be sealed as recommended by the manufacturer.

R806.2 Minimum area. The total net free ventilating area shall not be less than 1/150 of the area of the space ventilated except that reduction of the total area to 1/300 is permitted, provided that at least 50 percent and not more than 80 percent of the required ventilating area is provided by ventilators located in the upper portion of the space to be ventilated at least 3 feet (914 mm) above the eave or cornice vents with the balance of the required ventilation provided by eave or cornice vents. As an alternative, the net free cross-ventilation area may be reduced to 1/300 when a Class I or II vapor barrier having a transmission rate not exceeding 1 perm ($5.7 \times 10^{-11} \text{ kg/Pa} \cdot \text{s} \cdot \text{m}^2$) is installed on the warm-in-winter side of the ceiling.

N1102.2.8 Crawl space walls. As an alternative to insulating floors over crawl spaces, crawl space walls shall be permitted to be insulated when the crawl space is not vented to the outside. Crawl space wall insulation shall be permanently fastened to the wall and extend downward from the floor to the finished grade level and then vertically and/or horizontally for at least an additional 24 inches (610 mm). Exposed earth in unvented crawl space foundations shall be covered with a continuous Class I vapor retarder. All joints of the vapor retarder shall overlap by 6 inches (153 mm) and be sealed or taped. The edges of the vapor retarder shall extend at least 6 inches (153 mm) up the stem wall and shall be attached to the stem wall.

5. Delete and substitute as follows:

~~**N1102.5 Moisture control.** The building design shall not create conditions of accelerated deterioration from moisture condensation. Above-grade frame walls, floors and ceilings not ventilated to allow moisture to escape shall be provided with an approved vapor retarder. The vapor retarder shall be installed on the warm-in-winter side of the thermal insulation.~~

Exceptions:

1. ~~In construction where moisture or its freezing will not damage the materials.~~
2. ~~Frame walls, floors and ceilings in jurisdictions in Zones 1, 2, 3, 4A, and 4B. (Crawl space floor vapor retarders are not exempted.)~~
3. ~~Where other approved means to avoid condensation are provided.~~

N1102.5 Vapor retarders. Class I or II vapor retarders are required on the interior side of walls in zones 5, 6, 7, 8 and Marine 4.

Exceptions:

1. Basement walls.
2. Below grade portion of any wall.
3. Construction where moisture or its freezing will not damage the materials.

6. Add new text as follows:

N1102.5.1 Class III vapor retarders. Class III vapor retarders shall be permitted where the conditions in Table N1102.5.1 are met.

**TABLE N1102.5.1
CLASS III VAPOR RETARDERS**

<u>Zone</u>	<u>Class III vapor retarders permitted for:</u>
<u>Marine 4</u>	<u>Vented cladding over OSB</u> <u>Vented cladding over Plywood</u> <u>Vented cladding over Fiberboard</u> <u>Vented cladding over Gypsum</u> <u>Insulated sheathing with R-value \geq 2.5 in 2x4 wall</u> <u>Insulated sheathing with R-value \geq 3.75 in 2x6 wall</u>
<u>5</u>	<u>Vented cladding over OSB</u> <u>Vented cladding over Plywood</u> <u>Vented cladding over Fiberboard</u> <u>Vented cladding over Gypsum</u> <u>Insulated sheathing with R-value \geq 5 in 2x4 wall</u> <u>Insulated sheathing with R-value \geq 7.5 in 2x6 wall</u>
<u>6</u>	<u>Vented cladding over Fiberboard</u> <u>Vented cladding over Gypsum</u> <u>Insulated sheathing with R-value \geq 7.5 in 2x4 wall</u> <u>Insulated sheathing with R-value \geq 11.25 in 2x6 wall</u>
<u>7 and 8</u>	<u>Insulated sheathing with R-value \geq 10 in 2x4 wall</u> <u>Insulated sheathing with R-value \geq 15 in 2x6 wall</u>

N1102.5.2 Material vapor retarder class. The vapor retarder class shall be based on the manufacturer’s testing or a tested assembly.

The following shall be deemed to meet the class specified:

- Class I: Sheet polyethylene, non-perforated aluminum foil
- Class II: Kraft faced fiberglass batts
- Class III: Latex paint
- Class IV: House wrap, building paper.

N1102.5.3 Minimum clear air spaces and vented openings. For the purposes of this section vented shall include the following minimum clear air spaces. Other openings with the equivalent net free area shall be permitted.

1. Stucco with a 3/8 inch clear airspace with 3/8 inch continuous slot vent openings at the top and bottom of each wall.
2. Brick with a 2 inch clear airspace behind the brick with vents at both the top and bottom of the brick. The vents shall be 3/8 inch x 2.5 inch openings every third brick at both the bottom and top course of each wall.
3. Stone or Masonry Veneer with a 2 inch clear airspace behind the stone with vents at the top and bottom. The vents shall have at least 1 square inch of vent area for every 24 inches of wall.
4. Panel Siding with 3/8 inch clear airspace with 3/8 inch continuous slot vent openings at both the top and bottom of each wall.
5. Wood, Wood Based, or Fiber Cement Siding with either a 1/4 inch clear airspace; or alternatively a 1/4 inch gap between the horizontal siding laps.
6. Other approved clear air spaces and vented openings.

PART III – IBC GENERAL

1. Delete and substitute as follows:

SECTION 202
GENERAL DEFINITIONS

VAPOR RETARDER. A vapor resistant material, membrane or covering such as foil, plastic sheeting, or insulation facing having a permeance rating of 1 perm ($5.7 \times 10^{-11} \text{ kg/Pa} \cdot \text{E} \cdot \text{s}^{-1} \cdot \text{m}^2$) or less when tested in accordance with the desiccant method using Procedure A of ASTM E 96. Vapor retarders limit the amount of moisture vapor that passes through a material or wall assembly.

VAPOR RETARDER CLASS. A measure of a material or assembly's ability to limit the amount of moisture that passes through that material or assembly. Vapor retarder class shall be defined using the desiccant method of ASTM E-96 as follows:

Class I: 0.1 perm or less

Class II: $0.1 < \text{perm} \leq 1.0$ perm

Class III: $1.0 < \text{perm} \leq 10$ perm

Class IV: Greater than 10 perm

2. Revise as follows:

1203.2 Attic spaces. Enclosed attics and enclosed rafter spaces formed where ceilings are applied directly to the underside of roof framing members shall have cross ventilation for each separate space by ventilating openings protected against the entrance of rain and snow. Blocking and bridging shall be arranged so as not to interfere with the movement of air. A minimum of 1 inch (25 mm) of airspace shall be provided between the insulation and the roof sheathing. The net free ventilating area shall not be less than 1/150 of the area of the space ventilated, with 50 percent of the required ventilating area provided by ventilators located in the upper portion of the space to be ventilated at least 3 feet (914 mm) above eave or cornice vents with the balance of the required ventilation provided by eave or cornice vents.

Exception: The minimum required net free ventilating area shall be 1/300 of the area of the space ventilated, provided a vapor retarder having a transmission rate not exceeding 1 perm in accordance with ASTM E 96 is installed on the warm side of the attic insulation and provided 50 percent of the required ventilating area provided by ventilators located in the upper portion of the space to be ventilated at least 3 feet (914 mm) above eave or cornice vents, with the balance of the required ventilation provided by eave or cornice vents.

1203.3.2 Exceptions. The following are exceptions to Sections 1203.3 and 1203.3.1:

1. Where warranted by climatic conditions, ventilation openings to the outdoors are not required if ventilation openings to the interior are provided.
2. The total area of ventilation openings is permitted to be reduced to 1/1,500 of the under-floor area where the ground surface is ~~treated~~ covered with an ~~approved~~ a Class I vapor retarder material and the required openings are placed so as to provide cross ventilation of the space. The installation of operable louvers shall not be prohibited.
3. Ventilation openings are not required where continuously operated mechanical ventilation is provided at a rate of 1.0 cubic foot per minute (cfm) for each 50 floor area and the ground surface is covered with an ~~approved~~ a Class I vapor retarder.
4. Ventilation openings are not required when the ground surface is covered with an ~~approved~~ a Class I vapor retarder, the perimeter walls are insulated and the space is conditioned in accordance with the *International Energy Conservation Code*.
5. For buildings in flood hazard areas as established in Section 1612.3, the openings for under-floor ventilation shall be deemed as meeting the flood opening requirements of ASCE 24 provided that the ventilation openings are designed and installed in accordance with ASCE 24.

PART IV – IBC FIRE SAFETY

1403.2 Weather protection. Exterior walls shall provide the building with a weather-resistant exterior wall envelope. The exterior wall envelope shall include flashing, as described in Section 1405.3. The exterior wall envelope shall be designed and constructed in such a manner as to prevent the accumulation of water within the wall assembly by

providing a water-resistive barrier behind the exterior veneer, as described in Section 1404.2, and a means for draining water that enters the assembly to the exterior. ~~Protection against condensation in the exterior wall assembly shall be provided in accordance with the *International Energy Conservation Code*.~~

Exceptions:

1. A weather-resistant exterior wall envelope shall not be required over concrete or masonry walls designed in accordance with Chapters 19 and 21, respectively.
2. Compliance with the requirements for a means of drainage, and the requirements of Sections 1404.2 and 1405.3, shall not be required for an exterior wall envelope that has been demonstrated through testing to resist wind-driven rain, including joints, penetrations and intersections with dissimilar materials, in accordance with ASTM E 331 under the following conditions:
 - 2.1. Exterior wall envelope test assemblies shall include at least one opening, one control joint, one wall/eave interface and one wall sill. All tested openings and penetrations shall be representative of the intended end-use configuration.
 - 2.2. Exterior wall envelope test assemblies shall be at least 4 feet by 8 feet (1219 mm by 2438 mm) in size.
 - 2.3. Exterior wall envelope assemblies shall be tested at a minimum differential pressure of 6.24 pounds per square foot (psf) (0.297 kN/m²).
 - 2.4. Exterior wall envelope assemblies shall be subjected to a minimum test exposure duration of 2 hours.

The exterior wall envelope design shall be considered to resist wind-driven rain where the results of testing indicate that water did not penetrate control joints in the exterior wall envelope, joints at the perimeter of openings or intersections of terminations with dissimilar materials.

PART V – IBC STRUCTURAL

1910.1 General. The thickness of concrete floor slabs supported directly on the ground shall not be less than 31/2 inches (89 mm). A 6-mil (0.006 inch; 0.15 mm) polyethylene Class I vapor retarder with joints lapped not less than 6 inches (152 mm) shall be placed between the base course or subgrade and the concrete floor slab, or other approved equivalent methods or materials shall be used to retard vapor transmission through the floor slab.

Exception: A No vapor retarder is ~~not~~ required:

1. For detached structures accessory to occupancies in Group R-3, such as garages, utility buildings or other unheated facilities.
2. For unheated storage rooms having an area of less than 70 square feet (6.5 m²) and carports attached to occupancies in Group R-3.
3. For buildings of other occupancies where migration of moisture through the slab from below will not be detrimental to the intended occupancy of the building.
4. For driveways, walks, patios and other flatwork which will not be enclosed at a later date.
5. Where approved based on local site conditions.

2509.3 Limitations. Water-resistant gypsum backing board shall not be used in the following locations:

1. Over a Class I or II vapor retarder in shower or bathtub compartments.
2. Where there will be direct exposure to water or in areas subject to continuous high humidity.
3. On ceilings where frame spacing exceeds 12 inches (305 mm) o.c. for 1/2-inch-thick (12.7 mm) water-resistant

2510.6 Water-resistive barriers. Water-resistive barriers shall be installed as required in Section 1404.2 and, where applied over wood-based sheathing, shall include a water-resistive Class III or IV vapor ~~permeable barrier~~ retarder with a performance at least equivalent to two layers of Grade D paper.

Exception: Where the water-resistive barrier that is applied over wood-based sheathing has a water resistance equal to or greater than that of 60-minute Grade D paper and is separated from the stucco by an intervening, substantially nonwater-absorbing layer or drainage space.

PART VI – IMC**1. Revise as follows:****SECTION 202
GENERAL DEFINITIONS****UNUSUALLY TIGHT CONSTRUCTION.** Construction in which:

1. Walls and ceilings comprising the building thermal envelope have a continuous ~~water~~ Class I or II vapor retarder ~~with a rating of 1 perm ($5.7 \times 10^{-11} \text{ kg/Pa} \cdot \text{s} \cdot \text{E} \cdot \text{m}^2$) or less~~ with openings therein gasketed or sealed.
2. Storm windows or weatherstripping is applied around the threshold and jambs of opaque doors and openable windows.
3. Caulking or sealants are applied to areas such as joints around window and door frames between sole plates and floors, between wall-ceiling joints, between wall panels, at penetrations for plumbing, electrical and gas lines, and at other openings.

Reason: Wall assemblies can be designed and constructed to dry inwards, outwards and to both sides in all climate zones. Requiring vapor barriers and vapor retarders to always be installed on the interior of wall assemblies inhibits the use of wall designs that promote inward drying thereby increasing the risk of mold and moisture damage. This code change allows more flexibility in the design and construction of moisture forgiving wall systems.

These requirements for vapor retarder have been in the development process for at least 4 years. That process has included two Building America meetings, coordination with personnel at the Oakridge National Laboratory and the University of Waterloo, presentations before ASHRAE committees, and interactions with private companies.

These requirements recognize that many common materials function to various degrees to slow the passage of moisture. In many situations common materials such as the kraft facing on a fiberglass batt, or latex paint may serve to retard moisture sufficiently. In particular, the “standard” sheet of polyethylene is usually not required as a vapor retarder in walls.

This change includes modification of existing vapor retarder requirements and instances in the code to use the vapor retarder classes proposed here.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Note: The following analysis was not in the Code Change Proposal book but was published in the AErrata to the 2006/2007 Proposed Changes to the International Codes and Analysis of Proposed Reference Standards® provided at the code development hearings:

Analysis: Review of proposed new standard indicated that, in the opinion of ICC Staff, the standard did not comply with ICC standards criteria.

PART I C IECC**Committee Action:****Approved as Modified****Modify the proposal as follows:**

VAPOR RETARDER CLASS. A measure of a material or assembly's ability to limit the amount of moisture that passes through that material or assembly. Vapor retarder class shall be defined using the desiccant method with Procedure A of ASTM E-96 as follows:

- Class I: 0.1 perm or less
- Class II: $0.1 < \text{perm} \leq 1.0$ perm
- Class III: $1.0 < \text{perm} \leq 10$ perm
- ~~Class IV: Greater than 10 perm~~

402.5 Vapor retarders. Class I or II vapor retarders are required on the interior side of frame walls in zones 5, 6, 7, 8 and Marine 4.

Exceptions:

1. Basement walls.
2. Below grade portion of any wall.
3. Construction where moisture or its freezing will not damage the materials.

402.5.2 Material vapor retarder class. The vapor retarder class shall be based on the manufacturer's certified testing or a tested assembly. The following shall be deemed to meet the class specified:

- Class I: Sheet polyethylene, non-perforated aluminum foil
- Class II: Kraft faced fiberglass batts
- Class III: Latex paint
- ~~Class IV: House wrap, building paper.~~

CODE CHANGES RESOURCE COLLECTION – INTERNATIONAL BUILDING CODE

402.5.3 Minimum clear air spaces and vented openings for vented cladding. For the purposes of this section vented cladding shall include the following minimum clear air spaces. Other openings with the equivalent ~~net free~~ vent area shall be permitted.

1. Stucco with a 3/8 inch clear airspace with 3/8 inch continuous slot vent openings at the top and bottom of each wall.
 2. Brick with a 2 inch clear airspace behind the brick with vents at both the top and bottom of the brick. The vents shall be 3/8 inch x 2.5 inch openings every third brick at both the bottom and top course of each wall.
 3. Stone or Masonry Veneer with a 2 inch clear airspace behind the stone with vents at the top and bottom. The vents shall have at least 1 square inch of vent area for every 24 inches of wall.
 4. Panel Siding with 3/8 inch clear airspace with 3/8 inch continuous slot vent openings at both the top and bottom of each wall.
 5. Wood, Wood Based, or Fiber Cement Siding with either a 1/4 inch clear airspace; or alternatively a 1/4 inch gap between the horizontal siding laps
 6. Vinyl lap siding applied directly to a weather resistive barrier.
 7. Manufactured Stone Veneer with a 3/8 inch clear airspace with 3/8 inch continuous slot vent openings at both the top and bottom of each wall.
6. 8. Other approved clear air spaces and vented openings.

(Portions of proposal not shown remain unchanged)

Committee Reason: The proposed change introduces advances in technology related to vapor retarders, and provides for more flexibility in exterior wall design. The proposal moves the code forward from the Aone size fits all® approach that is presently in the code, while at the same time not eliminating any construction that was previously done using the present code. The modification eliminates reference to Class IV, as it is not used in the I-codes anywhere. In addition, the modification adds exceptions regarding clear air space that enable construction of common applications without change to the standard methods for installing vinyl siding and manufactured stone veneer.

Assembly Action:

None

PART II C IRC

Committee Action:

Disapproved

Committee Reason: The proposed new text, Section N1102.5.3, is confusing, unclear and belongs in the wall covering chapter. The committee likes this concept and this is needed in the code. However, this is a much larger problem and this proposal does not fully solve it. The proponent should work with industry and more research and development is needed in order to find the proper solution.

Assembly Action:

None

PART III C IBC GENERAL

Committee Action:

Disapproved

Committee Reason: The committee disapproved the proposal primarily because as proposed the provisions requiring net free ventilating area of not less than 1/150 would never apply. Committee members support deleting the exception in its entirety and revising the main section to use 1/300 instead of 1/150. It should also be noted that the committee felt the proponents proposed modification to the new definition of VAPOR RETARDER CLASS to delete Class IV was appropriate.

Assembly Action:

None

PART IV C IBC FIRE SAFETY

Committee Action:

Disapproved

Committee Reason: The committee preferred the approach of FS171-06/07. Instead of simply deleting the reference, the committee preferred to have the provisions brought into the code. That approach will help to provide the requirements within the code so that they are known. See committee reason statement for FS171-06/07.

Assembly Action:

None

PART V C IBC STRUCTURAL

Committee Action:

Disapproved

Committee Reason: There was some concern with maintaining the integrity of the vapor retarder under concrete slabs on grade. Also it was unclear whether the 6-mil polyethylene vapor retarder is in fact a class 1 vapor retarder as this proposal would require. Most of this information belongs in the commentary rather than the code.

Assembly Action:

None

PART VI C IMC

Committee Action:

Disapproved

Committee Reason: The definition proposed to be revised was deleted by the action taken on M108-06/07.

Assembly Action:

None

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because public comments were submitted for Part I (IECC).

Public Comment 2:

Joseph Lstiburek, Building Science Corporation, representing himself, requests Approval as Modified by this Public Comment for Part I.

Further modify proposal as follows:

402.5.1 Class III vapor retarders. Class III vapor retarders shall be permitted where any one of the conditions in Table 402.5.1 are met.

**TABLE 402.5.1
CLASS III VAPOR RETARDERS**

Zone	Class III vapor retarders permitted for:
Marine 4	Vented cladding over OSB Vented cladding over Plywood Vented cladding over Fiberboard Vented cladding over Gypsum Insulated sheathing with R-value \geq <u>R2.5 in-over</u> 2x4 wall Insulated sheathing with R-value \geq <u>R3.75 in-over</u> 2x6 wall
5	Vented cladding over OSB Vented cladding over Plywood Vented cladding over Fiberboard Vented cladding over Gypsum Insulated sheathing with R-value \geq <u>R5 in-over</u> 2x4 wall Insulated sheathing with R-value \geq <u>R7.5 in-over</u> 2x6 wall
6	Vented cladding over Fiberboard Vented cladding over Gypsum Insulated sheathing with R-value \geq <u>R7.5 in-over</u> 2x4 wall Insulated sheathing with R-value \geq <u>R11.25 in-over</u> 2x6 wall
7 and 8	Insulated sheathing with R-value \geq <u>R10 in-over</u> 2x4 wall Insulated sheathing with R-value \geq <u>R15 in-over</u> 2x6 wall

402.5.2 Material vapor retarder class. The vapor retarder class shall be based on the manufacturer's certified testing or a tested assembly. The following shall be deemed to meet the class specified:

- Class I: Sheet polyethylene, non-perforated aluminum foil
- Class II: Kraft faced fiberglass batts or low perm paint (paint with $0.1 < \text{perm} \leq 1.0$)
- Class III: Latex or enamel paint

402.5.3 Minimum clear air spaces and vented openings for vented cladding. For the purposes of this section vented cladding shall include the following minimum clear air spaces. Other openings with the equivalent vent area shall be permitted.

- ~~1. Stucco with a 3/8 inch clear airspace with 3/8 inch continuous slot vent openings at the top and bottom of each wall.~~
- ~~2. Brick with a 2 inch clear airspace behind the brick with vents at both the top and bottom of the brick. The vents shall be 3/8 inch x 2.5 inch openings every third brick at both the bottom and top course of each wall.~~
- ~~3. Stone or Masonry Veneer with a 2 inch clear airspace behind the stone with vents at the top and bottom. The vents shall have at least 1 square inch of vent area for every 24 inches of wall.~~
- ~~4. Panel Siding with 3/8 inch clear airspace with 3/8 inch continuous slot vent openings at both the top and bottom of each wall.~~
- ~~5. Wood, Wood Based, or Fiber Cement Siding with either a 1/4 inch clear airspace; or alternatively a 1/4 inch gap between the horizontal siding laps.~~
6. 1. Vinyl lap or horizontal aluminum siding applied directly to over a weather resistive barrier as specified in IRC Table R703.4.
2. Brick veneer with a clear airspace as specified in IRC Section R703.7.4.2.
- ~~7. Manufactured Stone Veneer with a 3/8 inch clear airspace with 3/8 inch continuous slot vent openings at both the top and bottom of each wall.~~
8. 3. Other approved vented claddings clear air spaces and vented openings.

502.5.1 Class III vapor retarders. Class III vapor retarders shall be permitted where any one of the conditions in Table 402.5.1 are met.

TABLE 502.5.1
CLASS III VAPOR RETARDERS

Zone	Class III vapor retarders permitted for:
Marine 4	Vented cladding over OSB Vented cladding over Plywood Vented cladding over Fiberboard Vented cladding over Gypsum Insulated sheathing with R-value \geq <u>R2.5 in-over</u> 2x4 wall Insulated sheathing with R-value \geq <u>R3.75 in-over</u> 2x6 wall
5	Vented cladding over OSB Vented cladding over Plywood Vented cladding over Fiberboard Vented cladding over Gypsum Insulated sheathing with R-value \geq <u>R5 in-over</u> 2x4 wall Insulated sheathing with R-value \geq <u>R7.5 in-over</u> 2x6 wall
6	Vented cladding over Fiberboard Vented cladding over Gypsum Insulated sheathing with R-value \geq <u>R7.5 in-over</u> 2x4 wall Insulated sheathing with R-value \geq <u>R11.25 in-over</u> 2x6 wall
7 and 8	Insulated sheathing with R-value \geq <u>R10 in-over</u> 2x4 wall Insulated sheathing with R-value \geq <u>R15 in-over</u> 2x6 wall

502.5.2 Material vapor retarder class. The vapor retarder class shall be based on the manufacturer's certified testing or a tested assembly. The following shall be deemed to meet the class specified:

- Class I: Sheet polyethylene, non-perforated aluminum foil
- Class II: Kraft faced fiberglass batts or low perm paint (paint with $0.1 < \text{perm} \leq 1.0$)
- Class III: Latex or enamel paint

502.5.3 Minimum clear air spaces and vented openings for vented cladding. For the purposes of this section vented cladding shall include the following minimum clear air spaces. Other openings with the equivalent vent area shall be permitted.

- ~~1. Stucco with a 3/8 inch clear airspace with 3/8 inch continuous slot vent openings at the top and bottom of each wall.~~
- ~~2. Brick with a 2 inch clear airspace behind the brick with vents at both the top and bottom of the brick. The vents shall be 3/8 inch x 2.5 inch openings every third brick at both the bottom and top course of each wall.~~
- ~~3. Stone or Masonry Veneer with a 2 inch clear airspace behind the stone with vents at the top and bottom. The vents shall have at least 1 square inch of vent area for every 24 inches of wall.~~
- ~~4. Panel Siding with 3/8 inch clear airspace with 3/8 inch continuous slot vent openings at both the top and bottom of each wall.~~
- ~~5. Wood, Wood Based, or Fiber Cement Siding with either a 1/4 inch clear airspace; or alternatively a 1/4 inch gap between the horizontal siding laps~~
6. 1. Vinyl lap or horizontal aluminum siding applied directly to over a weather resistive barrier as specified in IRC Table R703.4.
2. Brick veneer with a clear airspace as specified in IRC Section R703.7.4.2.
~~7. Manufactured Stone Veneer with a 3/8 inch clear airspace with 3/8 inch continuous slot vent openings at both the top and bottom of each wall.~~
8. 3. Other approved vented claddings clear air spaces and vented openings.

(Portions of proposal not shown remain unchanged)

Commenter's Reason: This change updates the vapor retarder requirements to allow more design flexibility and better reflect current methods of construction. This change allows wall assemblies to be constructed to dry inwards, outwards, or to both sides in all climate zones. This change also recognizes that all construction materials have greater or lesser vapor retarding characteristics themselves. The results of a dialogue on vapor retarders that has occurred over four years with a wide range of interested parties are incorporated in the code text proposed here.

Part I (IECC): Part I is the largest part of the change, affecting both the residential and commercial requirements. The IECC committee, with modifications, approved it. This public comment updates the change already approved, primarily to meet deal with concerns expressed by home builders. The most important modification since the first hearing is in the descriptions of the vented openings (IECC Sections 402.5.3 and 502.5.3).

Parts IV, V and VI. No public comments were filed on these three parts. Either the parts of the code they modified were removed by other code changes or further discussion with interested parties showed them to be unnecessary.

This item is on the agenda for individual consideration because public comments were submitted for Part II (IRC).

Public Comment 1:

Joseph Lstiburek, Building Science Corporation, representing himself, requests Approval as Modified by this public comment for Part II.

Modify Part II of proposal as follows:

VAPOR RETARDER CLASS. A measure of a material or assembly's ability to limit the amount of moisture that passes through that material or assembly. Vapor retarder class shall be defined using the desiccant method of ASTM E-96 as follows:

Class I: 0.1 perm or less
 Class II: 0.1 < perm >= 1.0 perm
 Class III: 1.0 < perm >= 10 perm
 Class IV: ~~Greater than 10 perm~~

N1102.5 Vapor Retarders. Class I or II vapor retarders are required on the interior side of frame walls in zones 5, 6, 7, 8 and Marine 4.

Exceptions:

1. Basement walls.
2. Below grade portion of any wall.
3. Construction where moisture or its freezing will not damage the materials.

N1102.5.1 Class III vapor retarders. Class III vapor retarders shall be permitted where any one of the conditions in Table N1102.5.1 are met.

**TABLE N1102.5.1
 CLASS III VAPOR RETARDERS**

Zone	Class III vapor retarders permitted for:
Marine 4	Vented cladding over OSB Vented cladding over Plywood Vented cladding over Fiberboard Vented cladding over Gypsum Insulated sheathing with R-value >= 2.5 in over 2x4 wall Insulated sheathing with R-value >= 3.75 in over 2x6 wall
5	Vented cladding over OSB Vented cladding over Plywood Vented cladding over Fiberboard Vented cladding over Gypsum Insulated sheathing with R-value >= 5 in over 2x4 wall Insulated sheathing with R-value >= 7.5 in over 2x6 wall
6	Vented cladding over Fiberboard Vented cladding over Gypsum Insulated sheathing with R-value >= 7.5 in over 2x4 wall Insulated sheathing with R-value >= 11.25 in over 2x6 wall
7 and 8	Insulated sheathing with R-value >= 10 in over 2x4 wall Insulated sheathing with R-value >= 15 in over 2x6 wall

N1102.5.2 Material vapor retarder class. The vapor retarder class shall be based on the manufacturer's certified testing or a tested assembly.

The following shall be deemed to meet the class specified:

Class I: Sheet polyethylene, non-perforated aluminum foil
 Class II: Kraft faced fiberglass batts
 Class III: Latex paint
 Class IV: ~~House wrap, building paper.~~

N1102.5.3 Minimum clear air spaces and vented openings for vented cladding. For the purposes of this section vented cladding shall include the following minimum clear air spaces. Other openings with the equivalent net-free vent area shall be permitted.

- ~~1. Stucco with a 3/8 inch clear airspace with 3/8 inch continuous slot vent openings at the top and bottom of each wall.~~
 - ~~2. Brick with a 2 inch clear airspace behind the brick with vents at both the top and bottom of the brick. The vents shall be 3/8 inch x 2.5 inch openings every third brick at both the bottom and top course of each wall.~~
 - ~~3. Stone or Masonry Veneer with a 2 inch clear airspace behind the stone with vents at the top and bottom. The vents shall have at least 1 square inch of vent area for every 24 inches of wall.~~
 - ~~4. Panel Siding with 3/8 inch clear airspace with 3/8 inch continuous slot vent openings at both the top and bottom of each wall.~~
 - ~~5. Wood, Wood Based, or Fiber Cement Siding with either a 1/4 inch clear airspace; or alternatively a 1/4 inch gap between the horizontal siding laps~~
 - ~~6. Other approved clear air spaces and vented openings.~~
1. Vinyl lap or horizontal aluminum siding applied over a weather resistive barrier as specified in IRC Table R703.4.
 2. Brick veneer with a clear airspace as specified in IRC Section R703.7.4.2.
 3. Other approved vented claddings.

(Portions of proposal not shown remain unchanged)

Commenter-s Reason: This change updates the vapor retarder requirements to allow more design flexibility and better reflect current methods of construction. This change allows wall assemblies to be constructed to dry inwards, outwards, or to both sides in all climate zones. This change also recognizes that all construction materials have greater or lesser vapor retarding characteristics themselves. The results of a dialogue on vapor retarders that has occurred over four years with a wide range of interested parties are incorporated in the code text proposed here.

Part II (IRC): Part II is for the IRC, including all modifications already approved in the IECC (Part I). Several portions of the code are updated to use the new vapor retarder class definitions.

Parts IV, V and VI. No public comments were filed on these three parts. Either the parts of the code they modified were removed by other code changes or further discussion with interested parties showed them to be unnecessary.

This item is on the agenda for individual consideration because a public comment was submitted for Part III.

Public Comment:

Joseph Lstiburek, Building Science Corporation, representing himself, requests Approval as Modified by this Public Comment for Part III.

Modify Part III of proposal as follows:

VAPOR RETARDER CLASS. A measure of a material or assembly's ability to limit the amount of moisture that passes through that material or assembly. Vapor retarder class shall be defined using the desiccant method of ASTM E-96 as follows:

- Class I: 0.1 perm or less
- Class II: 0.1 < perm >= 1.0 perm
- Class III: 1.0 < perm >= 10 perm
- ~~Class IV: Greater than 10 perm~~

1203.2 Attic spaces. Enclosed attics and enclosed rafter spaces formed where ceilings are applied directly to the underside of roof framing members shall have cross ventilation for each separate space by ventilating openings protected against the entrance of rain and snow. Blocking and bridging shall be arranged so as not to interfere with the movement of air. A minimum of 1 inch (25 mm) of airspace shall be provided between the insulation and the roof sheathing. The net free ventilating area shall not be less than ~~4/50~~ 1/300 of the area of the space ventilated, with 50 percent of the required ventilating area provided by ventilators located in the upper portion of the space to be ventilated at least 3 feet (914 mm) above eave or cornice vents with the balance of the required ventilation provided by eave or cornice vents.

~~**Exception:** The minimum required not free ventilating area shall be 1/300 of the area of the space ventilated provided 50 percent of the required ventilating area provided by ventilators located in the upper portion of the space to be ventilated at least 3 feet (914 mm) above eave or cornice vents, with the balance of the required ventilation provided by eave or cornice vents.~~

(Portions of proposal not shown remain unchanged)

Commenter's Reason: This change updates the vapor retarder requirements to allow more design flexibility and better reflect current methods of construction. This change allows wall assemblies to be constructed to dry inwards, outwards, or to both sides in all climate zones. This change also recognizes that all construction materials have greater or lesser vapor retarding characteristics themselves. The results of a dialogue on vapor retarders that has occurred over four years with a wide range of interested parties are incorporated in the code text proposed here.

Part III (IBC). Part III revises the IBC vapor retarder requirements to be consistent with the commercial requirements in the IECC. It updates the use of the term "vapor retarder" to use the new vapor retarder class definitions. It also removes a redundant exception, as suggested by the committee.

Parts IV, V and VI. No public comments were filed on these three parts. Either the parts of the code they modified were removed by other code changes or further discussion with interested parties showed them to be unnecessary.

Final Hearing Results

EC28-06/07, Part I	AMPC2
EC28-06/07, Part II	AMPC1
EC28-06/07, Part III	AMPC1
EC28-06/07, Part IV	D
EC28-06/07, Part V	D
EC28-06/07, Part VI	D

2006 INTERNATIONAL FIRE CODE

Code Change No: **F40-06/07**

Original Proposal

Sections: 505.1 (IBC [F] 501.2); IRC R321.1

Proponent: Paul Hayward, City of Farmington, UT, representing Bonneville Chapter ICC

PART I – IFC (IBC)

Delete and substitute as follows:

505.1 Address numbers. ~~New and existing buildings shall have approved address numbers, building numbers or approved building identification placed in a position that is plainly legible and visible from the street or road fronting the property. These numbers shall contrast with their background. Address numbers shall be Arabic numerals or alphabet letters. Numbers shall be a minimum of 4 inches (102 mm) high with a minimum stroke width of 0.5 inch (12.7 mm).~~

505.1 Address identification. New and existing buildings shall be provided with approved address numbers or letters. Each character shall be a minimum 4 inches (102 mm) high and a minimum of 0.5 inch (12.7 mm) wide. They shall be installed on a contrasting background and be plainly visible from the street or road fronting the property. Where access is by means of a private road and the building address cannot be viewed from the public way, a monument, pole or other approved sign or means shall be used to identify the structure.

PART I – IRC

Delete and substitute as follows:

PART II – IRC

R321.1 Premises identification. ~~Approved numbers or addresses shall be provided for all new buildings in such a position as to be plainly visible and legible from the street or road fronting the property.~~

R321.1 Address identification. New buildings shall be provided with approved address numbers or letters. Each character shall be a minimum 4 inches (102 mm) high and a minimum of 0.5 inch (12.7 mm) wide. They shall be installed on a contrasting background and be plainly visible from the street or road fronting the property. Where access is by means of a private road and the building address cannot be viewed from the public way, a monument, pole or other approved sign or means shall be used to identify the structure.

Reason: The purpose of this change is to provide consistency among the International Building, Fire and Residential Codes. All three codes have different requirements regarding this regulation. Identifying buildings during an emergency is greatly aided by the proper placement of address identification. In emergencies, seconds may mean the difference between life and death. In other than emergencies, convenience for persons attempting to locate a business, residence, public agency or other would seem to be a minimum requirement for a building. Sometimes one just can't locate a place without it being identified.

Many jurisdictions have ordinances requiring identification. The requirement is not consistent, nor is it uniform. Some federal agencies require identification on the mail box, but when that is located at the end of a private lane, with several structures located along the lane, it is impossible to determine the correct building from the group of mail boxes. When using mutual aid, emergency responders are at a distinct disadvantage. Their response becomes a true matter of life-safety. Some of the elements of this proposal have been submitted in prior cycles. It has gone before different committees and been rejected for a variety of reasons. A consequence of that action has resulted in an effort to have the proposed wording identical in all three codes. Additionally, provisions not previously considered, such as the height requirement, will now be uniform. Past committee objections have sometimes centered on wording that was not proposed for change, but was to remain as existing text, making the proponent wonder why it was not approved. In order to avoid a similar outcome, this is now a comprehensive approach to repair and maintain a very important requirement, but make it the same in all three codes. This will make it easier for users of the code and provide safety and consistency.

Bibliography: Please see G81-04/05

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

**PART I – IFC (IBC)
Committee Action:**

Disapproved

Committee Reason: The proposal would delete the current “approved building identification” text that provides enforcement flexibility. The intent of the last sentence of the proposed text is unclear. The proposal should also deal with multiple buildings and common driveways for multiple buildings.

Assembly Action:

None

PART II – IRC

Committee Action:

Disapproved

Committee Reason: There was no evidence brought forward to justify the code change proposal. It is important to preserve the consistency that currently exists between the IFC and the IRC as it relates to address identification and the size of the lettering.

Assembly Action:

None

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because public comments were submitted for Parts I and II.

Public Comment:

Paul Hayward, Farmington City, Utah, representing Bonneville Chapter ICC, requests Approval as Modified by this public comment for Part I.

Replace proposal with the following:

505.1 Address numbers. New and existing buildings shall have approved address numbers, building numbers or approved building identification placed in a position that is plainly legible and visible from the street or road fronting the property. These numbers shall contrast with their background. Address numbers shall be Arabic numbers or alphabetical letters. Numbers shall be a minimum of 4 inches high with a minimum stroke width of 0.5 inch (12.7mm). Where access is by means of a private road and the building cannot be viewed from the public way, a monument, pole or other sign or means shall be used to identify the structure.

Commenter’s Reason: The Committee had several objections to the original proposal. Those concerns have been addressed by retreating back to the original language in the existing IFC and IBC and simply adding the last sentence. There is a problem with buildings that have address numbers that cannot be seen from the public way. Section 505.2 in the Fire Code requires street signs to assist emergency personnel when responding to an address. This simply says that if the building cannot be seen from the public way then another identification means should be employed so that the building may be found.

Some of the discussion at the hearing centered around such things as a PUD or a grouping of university buildings. It is possible to post a site map at the entrance of a PUD, similar to the map the US Forrest Service uses at campground, and most universities have some form of building identification for visitors or new faculty, staff and students. There doesn’t seem to be a problem with such an approach.

Previous proposals had a requirement that the signs could not be adversely affected by weather. A fire service person objected, stating that there was NO PROBLEM with any of the rest of the proposal (about 3 cycles back). That provision was removed from the subsequent proposals. *If you read carefully the reason given in Part II you will see that there were inconsistent provisions between the three codes---IFC, IBC and IRC.* Since the code sections to the IFC and IBC are now considered by only one committee, some of the reason for the change has disappeared (size consistency), but the reasons for the last sentence still remain.

The problem comes when a building is remote and hidden from view ad there is NO means to identify its location. That’s all; very simple, straight forward and a common sense approach to safety.

PLEASE APPROVE this common sense proposal. It will assist the fire service as well as many others.

This item is on the agenda for individual consideration because public comments were submitted for Part II.

Public Comment 2:

Paul Hayward, Farmington City, Utah, representing Bonneville Chapter ICC, requests Approval as Modified by this public comment for Part II.

Replace proposal with the following:

R321.1 Address numbers. Buildings shall have approved address numbers, building numbers or approved building identification placed in a position that is plainly legible and visible from the street or road fronting the property. These numbers shall contrast with their background. Address numbers shall be Arabic numbers or alphabetical letters. Numbers shall be a minimum of 4 inches high with a minimum stroke width of 0.5 inch (12.7mm). Where access is by means of a private road and the building cannot be viewed from the public way, a monument, pole or other sign or means shall be used to identify the structure.

Commenter's Reason: See F40-06/07 Part I for the reason to add the last sentence. Also, this is a very big problem in rural areas where a row of mail boxes identifies all the house-holds on a rural postal route, but gives no clue as to where any one dwelling is located. It's difficult to provide emergency services at the end of the lane next to the mail boxes. Additionally, some folks just want to tack up a piece of cardboard on a tree. The address identification should be a minimum size, stroke, and contrasting color so that it provides the safety contemplated by the code and that is best accomplished by this change.

The fact it must be approved should not provide heartburn to anyone, since that language is already contained in the current and proposed text of the code. This tool will definitely help those seeking to find a remote dwelling, especially in emergencies, when all they have is an address.

If the proposal to Part I is approved, then this change needs to be approved also to promote true consistency.

Final Hearing Results

F40-06/07, Part I

AMPC1

F40-06/07, Part II

AMPC2

Code Change No: F43-06/07

Original Proposal

Section: 509.1 (IBC [F] 911.1)

Proponent: Ed Donoghue, Edward A. Donoghue Associates, Inc., representing National Elevator Industry, Inc.

Revise as follows:

509.1 Features. Where required by other sections of this code and in all buildings classified as high-rise buildings by the *International Building Code*, a fire command center for fire department operations shall be provided. The location and accessibility of the fire command center shall be approved by the fire department. The fire command center shall be separated from the remainder of the building by not less than a 1-hour fire barrier constructed in accordance with Section 706 of the *International Building Code* or horizontal assembly constructed in accordance with Section 711 of the *International Building Code*, or both. The room shall be a minimum of 96 square feet (9 m²) with a minimum dimension of 8 feet (2438 mm). A layout of the fire command center and all features required by this section to be contained therein shall be submitted for approval prior to installation. The fire command center shall comply with NFPA72 and shall contain the following features:

1. The emergency voice/alarm communication system unit.
2. The fire department communications system.
3. Fire-detection and alarm system annunciator system.
4. Annunciator visually indicating the location of the elevators and whether they are operational.
5. Status indicators and controls for air-handling systems.
6. The fire-fighter's control panel required by Section 909.16 for smoke control systems installed in the building.
7. Controls for unlocking stairway doors simultaneously.
8. Sprinkler valve and water-flow detector display panels.
9. Emergency and standby power status indicators.
10. A telephone for fire department use with controlled access to the public telephone system.
11. Fire pump status indicators.
12. Schematic building plans indicating the typical floor plan and detailing the building core, means of egress, fire protection systems, fire-fighting equipment and fire department access.
13. Work table.
14. Generator supervision devices, manual start and transfer features.
15. Public address system, where specifically required by other sections of this code.
16. Elevator fire recall switch in accordance with ASME A17.1.
17. Elevator emergency or standby power selector switch(es), where emergency or standby power is provided.

Reason: Locate switches vital to needs of the fire department in the fire command center. These switches need to be located within the fire command center as required by ASME A17.1.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: Based on the proponent's reason statement. The proposal will provide additional needed information for fire/emergency scene commanders.

Assembly Action:

None

Final Hearing Results

F43-06/07

AS

Code Change No: F46-06/07

Original Proposal

Section: 603.3.2, Table 2703.1.1(1) [IBC Table [F] 307.1(1)]

Proponent: Lynne M. Kilpatrick, Fire Department, City of Seattle, WA

Revise as follows:

603.3.2 Maximum Inside fuel oil storage. Where connected to a fuel-oil piping system, ~~the maximum amount of fuel-oil storage~~ a combustable liquid storage system having a maximum capacity of 660 gallons (2498 L) is allowed inside any building in a single control area shall be 660 gallons (2498 L). Where the amount of fuel oil stored inside a ~~building single control area~~ exceeds 660 gallons (2498 L), the storage area shall be in compliance with the International Building Code for a Group H-3 Occupancy.

**TABLE 2703.1.1(1) [IBC Table [F]307.1(1)]
MAXIMUM ALLOWABLE QUANTITY PER CONTROL AREA
OF HAZARDOUS MATERIALS POSIG A PHYSICAL HAZARD**

- a. through h. (No change to current text)
- i. Inside any building, the maximum capacity of a combustable liquid storage system that is connected to a fuel-oil piping system shall be and having a maximum capacity of 660 gallons shall be allowed on any floor in a single control area provided such system complies with this code. See Section 603.3.2.

(Portions of table and footnotes not shown do not change)

Reason: This proposal clarifies the intent of Section 603.3.2 which is to allow for a generator tank up to 660 gallons inside a building without requiring the tank system to be located in a Group H Occupancy. If the tank system exceeds 660 gallons then the tank system must be confined to a room or area meeting Group H occupancy requirements. The current code text states that the maximum quantity of fuel-oil storage allowed inside any building cannot exceed 660 gallons.

The change to the table clarifies the intent of the code and allows a single generator fuel tank system up to 660 gallons to be installed anywhere in a building without confining the system to a Group H room or area. It should be noted that the proposed footnote allows the tank system to be installed on any floor of the building and thus the maximum allowable quantity reductions noted in Table 2703.8.3.2 do not apply. As written, the current code text states that the maximum quantity of fuel-oil storage allowed inside any building cannot exceed 660 gallons which is quite unrealistic given the need for fuel for backup generators in virtually every newly constructed building. This code change gives relief to small generator fuel systems which currently are required to be confined to Group H Occupancy rooms or areas if the tank system exceeds 120 gallons in unsprinklered buildings or 240 gallons in sprinklered buildings.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The proposal's reason statement mentions generator tanks but the proposal does not. There needs to be better correlation with Table 2703.1.1(1).

Assembly Action:

None

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Lynne Kilpatrick, Seattle, Washington Fire Department, requests Approval as Modified by this public comment.

Replace proposal with the following modifications to current text:

1. Revise as follows:

603.3.1 Fuel oil storage in outside, aboveground tanks ~~Maximum outside fuel oil storage above ground.~~ Where connected to a fuel-oil piping system, the maximum amount of fuel oil storage allowed outside above ground without additional protection shall be 660 gallons (2498 L). The storage of fuel oil above ground in quantities exceeding 660 gallons (2498 L) shall comply with NFPA 31.

2. Delete and substitute as follows:

~~**603.3.2 Maximum inside fuel oil storage.** Where connected to a fuel-oil piping system, the maximum amount of fuel oil storage allowed inside any building shall be 660 gallons (2498 L). Where the amount of fuel oil stored inside a building exceeds 660 gallons (2498 L), the storage area shall be in compliance with the *International Building Code*.~~

603.3.2 Fuel oil storage inside buildings. Fuel oil storage inside buildings shall comply with Sections 603.3.2.1 through 603.3.2.5 or Chapter 34.

603.3.2.1 Quantity limits. One or more fuel-oil storage tanks containing Class II or Class III combustible liquid shall be permitted in a building. The aggregate capacity of all such tanks shall not exceed 660 gallons (2498 L).

Exception: The aggregate capacity limit shall be permitted to be increased to 3,000 gallons (11,356 L) of Class II or Class III liquid for storage in protected aboveground tanks complying with Section 3404.2.9.6, when all of the following conditions are met:

1. The entire 3,000 gallon (11,356 L) quantity shall be stored in protected aboveground tanks.
2. The 3,000 gallon (11,356 L) capacity shall be permitted to be stored in a single tank or multiple smaller tanks, and
3. The tanks shall be located in a room or rooms protected by an automatic sprinkler system complying with Section 903.3.1.1.

603.3.2.2 Restricted use and connection. Tanks installed in accordance with Section 603.3.2 shall be used only to supply fuel oil to fuel-burning or generator equipment installed in accordance with Section 603.3.2.4. Connections between tanks and equipment supplied by such tanks shall be made using closed-piping systems.

603.3.2.3 Applicability of maximum allowable quantity and control area requirements. The quantity of combustible liquid stored in tanks complying with Section 603.3.2 shall not be counted towards the maximum allowable quantity set forth in Table 2703.1.1 (1), and such tanks shall not be required to be located in a control area.

603.3.2.4 Installation. Tanks and piping systems shall be installed and separated from other uses in accordance with IMC Section 915 and IMC Chapter 13, as applicable.

Exception: Protected aboveground tanks complying with Section 3404.2.9.6 shall not be required to be separated from surrounding areas.

603.3.2.5 Tanks in basements. Tanks in basements shall be located not more than two stories below grade plane.

3. Revise table as follows:

**TABLE 2703.1.1(1) [IBC Table [F]307.1(1)]
MAXIMUM ALLOWABLE QUANTITY PER CONTROL AREA
OF HAZARDOUS MATERIALS POSING A PHYSICAL HAZARD**

a. through h. (No change to current text)

i. ~~The maximum allowable quantity shall not apply to fuel oil storage complying with Section 603.3.2. Inside a building, the maximum capacity of a combustible liquid storage system that is connected to fuel-oil piping system shall be 660 gallons provided such system complies with this code.~~

(Portions of table and footnotes not shown remain unchanged)

Commenter's Reason:

1. Title corrected for editorial correlation with the revised section that follows.
2. This public comment responds to issues raised at the Orlando hearing during testimony on the original proposal as modified by a proposed amendment that was distributed and discussed. The proposed revisions resolve a longstanding problem in the IFC involving the apparent conflict between Table 2703.1.1(1), Footnote "i" and Section 603.3.2. The table implies that fuel oil tanks are subject to the MAQ/control area approach, but Section 603.3.2 instead establishes "per building" quantity limits. This revision clarifies that fuel oil tanks covered by 603.3.2 are not subject to the MAQ/control area regulatory scheme.

The recommended revision also tackles a longstanding problem involving the need for more reasonable size limits for tanks in buildings that serve fuel burning equipment and generators. The intent of this section, through its use of the term "fuel oil," was determined to be related to tanks supplying both fuel oil and generators, and this has been clarified. To address the need for more reasonable quantities, this public comment expands on an idea introduced in the floor modification in Orlando, which recommended increasing permissible quantities when "protected tanks" are used and are located in areas protected by fire sprinklers. Protected tanks represent the highest level of tank construction in widespread use. These tanks have extensive regulations in Chapter 34, and the special UL listing requirements further assure their safety. Included in the special regulations for these tanks are 1) the required ability to survive a 2-hour fire test conducted in accordance with the UL1709 fire exposure protocol, 2) a limitation that all penetrations must be made through the top of the tank (to avoid the risk of a gravity-fed leak that might be associated with a connection below liquid level) and that piping connected to the tank must be provided with anti-siphon controls where needed to prevent a siphon risk, 3) bullet resistance, 4) vehicle impact resistance, and many others. The added safety features more than compensate for the proposed quantity allowance of 3,000 gallons, and by having most of these safety features integral to the tank construction, the level of reliability is very high.

The proposal also correlates the fuel oil equipment requirements in the IFC with applicable requirements in the IMC that are probably often overlooked, and it places a reasonable limit on where tanks can be located in basements.

3. Correlates with Part 2 to clarify that fuel oil tanks installed in accordance with 603.3.2 are not regulated using the MAQ/control area approach.

Final Hearing Results

F46-06/07

AMPC1

Code Change No: F65-06/07

Original Proposal

Sections: 804.3 (IBC [F] 806.6), 802.1 (IBC 802.1)

Proponent: Jesse J. Beitel, Hughes Associates, Inc., representing Armstrong World Industries, Inc.

1. Add new text as follows:

804.3 Interior floor-wall base. Interior floor-wall base that is 6 inches (152 mm) or less in height shall be tested in accordance with NFPA 253 and shall not be less than Class II. Where a Class I floor finish is required, the floor-wall base shall be Class I. The classification referred to herein corresponds to the classifications determined by NFPA 253 as follows: Class I, 0.45 watt/cm² or greater; Class II, 0.22 watts/cm² or greater.

Exception: Interior trim materials that comply with Section 804.1.

802.1 General. The following words and terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

INTERIOR FLOOR-WALL BASE. Interior floor finish trim used to provide a functional and/or decorative border at the intersection of walls and floors.

2. Add new text as follows:

IBC [F] 806.6 Interior floor-wall base. Interior floor-wall base that is 6 inches (152 mm) or less in height shall be tested in accordance with Section 804.2 and shall not be less than Class II. Where a Class I floor finish is required, the floor-wall base shall be Class I.

Exception: Interior trim materials that comply with Section 806.5.

IBC 802.1 General. The following words and terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

[F] INTERIOR FLOOR-WALL BASE. Interior floor finish trim used to provide a functional and/or decorative border at the intersection of walls and floors.

Reason: The purpose of this proposal is to add a new definition and application of a test to clarify requirements of the Code.

This code proposal addresses the issue of testing and regulation of interior floor-wall base trim materials. In many cases, the floor covering material is just seamlessly turned-up or used at the intersection of the floor and the wall and thus it becomes the floor-wall base trim.

Currently, these materials could be considered as interior trim per Sections 804.1 and 806.5 and would be required to be tested per ASTM E 84 even though the floor covering may be required to be tested per NFPA 253. Based on the small amount of material used, it is very difficult to test these materials in a reliable manner, upside down in the ASTM E 84 test method.

Because of their location, at the floor-line, floor-wall base materials are not likely to be involved in a fire until the floor covering is also involved, usually at room flashover. Thus, it is reasonable that floor-wall base materials meet the same criteria as floor coverings. The proposal specifies that floor-wall base materials 6 in. or less in height be tested per NFPA 253 and the proposal provides requirements for this application.

The exception recognizes that some materials used as interior finish trim and that meet the flammability requirements of Section 804.1 can be used in this specific application without the need for additional testing.

The addition of the definition for Floor-Wall Base provides an understanding and clarification of these types of products versus other interior trim materials.

The reference to NFPA 253 is provided and NFPA 253 is currently referenced by the IBC.

A similar proposal was submitted in the 2004/2005 Code Cycle – FS152-04/05. In the Final Action Hearing in Detroit, a public comment was discussed and the membership voted to uphold the public comment and defeat the proposed code change. We have worked with the maker of the public comment and have in this proposal, incorporated changes which address their concerns.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: Based on the proponent's reason statement. The proposal provides reasonable regulation of a commonplace installation practice as well as an appropriate testing standard for materials used in the floor-wall base application.

Assembly Action:

None

Final Hearing Results

F65-06/07

AS

Code Change No: F83-06/07

Original Proposal

Sections: 902.1 (New) [IBC [F] 902.1 (New)]

Proponent: Ed Donoghue, Edward A. Donoghue Associates, Inc., representing National Elevator Industry, Inc.

Add new definition as follows:

902.1 Definitions: The following words and terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

ELEVATOR GROUP. A grouping of elevators in a building located adjacent or directly across from one another that respond to a common hall call button(s).

Reason: Defines "elevator group" for application with Section 907.2.12.2. The term elevator group needs to be defined in order to more clearly designate areas requiring separate paging zones.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: Based on the proponent-s reason statement. The proposal clarifies the code by adding a needed definition from the legacy codes.

Assembly Action:

None

Final Hearing Results

F83-06/07

AS

Code Change No: **F84-06/07**

Original Proposal

Sections: 902.1 (IBC [F] 902.1)

Proponent: John Guhl, Office of the State Fire Marshal, Sacramento, California

1. Revise definitions as follows:

902.1 Definitions. The following words and terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

AVERAGE AMBIENT SOUND LEVEL. The root mean square, A-weighted sound pressure level measured over a 24-hour period, or the time any person is present, whichever time period is less.

DETECTOR, HEAT. A fire detector that senses heat ~~produced by burning substances, either abnormally high temperature or rate- of- rise or both.~~ Heat is the energy produced by combustion that causes substances to rise in temperature.

FIRE ALARM CONTROL UNIT. A system component that receives inputs from automatic and manual fire alarm devices and ~~may be~~ is capable of supplying power to detection devices and transponder(s) or off-premises transmitter(s). The control unit ~~may be~~ is capable of providing a transfer of power to the notification appliances and transfer of condition to relays or devices.

MULTIPLE-STATION SMOKE ALARM. Two or more single-station alarm devices that are capable of inter-connection such that actuation of one causes ~~the appropriate alarm signal to operate in all interconnected alarms. all integral or separate audible alarms to operate.~~

SMOKE ALARM. A single- or multiple-station alarm responsive to smoke, ~~and not connected to a system.~~

2. Add new definition as follows:

ZONE, NOTIFICATION. An area within a building or facility covered by notification appliances which are activated simultaneously.

Reason: The definitions are intended to reflect the language used in the industry. These changes are in keeping with definitions in NFPA 72.

The proposal is an effort made by a group of people from various segments of the industry and code application to improve usability of the code. Before addressing the specific technical issue involved in the proposal, it is worth noting appreciation to the people who helped work on this effort. In alphabetical order:

Bill Aaron (Code Consultants, Inc.),
Diane Arend (Office of the State Fire Marshal; California),
Gene Boecker (Code Consultants, Inc),
Shane Clary (Bay Alarm)
John Guhl (Office of the State Fire Marshal; California),
Tom Hammerberg (Automatic Fire Alarm Association, Inc),
Bill Hopple (SimplexGrinnel),
Dave Lowrey (Fire Rescue; City of Boulder),

Dan Nichols (Building Codes Division; State of New York),
 Jon Nisja (State Fire Marshal Division; Minnesota),
 Brit Rockafellow (Building Project Review, San Diego),
 Jimbo Schiffiliti (Fire Safety Consultants, Inc),
 Dave Stringfield (University of Minnesota)

This is one in a series of code changes. This one incorporates a specific technical issue identified by the group. It is identified here separately in case the composite proposal is deemed too extensive.

AVERAGE AMBIENT SOUND LEVEL: This change is required for correlation with the definition and requirements used in NFPA 72 (2002).

DETECTOR, HEAT: This change is required for correlation with the definition and requirements used in NFPA 72 (2002). This revised definition includes all heat sources, not just limited to burning substances.

FIRE ALARM CONTROL UNIT: This change is required for correlation with the definition used in NFPA 72 (2002). In this case the word "may" is appropriate. The Fire Alarm Control Unit could have the capability to supply power or, alternately, that power could be supplied by an external source. Likewise, if the power supply is external, then the control for it is external as well.

MULTIPLE-STATION SMOKE ALARM: This change is required for correlation with the definition and requirements used in NFPA 72 (2002). This change requires the appropriate alarm signal to operate in all interconnected alarms, and will insure the approved type and synchronization of the notification signals.

SMOKE ALARM: This change is required for correlation with the definition and requirements used in NFPA 72 (2002). This change would allow the connection to a fire alarm system for annunciation if required.

ZONE, NOTIFICATION: This definition is being added to define the term used in the IBC & IFC. This term and definition also correlates with the definition and requirements used in NFPA 72 (2002).

Bibliography:

NFPA 72 – National Fire Alarm Code; 2002 edition.
 NFPA 72 – National Fire Alarm handbook; 2002 edition

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: Based on the proponent-s reason statement. The proposal provides definition revisions to correlate with referenced standard NFPA 72.

Assembly Action:

None

Final Hearing Results

F84-06/07

AS

Code Change No: F85-06/07

Original Proposal

Sections: 903.2.1, 903.2.2 (IBC [F] 903.2.1, [F] 903.2.2)

Proponent: Maureen Traxler, City of Seattle, Washington, Department of Planning & Development

Revise as follows:

903.2.1 Group A. An automatic sprinkler system shall be provided throughout buildings and portions thereof used as Group A occupancies as provided in this section. For Group A-1, A-2, A-3, and A-4 occupancies, the automatic sprinkler system shall be provided throughout the floor area where the Group A-1, A-2, A-3 or A-4 occupancy is located, and in all floors between the Group A occupancy and the highest level of exit discharge. For Group A-5 occupancies, the automatic sprinkler system shall be provided in the spaces indicated in Section 903.2.1.5.

903.2.2 Group E. An automatic sprinkler system shall be provided for Group E occupancies as follows:

1. Throughout all Group E fire areas greater than 20,000 square feet (1858 m²) in area.
2. Throughout every portion of educational buildings below the lowest level of exit discharge.

Exception: An automatic sprinkler system is not required in any fire area or area below the level of exit discharge where every classroom throughout the building has at least one exterior exit door at ground level.

Reason: “Level of exit discharge” is defined as “The horizontal plane located at the point at which an exit terminates and an exit discharge begins.” Buildings on sloping sites often have more than one level of exit discharge. Unless a particular level of exit discharge is specified, these sections are ambiguous. This proposal specifies the highest level of exit discharge in Section 903.2.1, and the lowest level in Section 903.2.2 because those levels provide the occupants the earliest opportunity to leave the building.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The committee agreed that the noted sections are in need of clarification for buildings built on hilly terrain but pointed to the inconsistencies brought out in floor testimony that need to be fixed as the reason for disapproval. In Section 903.2.1, using the term “highest” could be problematic if a Group A occupancy is located below grade in that it could require more sprinklered levels than are actually necessary. The proponent’s intent was to sprinkler levels to the first exit encountered, depending on whether the direction of travel is up or down and the proposal should clearly reflect that intent. It was also suggested that, since the intent is to identify exit discharge levels serving the occupancy, using the word “serving” might be useful. The proponent was encouraged to return with a public comment dealing with those issues.

Assembly Action:

None

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Maureen Traxler, City of Seattle, Washington, Department of Planning and Development requests Approval as Modified by this public comment.

Modify proposal as follows:

903.2.1 Group A. An automatic sprinkler system shall be provided throughout buildings and portions thereof used as Group A occupancies as provided in this section. For Group A-1, A-2, A-3 and A-4 occupancies, the automatic sprinkler system shall be provided throughout the floor area where the Group A-1, A-2, A-3 or A-4 occupancy is located, and in all floors between the Group A occupancy and the ~~highest~~ nearest level of exit discharge serving the Group A occupancy. For Group A-5 occupancies, the automatic sprinkler system shall be provided in the spaces indicated in Section 903.2.1.5.

903.2.2 Group E. An automatic sprinkler system shall be provided for Group E occupancies as follows:

1. Throughout all Group E fire areas greater than 20,000 square feet (1858 m²) in area.
2. Throughout every portion of educational buildings below the lowest level of exit discharge that serves that portion of the building.

Exception: An automatic sprinkler system is not required in any fire area or area below the level of exit discharge where every classroom throughout the building has at least one exterior exit door at ground level.

Commenter-s Reason: Buildings on sloping sites often have more than one level of exit discharge. Unless a particular level of exit discharge is specified, sections 903.2.1 and 903.2.2 are ambiguous. This public comment specifies that sprinklers are required for all floors between Group A occupancies and the level of exit discharge closest to the assembly, that also serves the assembly. This provides protection for occupants of Group A until they reach a floor that provides them access to a public way.

Similarly, section 903.2.2 is modified to provide sprinkler protection for occupants of educational buildings until they reach the nearest level of exit discharge.

Final Hearing Results

F85-06/07

AMPC1

Code Change No: **F89-06/07**

Original Proposal

Sections: 903.2.9 (IBC [F] 903.2.9)

Proponent: Michael E. Dell’Orfano, South Metro Fire Rescue, representing Fire Marshal’s Association of Colorado

Revise as follows:

903.2.9 Group S-2. An automatic sprinkler system shall be provided throughout buildings classified as enclosed parking garages in accordance with Section 406.4 of the *International Building Code* ~~or where located beneath other groups~~ as follows.

1. Where the fire area of the enclosed parking garage exceeds 12,000 square feet (1115 m²); or
2. Where the enclosed parking garage is located beneath other groups.

Exception: Enclosed parking garages located beneath Group R-3 occupancies.

Reason: The purpose of this code change proposal is to address an inconsistency in the IFC with respect to sprinkler thresholds for S-1 and S-2 occupancies. Currently, in IFC Section 903.2.8 there are sprinkler thresholds established for S-1 occupancies; particularly, the fire area needs to reach a certain square footage before sprinklers are required. But, in IFC Section 903.2.9 there is no square footage threshold for S-2 enclosed parking garages; they all need to be sprinklered regardless of square footage. Then, IFC Section 903.2.9.1 brings back in a square footage threshold for commercial parking garages. So currently, the sprinkler requirements for S-2 enclosed parking garages are the most restrictive of the Group S occupancies, yet they are the least hazardous use. It appears then, that a square footage threshold is “missing” in IFC Section 903.2.9. This assumption is supported by the 2003 IFC Commentary which states that it was not the intent for an enclosed parking garage to be more restrictive than a repair garage. Therefore, this code change establishes a sprinkler threshold for S-2 parking garages that is similar to S-1 occupancies.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: Based on the proponent’s reason statement. The proposal adds a needed and reasonable sprinkler threshold that was omitted during drafting of the code to correlate with Group S-1 and other 12,000 square foot thresholds.

Assembly Action:

None

Final Hearing Results

F89-06/07

AS

Code Change No: **F90-06/07**

Original Proposal

Sections: 903.2.10.1 (IBC [F] 903.2.10.1), 2306.6.1.1

Proponent: Gregory G Victor, Fire Department, Glendale, Arizona

Revise as follows:

903.2.10.1 Stories and basements without openings. An automatic sprinkler system shall be installed in every story or basement of all buildings where the floor area exceeds 1,500 square feet (139.4 m²) and where there is not provided at least one of the following types of exterior wall openings:

1. Openings below grade that lead directly to ground level by an exterior stairway complying with Section 1009 or an outside ramp complying with Section 1010. Openings shall be located in each 50 linear feet (15 240 mm), or fraction thereof, of exterior wall in the story on at least one side. The required openings shall be distributed such that the lineal distance between adjacent openings does not exceed 50 feet.
2. Openings entirely above the adjoining ground level totaling at least 20 square feet (1.86 m²) in each 50 linear feet (15 240 mm), or fraction thereof, of exterior wall in the story on at least one side. The required openings shall be distributed such that the lineal distance between adjacent openings does not exceed 50 feet.

2306.6.1.1 Number of doors required. A minimum of one access door shall be provided in each 100 lineal feet (30 480 mm), or fraction thereof, of the exterior walls ~~which~~ that face required fire apparatus access roads. The required access doors shall be distributed such that the lineal distance between adjacent access doors does not exceed 100 feet.

Reason: The purpose of the proposed change is to provide guidance to the reader regarding the separation of the access openings and doors required by the IFC.

This proposal intends to give the reader direction regarding the separation requirements for these doors and openings and to coordinate these two sections with official ICC interpretations on this issue. The current code language does not expressly state what the ICC publishes as the intent of the code. This proposal will correct that by inserting the appropriate language in each section.

The two ICC interpretations on this issue read as follows:

Q: A building is provided with openings in the exterior wall in lieu of the automatic fire suppression system in accordance with Section 903.2.10.1. Is the spacing between the jambs of adjacent openings in the exterior wall permitted to exceed 50 feet?

A: No. Section 903.2.10.1 requires that either exterior stairways, outside ramps or above-ground openings at least 20 square feet in size be located in each 50 lineal feet or fraction thereof of exterior walls. The required openings must be distributed such that the lineal distance between adjacent openings does not exceed 50 feet. The distribution of openings provides fire fighters with ready access to the interior of the building as well as multiple locations to vent smoke from the story in a fire situation.

If the openings in the exterior wall are located without regard to the location of adjacent openings, it is possible that segments of the exterior wall are not provided with the required access to the interior of the building for fire-fighting purposes. Any arrangement of required stairways, ramps or openings that results in a portion of the wall 50 feet or more in length with no openings to the exterior does not meet the intent of the code that access be provided in each 50 lineal feet.

Section 2306.6.1.1 Number of Doors Required

Q: Where fire department access doors are required by Table 2306.2, Section 2306.6.1.1 requires the doors to be provided in each 100 lineal feet of exterior wall, or fraction thereof. Are the access doors required to be located such that the maximum distance between each door does not exceed 100 lineal feet?

A: Yes. The required openings must be distributed such that the lineal distance between adjacent openings does not exceed 100 feet.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: Based on the proponent's reason statement. The proposal provides needed clarification to the code based on published ICC interpretations on these sections.

Assembly Action:**None**

Final Hearing Results

F90-06/07

AS

Code Change No: F96-06/07

Original Proposal

Sections: 903.3.1.2.1 (IBC [F] 903.3.1.2.1)**Proponent:** Kevin Kelly, National Fire Sprinkler Association**Revise as follows:**

903.3.1.2.1 Balconies and decks. Sprinkler protection shall be provided for exterior balconies, decks and ground floor patios of dwelling units where the building is of Type V construction, provided there is a roof or deck above. Sidewall sprinklers that are used to protect such areas shall be permitted to be located such that their deflectors are within 1 inch (25 mm) to 6 inches (152 mm) below the structural members and a maximum distance of 14 inches (356 mm) below the deck of the exterior balconies and decks that are constructed of open wood joist construction.

Reason: This will clarify that these exterior sprinklers are to be installed below a roof or deck above. For the sprinkler to operate correctly they must have a roof to collect the heat and fuse the sprinkler open, otherwise the sprinkler would be of limited value and could potentially decrease the reliability of the interior sprinkler system. This appears to be the intent of this section since it provides sprinkler installation procedures below structural members and decks.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:**Approved as Submitted**

Committee Reason: Based on the proponent-s reason statement. The proposal will clarify the intent of the code on the need for a deck above the sprinkler to facilitate its operation.

Assembly Action:**None**

Final Hearing Results

F96-06/07

AS

Code Change No: **F99-06/07**

Original Proposal

Sections: 903.4, 903.4.1 (IBC [F] 903.4, [F] 903.4.1)

Proponent: Greg Rogers, South Kitsap Fire & Rescue, representing ICC Joint Fire Service Review Committee

Revise as follows:

903.4 Sprinkler system monitoring supervision and alarms. All valves controlling the water supply for automatic sprinkler systems, pumps, tanks, water levels and temperatures, critical air pressures, and water-flow switches on all sprinkler systems shall be electrically supervised by a listed fire alarm control unit.

Exceptions:

1. Automatic sprinkler systems protecting one- and two-family dwellings.
2. Limited area systems serving fewer than 20 sprinklers.
3. Automatic sprinkler systems installed in accordance with NFPA 13R where a common supply main is used to supply both domestic water and the automatic sprinkler system, and a separate shutoff valve for the automatic sprinkler system is not provided.
4. Jockey pump control valves that are sealed or locked in the open position.
5. Control valves to commercial kitchen hoods, paint spray booths or dip tanks that are sealed or locked in the open position.
6. Valves controlling the fuel supply to fire pump engines that are sealed or locked in the open position.
7. Trim valves to pressure switches in dry, preaction and deluge sprinkler systems that are sealed or locked in the open position.

903.4.1 Signals Monitoring. Alarm, supervisory and trouble signals shall be distinctly different and shall be automatically transmitted to an approved central station, remote supervising station or proprietary supervising station as defined in NFPA 72 or, when approved by the fire code official, shall sound an audible signal at a constantly attended location.

Exceptions:

1. Underground key or hub valves in roadway boxes provided by the municipality or public utility are not required to be monitored.
2. Backflow prevention device test valves located in limited area sprinkler system supply piping shall be locked in the open position. In occupancies required to be equipped with a fire alarm system, the backflow preventer valves shall be electrically supervised by a tamper switch installed in accordance with NFPA 72 and separately annunciated.

Reason: Clarifies the equipment requirements for supervision and monitoring of fire sprinkler systems. Reference to NFPA 72 is unnecessary because of the required approval for central, remote or proprietary stations.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: Based on the proponent-s reason statement. The proposal will clarify the intent of the code as to how sprinkler systems are to be supervised.

Assembly Action:

None

Final Hearing Results

F99-06/07

AS

Code Change No: **F104-06/07**

Original Proposal

Sections: 905.3.3 (IBC [F] 905.3.3)

Proponent: Daniel E. Nichols, New York State Department of State

Revise as follows:

905.3.3 Covered mall buildings. A covered mall building shall be equipped throughout with a standpipe system where required by Section 905.3.1. Covered mall buildings not required to be equipped with a standpipe system by Section 905.3.1 shall be equipped with Class I hose connections connected to a the automatic sprinkler system sized to deliver water at 250 gallons per minute (946.4 L/min) at the most hydraulically remote outlet while concurrently supplying the automatic sprinkler system demand. Hose connections shall be provided at each of the following locations:

1. Within the mall at the entrance to each exit passageway or corridor.
2. At each floor-level landing within enclosed stairways opening directly on the mall.
3. At exterior public entrances to the mall.

Reason: The purpose of this code change proposal is to clearly define the 'system' the hose connections need to be connected to as well as a more definitive water supply requirement for covered mall buildings utilizing this section.

The intent of the section is to not require the spacing and additional water flow requirements found in NFPA 14 for a single (or two) story mall. The section permits hose connection valves to be placed on a 'system' but doesn't specifically state 'automatic sprinkler system.' This code change clarifies that the hose connections are required to be connected to the building's required automatic sprinkler system. If this section was ever interpreted to utilize another system, such as the domestic water system, the fire code official may not be able to apply the inspection requirements of NFPA 25 to it since it is not a standpipe nor sprinkler system.

The additional revision to add 'while concurrently supplying the automatic sprinkler system' ensures that the design does not create a condition where firefighting operations diminish the flow to the automatic sprinkler system. Without providing a specific pressure requirement, this proposal also provides the hose connections with a minimum pressure condition.

The State of New York has utilized this covered mall provision since its adoption in 2002. The provision has been working well in New York but the current language is problematic to fire code officials since the intent is to provide hose connections from the sprinkler system piping. These changes will provide a more useful system to firefighters and clear direction for fire code officials doing inspections.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: Based on the proponent's reason statement. The proposal improves correlation with NFPA 14, provides clarification of what type of system the hose connection must be connected to and improves the water supply to supply both hose station and sprinkler demand.

Assembly Action:

None

Final Hearing Results

F104-06/07

AS

Code Change No: F105-06/07

Original Proposal

Sections: 905.6.2 (IBC [F] 905.6.2)

Proponent: Kevin Kelly, National Fire Sprinkler Association

Revise as follows:

905.6.2 Interconnection. In buildings where more than one Class III standpipe is provided, the standpipes shall be interconnected ~~at the bottom~~ in accordance with NFPA 14.

Reason: NFPA 14 requires standpipes to be interconnected close to the water source. This may not necessarily be at the bottom. For example the water source could be at the ground floor or at the top if the water supply is a water tank on the roof. This proposed language will also coordinate with Section 905.4.2.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: Based on the proponent-s reason statement. The proposal will provide correlation with the referenced standard, NFPA 14, and provides flexibility regarding the location of standpipe riser interconnection.

Assembly Action:

None

Final Hearing Results

F105-06/07

AS

Code Change No: F118-06/07

Original Proposal

Sections: 907.10.1 (IBC [F] 907.9.1)

Proponent: Dave Frable, U.S. General Services Administration

Revise as follows:

907.10.1 Visible alarms. Visible alarm notification appliances shall be provided in accordance with Sections 907.10.1.1 through 907.10.1.4.

Exceptions:

1. Visible alarm notification appliances are not required in alterations, except where an existing fire alarm system is upgraded or replaced, or a new fire alarm system is installed.
2. Visible alarm notification appliances shall not be required in exits as defined in Section 1002.1.
3. Visible alarm notification appliances shall not be required in elevator cars.

Reason: It has come to our attention that several jurisdictions across the country have been requiring visible alarm notification appliances to be installed in elevator cars since there is no exception in the IFC or the NFPA 72, *National Fire Alarm Code* for not installing this type of notification appliance in elevator cars. This code proposal will eliminate any confusion regarding the need to install visible notification appliances in elevator cars. The rationale for not installing visible notification appliances in elevator cars is the same as for exit enclosures; high light intensity from these notification appliances may cause confusion and disorientation. Last but not least, the NFPA 72 Technical Committee on Protected Premise Fire Alarm Systems is also trying to eliminate any confusion with regard to where visible notification appliances are required to be installed in buildings and has also proposed to add new text in the next edition of NFPA 72 that would state "visible signals shall not be required in elevator cars".

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: Based on the proponent's reason statement. The proposal will provide clarification regarding where visible alarm notification appliances are not required and will also provide better correlation with NFPA 72.

Assembly Action:

None

Final Hearing Results

F118-06/07

AS

Code Change No: F120-06/07

Original Proposal

Sections: 907.12 (IBC [F] 907.11); IMC 606.4.1

Proponent: Gregory G. Victor, Fire Department, Glendale, AZ, representing himself

THIS PROPOSAL IS ON THE AGENDA OF THE IFC AND THE IMC CODE DEVELOPMENT COMMITTEES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IFC

Revise as follows:

907.12 Duct smoke detectors. Duct smoke detectors shall be connected to the building's fire alarm control panel when a fire alarm system is ~~provided~~ required by section 907.2. Activation of a duct smoke detector shall initiate a visible and audible supervisory signal at a constantly attended location. Duct smoke detectors shall not be used as a substitute for required open area detection.

Exceptions:

1. The supervisory signal at a constantly attended location is not required where duct smoke detectors activate the building's alarm notification appliances.
2. In occupancies not required to be equipped with a fire alarm system, actuation of a smoke detector shall activate a visible and an audible signal in an approved location. Smoke detector trouble conditions shall activate a visible or audible signal in an approved location and shall be identified as air duct detector trouble.

PART II – IMC

Revise as follows:

606.4.1 Supervision. The duct smoke detectors shall be connected to a fire alarm system when a fire alarm system is required by Section 907.2 of the *International Fire Code*. The actuation of a duct smoke detector shall activate a visible and audible supervisory signal at a constantly attended location.

Exceptions:

1. The supervisory signal at a constantly attended location is not required where the duct smoke detector activates the building’s alarm-indicating appliances.
2. In occupancies not required to be equipped with a fire alarm system, actuation of a smoke detector shall activate a visible and an audible signal in an approved location. Duct smoke detector trouble conditions shall activate a visible or audible signal in an approved location and shall be identified as air duct detector trouble.

Reason: To coordinate IFC Section 907.12 with IFC Section 907.11 and IMC Section 606.4.1.

Section 907.11 reads:

“ **907.11 Fire safety functions.** Automatic fire detectors utilized for the purpose of performing fire safety functions shall be connected to the building’s fire alarm control panel **where a fire alarm system is required by Section 907.2 (emphasis added)**. Detectors shall, upon actuation, perform the intended function and activate the alarm notification appliances or activate a visible and audible supervisory signal at a constantly attended location. In buildings not required to be equipped with a fire alarm system, the automatic fire detector shall be powered by normal electrical service and, upon actuation, perform the intended function. The detectors shall be located in accordance with NFPA 72.”

Section 907.11 makes it clear that it is the intent of the IFC that fire safety functions shall be connected to a fire alarm system only when Section 907.2 requires a system. The function of the duct smoke detector is to shut down the air handler and send a “hey Joe” supervisory signal so that someone knows something is up. The current language in the 907.12 and IMC 606.4.1 is confusing by simply calling out a fire alarm system, even though exception 2 hints at the fire alarm requirement when it reads in part “In occupancies not required to be equipped with a fire alarm system...” We have received numerous questions regarding when this connection must be made and what constitutes a fire alarm system.

This proposal clarifies the intent of the code and clarifies the requirement for the user by duplicating the appropriate portion of the language found in 907.11 in these two sections.

Cost Impact: The code change proposal may slightly increase the cost of construction where no fire alarm is required.

Public Hearing Results

PART I C IFC

Committee Action:

Approved as Submitted

Committee Reason: Based on the proponent-s reason statement. The proposal clarifies the intent of the code and correlates IFC Sections 907.12 and 907.11.

Assembly Action:

None

PART II C IMC

Committee Action:

Approved as Submitted

Committee Reason: The proposed change provides a reference to the appropriate section of the *International Fire Code* for guidance on when a fire alarm is required.

Assembly Action:

None

Final Hearing Results

F120-06/07, Part I	AS
F120-06/07, Part II	AS

Code Change No: F122-06/07

Original Proposal

Sections: 907 (IBC [F] 907)

Proponent: Gene Boecker, Code Consultants, Inc.

THIS PROPOSAL IS ON THE AGENDA OF THE IFC AND THE IBC FIRE SAFETY CODE DEVELOPMENT COMMITTEES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IFC

Revise and reorganize section as follows:

SECTION 907 FIRE ALARM AND DETECTION SYSTEMS

907.1 General. This section covers the application, installation, performance and maintenance of fire alarm systems and their components in new and existing buildings and structures. The requirements of Section 907.2 are applicable to new buildings and structures. The requirements of Section 907.3 are applicable to existing buildings and structures as follows:

1. The requirements of Section 907.2 are applicable to new buildings and structures.
2. The requirements of Section 907.3 are applicable to existing buildings and structures.

907.1.1 ~~Construction documents~~ Shop drawings. ~~Construction documents~~ Shop drawings for fire alarm systems shall be submitted for review and approval prior to system installation. ~~Construction documents~~ shop drawings shall include, but not be limited to, all of the following:

1. A floor plan which indicates the use of all rooms.
2. Locations of alarm-initiating and notification appliances.
3. ~~Alarm control and trouble signaling equipment.~~ Location of fire alarm control unit, transponders, and notification power supplies.
4. ~~Annunciation.~~ Annunciators.
5. Power connection.
6. Battery calculations.
7. Conductor type and sizes.
8. Voltage drop calculations.
9. ~~Manufacturers,~~ data sheets indicating model numbers and listing information for equipment, devices and materials.
10. Details of ceiling height and construction.
11. The interface of fire safety control functions.
12. Classification of the supervising station.

907.1.2 Equipment. Systems and their components shall be listed and approved for the purpose for which they are installed.

907.2 Where required—new buildings and structures. An approved manual, automatic or manual and automatic fire alarm system installed in accordance with the provisions of this code and NFPA 72 shall be provided in new buildings and structures in accordance with Sections 907.2.1 through ~~907.2.23~~ 907.2.21 and provide occupant notification in accordance with Section ~~907.40~~ 907.6, unless other requirements are provided by another section of this code. ~~Where automatic sprinkler protection installed in accordance with Section 903.3.1.1 or 903.3.1.2 is provided and connected to the building fire alarm system, automatic heat detection required by this section shall not be required.~~

~~The automatic fire detectors shall be smoke detectors. Where ambient conditions prohibit installation of automatic smoke detection, other automatic fire detection shall be allowed. A minimum of one manual fire alarm box shall be provided in an approved location to initiate a fire alarm signal for fire alarm systems employing automatic fire detectors or waterflow detection devices. Where other sections of this code allow elimination of fire alarm boxes due to sprinklers, a single fire alarm box shall be installed.~~

Exception: The manual fire alarm box is not required for fire alarm systems dedicated to elevator recall control and supervisory service.

907.2.1 Group A. A manual fire alarm system that activates the occupant notification system in accordance with Section 907.6 shall be installed in Group A occupancies having an occupant load of 300 or more. Portions of Group E occupancies occupied for assembly purposes shall be provided with a fire alarm system as required for the Group E occupancy.

Exception: Manual fire alarm boxes are not required where the building is equipped throughout with an automatic sprinkler system and the ~~alarm~~ occupant notification appliances will activate throughout the notification zones upon sprinkler water flow.

907.2.1.1 System initiation in Group A occupancies with an occupant load of 1,000 or more. Activation of the fire alarm in Group A occupancies with an occupant load of 1,000 or more shall initiate a signal using an emergency voice/alarm communications system in accordance with ~~NFPA 72~~ Section 907.6.2.2.

Exception: Where approved, the prerecorded announcement is allowed to be manually deactivated for a period of time, not to exceed 3 minutes, for the sole purpose of allowing a live voice announcement from an approved, constantly attended location.

~~9097.2.1.2 Emergency power.~~ (Relocated to Section 907.6.2.2.3)

907.2.2 Group B. A manual fire alarm system that activates the occupant notification system in accordance with Section 907.6 shall be installed in Group B occupancies where one of the following conditions exists:

1. The combined Group B occupant load of all floors is ~~having an occupant load of~~ 500 or more, persons or
2. The Group B occupant load is more than 100 persons above or below the lowest level of exit discharge.

Exception: Manual fire alarm boxes are not required where the building is equipped throughout with an automatic sprinkler system and the ~~alarm~~ occupant notification appliances will activate throughout the notification zones upon sprinkler water flow.

907.2.3 Group E. A manual fire alarm system that activates the occupant notification system in accordance with Section 907.6 shall be installed in Group E occupancies. When automatic sprinkler systems or smoke detectors are installed, such systems or detectors shall be connected to the building fire alarm system.

Exceptions:

1. A manual fire alarm system is not required in Group E occupancies with an occupant load of less than 50.
2. Manual fire alarm boxes are not required in Group E occupancies where all of the following apply:
 - 2.1. Interior corridors are protected by smoke detectors ~~with alarm verification~~.
 - 2.2. Auditoriums, cafeterias, gymnasiums and ~~the like~~ similar areas are protected by heat detectors or other approved detection devices.
 - 2.3. Shops and laboratories involving dusts or vapors are protected by heat detectors or other approved detection devices.
 - ~~2.4. Off-premises monitoring is provided.~~
 - ~~2.5.~~ 2.4. The capability to activate the evacuation signal from a central point is provided.
 - ~~2.6.~~ 2.5. In buildings where normally occupied spaces are provided with a two-way communication system between such spaces and a constantly attended receiving station from where a general evacuation alarm can be sounded, except in locations specifically designated by the fire code official.
3. Manual fire alarm boxes shall not be required in Group E occupancies where the building is equipped throughout with an approved automatic sprinkler system, the notification appliances will activate on sprinkler water flow and manual activation is provided from a normally occupied location.

907.2.4 Group F. A manual fire alarm system that activates the occupant notification system in accordance with Section 907.6 shall be installed in Group F occupancies where both of the following conditions exist:

1. The Group F occupancy is ~~that are~~ two or more stories in height; and
2. The Group F occupancy has ~~have an~~ a combined occupant load of 500 or more above or below the lowest level of exit discharge.

Exception: Manual fire alarm boxes are not required where the building is equipped throughout with an automatic sprinkler system and the ~~alarm occupant~~ notification appliances will activate throughout the notification zones upon sprinkler water flow.

907.2.5 Group H. A manual fire alarm system shall be installed in Group H-5 occupancies and in occupancies used for the manufacture of organic coatings. An automatic smoke detection system shall be installed for highly toxic gases, organic peroxides and oxidizers in accordance with Chapters 37, 39 and 40, respectively.

907.2.6 Group I. A manual fire alarm system shall be installed in Group I occupancies. An ~~electrically supervised,~~ automatic smoke detection system shall be provided in accordance with Sections 907.2.6.1 and 907.2.6.2.

Exception: Manual fire alarm boxes in resident or patient sleeping areas of Group I-1 and I-2 occupancies shall not be required at exits if located at all nurses' control stations or other constantly attended staff locations, provided such stations are visible and continuously accessible and that travel distances required in Section ~~907.4.4~~ 907.5.2 are not exceeded.

907.2.6.1 Group I-1. ~~Corridors,~~ An automatic smoke detection system shall be installed in corridors, waiting areas open to corridors and habitable spaces other than sleeping units and kitchens, and waiting areas that are open to corridors shall be equipped with an automatic smoke detection system. The system shall be activated in accordance with Section 907.6.

Exceptions:

1. Smoke detection in habitable spaces is not required where the facility is equipped throughout with an automatic sprinkler system.
2. Smoke detection is not required for exterior balconies.

907.2.6.1.1 Smoke alarms. Single- and multiple-station smoke alarms shall be installed in accordance with Section 907.2.10.

907.2.6.2 Group I-2. An automatic smoke detection system shall be installed in corridors in nursing homes (both intermediate care and skilled nursing facilities), detoxification facilities and spaces permitted to be open to the corridors by Section 407.2 of the *International Building Code* shall be equipped with an automatic fire detection system. The system shall be activated in accordance with Section 907.6. Hospitals shall be equipped with smoke detection as required in Section 407.2 of the *International Building Code*.

Exceptions:

1. Corridor smoke detection is not required in smoke compartments that contain patient sleeping units where patient sleeping units are provided with smoke detectors that comply with UL 268. Such detectors shall provide a visual display on the corridor side of each patient sleeping unit and shall provide an audible and visual alarm at the nursing station attending each unit.
2. Corridor smoke detection is not required in smoke compartments that contain patient sleeping units where patient sleeping unit doors are equipped with automatic door-closing devices with integral smoke detectors on the unit sides installed in accordance with their listing, provided that the integral detectors perform the required alerting function.

907.2.6.3 Group I-3 occupancies. Group I-3 occupancies shall be equipped with a manual and automatic fire alarm system installed for alerting staff.

907.2.6.3.1 System initiation. Actuation of an automatic fire-extinguishing system, a manual fire alarm box or a fire detector shall initiate an approved fire alarm signal which automatically notifies staff. ~~Presignal systems shall not be used.~~

907.2.6.3.2 Manual fire alarm boxes. Manual fire alarm boxes are not required to be located in accordance with Section ~~907.4~~ 907.5.2 where the fire alarm boxes are provided at staff-attended locations having direct supervision over areas where manual fire alarm boxes have been omitted.

Manual fire alarm boxes are allowed to be locked in areas occupied by detainees, provided that staff members are present within the subject area and have keys readily available to operate the manual fire alarm boxes.

907.2.6.3.3 Smoke detectors. An ~~approved~~ automatic smoke detection system shall be installed throughout resident housing areas, including sleeping units and contiguous day rooms, group activity spaces and other common spaces normally accessible to residents.

Exceptions:

1. Other approved smoke-detection arrangements providing equivalent protection, including, but not limited to, placing detectors in exhaust ducts from cells or behind protective guards listed for the purpose, are allowed when necessary to prevent damage or tampering.
2. Sleeping units in Use Conditions 2 and 3.
3. Smoke detectors are not required in sleeping units with four or fewer occupants in smoke compartments that are equipped throughout with an ~~approved~~ automatic sprinkler system.

907.2.7 Group M. A manual fire alarm system that activates the occupant notification system in accordance with Section 907.6 shall be installed in Group M occupancies where one of the following conditions exists:

1. The combined Group M occupant load of all floors is ~~having an occupant load of~~ 500 or more persons, or
2. The Group M occupant load is more than 100 persons above or below the lowest level of exit discharge. ~~The initiation of a signal from a manual fire alarm box shall initiate alarm notification appliances as required by Section 907.10.~~

Exceptions:

1. A manual fire alarm system is required in covered mall buildings complying with Section 402 of the *International Building Code*.
2. Manual fire alarm boxes are not required where the building is equipped throughout with an automatic sprinkler system and the ~~alarm~~ occupant notification appliances will automatically activate throughout the notification zones upon sprinkler water flow.

907.2.7.1 Occupant notification. During times that the building is occupied, the initiation of a signal from a manual fire alarm box or from a water flow switch shall not be required to activate the alarm notification appliances when an alarm signal is activated at a constantly attended location from which evacuation instructions shall be initiated over an emergency voice/alarm communication system installed in accordance with Section ~~907.2.12.2~~ 907.6.2.2.

The emergency voice/alarm communication system shall be allowed to be used for other announcements, provided the manual fire alarm use takes precedence over any other use.

907.2.8 Group R-1. Fire alarm systems and smoke alarms shall be installed in Group R-1 occupancies as required in Sections 907.2.8.1 through 907.2.8.3.

907.2.8.1 Manual fire alarm system. A manual fire alarm system that activates the occupant notification system in accordance with Section 907.6 shall be installed in Group R-1 occupancies.

Exceptions:

1. A manual fire alarm system is not required in buildings not more than two stories in height where all individual dwelling units or sleeping units and contiguous attic and crawl spaces to those units are separated from each other and public or common areas by at least 1-hour fire partitions and each individual dwelling unit or sleeping unit has an exit directly to a public way, exit court or yard.
2. Manual fire alarm boxes are not required throughout the building when the following conditions are met:
 - 2.1. The building is equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2.
 - 2.2. The notification appliances will activate upon sprinkler water flow; and
 - 2.3. At least one manual fire alarm box is installed at an approved location.

907.2.8.2 Automatic fire alarm system. An automatic fire alarm system that activates the occupant notification system in accordance with Section 907.6 shall be installed throughout all interior corridors serving dwelling units or sleeping units.

Exception: An automatic fire detection system is not required in buildings that do not have interior corridors serving dwelling units or sleeping units and where each dwelling unit or sleeping unit has a means of egress door opening directly to an exit or to an exterior exit access that leads directly to an exit.

907.2.8.3 Smoke alarms. ~~Single- and multiple-station smoke alarms shall be installed as required by in accordance with Section 907.2.10. In buildings that are not equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2, the smoke alarms in sleeping units shall be connected to an emergency electrical system and shall be annunciated by sleeping unit at a constantly attended location from which the fire alarm system is capable of being manually activated.~~

907.2.9 Group R-2. Fire alarm systems and smoke alarms shall be installed in Group R-2 occupancies as required in Section 907.2.9.1 and 907.9.2.

907.2.9.1 Manual fire alarm system. A manual fire alarm system that activates the occupant notification system in accordance with Section 907.6 shall be installed in Group R-2 occupancies where:

1. Any dwelling unit or sleeping unit is located three or more stories above the lowest level of exit discharge;
2. Any dwelling unit or sleeping unit is located more than one story below the highest level of exit discharge of exits serving the dwelling unit or sleeping unit; or
3. The building contains more than 16 dwelling units or sleeping units.

Exceptions:

- ~~1. A fire alarm system is not required in buildings not more than two stories in height where all dwelling units or sleeping units and contiguous attic and crawl spaces are separated from each other and public or common areas by at least 1-hour fire partitions and each dwelling unit or sleeping unit has an exit directly to a public way, exit court or yard.~~
2. 1. Manual fire alarm boxes are not required where the building is equipped throughout with an automatic sprinkler system and the building when the following conditions are met:
 - ~~2.1. The building is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2; and~~
 - ~~2.2. The occupant notification appliances will automatically activate throughout the notification zones upon a sprinkler water flow.~~
- ~~3. 2. A manual fire alarm system is not required in buildings not more than two stories in height that do not have interior corridors serving dwelling units and are protected by an approved automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2, provided that dwelling units either have a means of egress door opening directly to an exterior exit access that leads directly to the exits or are served by open-ended corridors designed in accordance with Section 1023.6, Exception 4.~~

907.2.9.2 Smoke alarms. Single- and multiple-station smoke alarms shall be installed in accordance with Section 907.2.10.

907.2.10 Single- and multiple-station smoke alarms. Listed single- and multiple-station smoke alarms complying with UL 217 shall be installed in accordance with the provisions of this code Sections 907.1.10.1 through 907.2.10.4 and the household fire warning equipment provisions of NFPA 72.

907.2.10.1 Where required. ~~Single- or multiple-station smoke alarms shall be installed in the locations described in Sections 907.2.10.1.1 through 907.2.10.1.3.~~

907.2.10.1.1 907.2.10.1 Group R-1. Single- or multiple-station smoke alarms shall be installed in all of the following locations in Group R-1:

1. In sleeping areas.
2. In every room in the path of the means of egress from the sleeping area to the door leading from the dwelling unit or sleeping unit.
3. In each story within the dwelling unit or sleeping unit, including basements. For dwelling units or sleeping units with split levels and without an intervening door between the adjacent levels, a smoke alarm installed on the upper level shall suffice for the adjacent lower level provided that the lower level is less than one full story below the upper level.

907.2.10.1.2 907.2.10.2 Groups R-2, R-3, R-4 and I-1. Single or multiple-station smoke alarms shall be installed and maintained in Groups R-2, R-3, R-4 and I-1 regardless of occupant load at all of the following locations:

1. On the ceiling or wall outside of each separate sleeping area in the immediate vicinity of bedrooms.
2. In each room used for sleeping purposes.

Exception: Single- or multiple-station smoke alarms in Group I-1 shall not be required where smoke detectors are provided in the sleeping rooms as part of an automatic smoke detection system.

3. In each story within a dwelling unit, including basements but not including crawl spaces and uninhabitable attics. In dwellings or dwelling units with split levels and without an intervening door between the adjacent levels, a smoke alarm installed on the upper level shall suffice for the adjacent lower level provided that the lower level is less than one full story below the upper level.

~~907.2.10.1.3 Group I-1. Single or multiple station smoke alarms shall be installed and maintained in sleeping areas in Group I-1 occupancies.~~

~~Exception: Single or multiple station smoke alarms shall not be required where the building is equipped throughout with an automatic fire detection system in accordance with Section 907.2.6.~~

907.2.10.3 Interconnection. Where more than one smoke alarm is required to be installed within an individual dwelling unit or sleeping unit in Groups R-1, R-2, R-3 or R-4, ~~or within an individual sleeping unit in Group R-1,~~ the smoke alarms shall be interconnected in such a manner that the activation of one alarm will activate all of the alarms in the individual unit. The alarm shall be clearly audible in all bedrooms over background noise levels with all intervening doors closed.

~~907.2.10.4 Acceptance testing.~~ (Relocated to Section 907.8.1)

~~907.2.10.2~~ **907.2.10.4 Power source.** In new construction, required smoke alarms shall receive their primary power from the building wiring where such wiring is served from a commercial source and shall be equipped with a battery backup. Smoke alarms with integral strobes that are not equipped with battery back-up shall be connected to an emergency electrical system. Smoke alarms shall emit a signal when the batteries are low. Wiring shall be permanent and without a disconnecting switch other than as required for overcurrent protection.

~~Exception: Smoke alarms are not required to be equipped with battery backup in Group R-4 where they are connected to an emergency electrical system.~~

907.2.11 Special amusement buildings. An approved automatic smoke detection system shall be provided in special amusement buildings in accordance with this section.

Exception: In areas where ambient conditions will cause a smoke detection system to alarm, an approved alternative type of automatic fire detector shall be installed.

907.2.11.1 Alarm. Activation of any single smoke detector, the automatic sprinkler system or any other automatic fire detection device shall immediately sound an alarm at the building at a constantly attended location from which emergency action can be initiated, including the capability of manual initiation of requirements in Section 907.2.11.2.

907.2.11.2 System response. The activation of two or more smoke detectors, a single smoke detector with alarm verification, the automatic sprinkler system or other approved fire detection device shall automatically:

1. Cause illumination of the means of egress with light of not less than 1 foot-candle (11 lux) at the walking surface level;
2. Stop any conflicting or confusing sounds and visual distractions; ~~and~~
3. Activate an approved directional exit marking that will become apparent in an emergency; ~~and~~
4. ~~Such system response shall also include activation of~~ Activate a prerecorded message, clearly audible throughout the special amusement building, instructing patrons to proceed to the nearest exit. Alarm signals used in conjunction with the prerecorded message shall produce a sound which is distinctive from other sounds used during normal operation.

~~The wiring to the auxiliary devices and equipment used to accomplish the above fire safety functions shall be monitored for integrity in accordance with NFPA 72.~~

907.2.11.3 Emergency voice/alarm communication system. An emergency voice/alarm communication system, which is also allowed to serve as a public address system, shall be installed in accordance with ~~NFPA 72~~ Section 907.6.2.2 and be audible throughout the entire special amusement building.

907.2.12 High-rise buildings. Buildings with a floor used for human occupancy located more than 75 feet (22 860 mm) above the lowest level of fire department vehicle access shall be provided with an automatic fire alarm system and an emergency voice/alarm communication system in accordance with Section ~~907.2.12.2~~ 907.6.2.2.

Exceptions:

1. Airport traffic control towers in accordance with Section 907.2.22 and Section 412 of the *International Building Code*.

2. Open parking garages in accordance with Section 406.3 of the *International Building Code*.
3. Buildings with an occupancy in Group A-5 in accordance with Section 303.1 of the *International Building Code*.
4. Low-hazard special occupancies in accordance with Section 503.1.1 of the *International Building Code*.
5. Buildings with an occupancy in Group H-1, H-2 or H-3 in accordance with Section 415 of the *International Building Code*.
6. In Group I-1 and I-2 occupancies, the alarm shall sound at a constantly attended location and general occupant notification shall be broadcast by the paging system.

907.2.12.1 Automatic fire detection. Smoke detectors shall be provided in accordance with this section. Smoke detectors shall be connected to an automatic fire alarm system. The activation of any detector required by this section shall operate the emergency voice/alarm communication system. Smoke detectors shall be located as follows:

1. In each mechanical equipment, electrical, transformer, telephone equipment or similar room which is not provided with sprinkler protection, elevator machine rooms, and in elevator lobbies.
2. In the main return air and exhaust air plenum of each air-conditioning system having a capacity greater than 2,000 cubic feet per minute (cfm) (0.94 m³/s). Such detectors shall be located in a serviceable area downstream of the last duct inlet.
3. At each connection to a vertical duct or riser serving two or more stories from a return air duct or plenum of an air-conditioning system. In Group R-1 and R-2 occupancies, a ~~listed~~ smoke detector is allowed to be used in each return-air riser carrying not more than 5,000 cfm (2.4m³/s) and serving not more than 10 air-inlet openings.

~~907.2.12.2 Emergency voice/alarm communication system.~~ (Relocated to Section 907.6.2.2)

~~907.2.12.2.1 Manual override.~~ (Relocated to Section 907.6.2.2.1)

~~907.2.12.2.2 Live voice messages.~~ (Relocated to Section 907.6.2.2.2)

~~907.2.12.2.3 Standard.~~ (Relocated to Section 907.6.2.2)

907.2.12.3 907.2.12.2 Fire department communication system. An approved two-way, fire department communication system designed and installed in accordance with NFPA 72 shall be provided for fire department use. It shall operate between a fire command center complying with Section 509 and elevators, elevator lobbies, emergency and standby power rooms, fire pump rooms, areas of refuge and inside enclosed exit stairways. The fire department communication device shall be provided at each floor level within the enclosed exit stairway.

Exception: Fire department radio systems where approved by the fire department.

907.2.13 Atriums connecting more than two stories. A fire alarm system shall be installed in occupancies with an atrium that connects more than two stories. The system shall be activated in accordance with Section ~~907.7~~ 907.6. Such occupancies in Group A, E or M shall be provided with an emergency voice/alarm communication system complying with the requirements of Section ~~907.2.12.2~~ 907.6.2.2.

907.2.14 High-piled combustible storage areas. An automatic fire detection system shall be installed throughout high-piled combustible storage areas where required by Section 2306.5.

~~907.2.15 Delay egress locks.~~ (Relocated to Section 907.4.2)

~~907.2.16~~ **907.2.15 Aerosol storage uses.** Aerosol storage rooms and general-purpose warehouses containing aerosols shall be provided with an approved manual fire alarm system where required by this code.

~~907.2.17~~ **907.2.16 Lumber, wood structural panel and veneer mills.** Lumber, wood structural panel and veneer mills shall be provided with a manual fire alarm system.

~~907.2.18~~ **907.2.17 Underground buildings with smoke exhaust control systems.** Where a smoke exhaust control system is installed in an underground building in accordance with the *International Building Code*, automatic fire detectors shall be provided in accordance with this section.

~~907.2.18.1~~ **907.2.17.1 Smoke detectors.** A minimum of one smoke detector listed for the intended purpose shall be installed in the following areas:

1. Mechanical equipment, electrical, transformer, telephone equipment, elevator machine or similar rooms.
2. Elevator lobbies.
3. The main return and exhaust air plenum of each air-conditioning system serving more than one story and located in a serviceable area downstream of the last duct inlet.
4. Each connection to a vertical duct or riser serving two or more floors from return air ducts or plenums of heating, ventilating and air-conditioning systems, except that in Group R occupancies, a listed smoke detector is allowed to be used in each return-air riser carrying not more than 5,000 cfm (2.4 m³/s) and serving not more than 10 air inlet openings.

907.2.18.2 907.2.17.2 Alarm required. Activation of the smoke ~~exhaust~~ control system shall activate an audible alarm at a constantly attended location.

907.2.19 907.2.17.3 Deep underground buildings. Where the lowest level of a structure is more than 60 feet (18 288 mm) below the lowest level of exit discharge, the structure shall be equipped throughout with a manual fire alarm system, including an emergency voice/alarm communication system installed in accordance with Section 907.2.12.2 907.6.2.2.

907.2.19.4 907.2.17.3.1 Public address system. Where a fire alarm system is not required by Section 907.2, a public address system shall be provided which shall be capable of transmitting voice communications to the highest level of exit discharge serving the underground portions of the structure and all levels below.

907.2.20 907.2.18 Covered mall buildings. Covered mall buildings exceeding 50,000 square feet (4645 m²) in total floor area shall be provided with an emergency voice/alarm communication system. An emergency voice/alarm communication system serving a mall, required or otherwise, shall be accessible to the fire department. The system shall be provided in accordance with Section ~~907.2.12.2~~ 907.6.2.2.

907.2.24 907.2.19 Residential aircraft hangars. A minimum of one ~~listed~~ single-station smoke alarm shall be installed within a residential aircraft hangar as defined in the *International Building Code* and shall be interconnected into the residential smoke alarm or other sounding device to provide an alarm which will be audible in all sleeping areas of the dwelling.

907.2.22 907.2.20 Airport traffic control towers. An automatic fire detection system that activates the occupant notification system in accordance with Section 907.6 shall be provided in airport traffic control towers in all occupiable spaces.

907.2.23 907.2.21 Battery rooms. An ~~approved~~ automatic smoke detection system shall be installed in areas containing stationary storage battery systems ~~having with~~ a liquid capacity of more than 50 gallons (189 L). The detection system shall activate a local alarm signal at a constantly attended location or shall be supervised by an approved central, proprietary, or remote station service ~~or a local alarm which will sound an audible signal at a constantly attended location~~.

907.3 Where required—retroactive in existing buildings and structures. An approved manual, automatic or manual and automatic fire alarm system shall be installed in existing buildings and structures in accordance with Sections 907.3.1 through 907.3.1.8 and provide occupant notification in accordance with Section 907.6 unless other requirements are provided by other sections of this code. ~~Where automatic sprinkler protection is provided in accordance with Section 903.3.1.1 or 903.3.1.2 and connected to the building fire alarm system, automatic heat detection required by this section shall not be required.~~

~~An approved automatic fire detection system shall be installed in accordance with the provisions of this code and NFPA 72. Devices, combinations of devices, appliances and equipment shall be approved. The automatic fire detectors shall be smoke detectors, except an approved alternative type of detector shall be installed in spaces such as boiler rooms where, during normal operation, products of combustion are present in sufficient quantity to actuate a smoke detector.~~

907.3.1 Occupancy requirements. A fire alarm system shall be installed in accordance with Sections 907.3.1.1 through 907.3.1.8.

Exception: Occupancies with an existing, previously approved fire alarm system.

907.3.1.1 907.3.1 Group E. A fire alarm system shall be installed in existing Group E occupancies in accordance with Section 907.2.3.

Exceptions:

1. A manual fire alarm system is not required in a building with a maximum area of 1,000 square feet (93 m²) that contains a single classroom and is located no closer than 50 feet (15 240 mm) from another building.
2. A manual fire alarm system is not required in Group E with an occupant load less than 50.

907.3.2 Group I. A fire alarm system shall be installed in existing Group I occupancies in accordance with Sections 907.3.2.1 through 907.3.2.3.

Exception: Manual fire alarm boxes in resident or patient sleeping areas of Group I-1 and I-2 occupancies shall not be required at exits if located at all nurses' control stations or other constantly attended staff locations, provided such stations are visible and continuously accessible and that travel distances required in Section 907.5.2 are not exceeded.

907.3.1.2 907.3.2.1 Group I-1. An automatic or manual fire alarm system shall be installed in existing Group I-1 residential care/assisted living facilities in accordance with Section 907.2.6.1.

Exception: Where each sleeping room has a means of egress door opening directly to an exterior egress balcony that leads directly to the exits in accordance with Section 1014.5, and the building is not more than three stories in height.

907.3.1.3 907.3.2.2 Group I-2. An automatic or manual fire alarm system shall be installed in existing Group I-2 occupancies in accordance with Section 907.2.6.2.

907.3.1.4 907.3.2.3 Group I-3. An automatic or manual fire alarm system shall be installed in existing Group I-3 occupancies in accordance with Section 907.2.6.3.

907.3.3 Group R. A fire alarm system and smoke alarms shall be installed in existing Group R occupancies in accordance with Sections 907.3.3.1 through 907.3.3.4.

907.3.1.5 907.3.3.1 Group R-1 hotels and motels. An automatic or manual fire alarm system that activates the occupant notification system in accordance with Section 907.6 shall be installed in existing Group R-1 hotels and motels more than three stories or with more than 20 dwelling units or sleeping units.

Exception: Buildings less than two stories in height where all dwelling units or sleeping units, attics and crawl spaces are separated by 1-hour fire-resistance-rated construction and each dwelling unit or sleeping unit has direct access to a public way, exit court or yard.

907.3.1.6 907.3.3.2 Group R-1 boarding and rooming houses. An automatic or manual fire alarm system that activates the occupant notification system in accordance with Section 907.6 shall be installed in existing Group R-1 boarding and rooming houses.

Exception: Buildings that have single-station smoke alarms meeting or exceeding the requirements of Section 907.2.10.1 and where the fire alarm system includes at least one manual fire alarm box per floor arranged to initiate the alarm.

907.3.1.7 907.3.3.3 Group R-2. An automatic or manual fire alarm system that activates the occupant notification system in accordance with Section 907.6 shall be installed in existing Group R-2 occupancies more than three stories in height or with more than 16 dwelling units or sleeping units.

Exceptions:

1. Where each living unit is separated from other contiguous living units by fire barriers having a fire-resistance rating of not less than 0.75 hour, and where each living unit has either its own independent exit or its own independent stairway or ramp discharging at grade.
2. A separate fire alarm system is not required in buildings that are equipped throughout with an approved supervised automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2 and having a local alarm to notify all occupants.
3. A fire alarm system is not required in buildings that do not have interior corridors serving dwelling units and are protected by an approved automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2, provided that dwelling units either have a means of egress door opening directly to an exterior exit access that leads directly to the exits or are served by open-ended corridors designed in accordance with Section 1023.6, Exception 4.

~~907.3.1.8~~ **907.3.3.4 Group R-4.** An automatic or manual fire alarm system that activates the occupant notification system in accordance with Section 907.6 shall be installed in existing Group R-4 residential care/assisted living facilities.

Exceptions:

1. Where there are interconnected smoke alarms meeting the requirements of Section 907.2.10 and there is at least one manual fire alarm box per floor arranged to sound continuously the smoke alarms.
2. Other manually activated, continuously sounding alarms approved by the fire code official.

~~907.3.2~~ **9097.3.4 Single- and multiple-station smoke alarms.** Single- and multiple-station smoke alarms shall be installed in existing Group R occupancies in accordance with Sections ~~907.3.2.1~~ 907.3.4.1 through ~~907.3.2.3~~ 907.3.4.3.

~~907.3.2.1~~ **907.3.4.1 General Where required.** Existing Group R occupancies not already provided with single-station smoke alarms shall be provided with approved single-station smoke alarms. Installation shall be in accordance with Section 907.2.10, except as provided in Sections ~~907.3.2.2~~ 907.3.4.2 and ~~907.3.2.3~~ 907.3.4.3.

~~907.3.2.2~~ **907.3.4.2 Interconnection.** Where more than one smoke alarm is required to be installed within an individual dwelling unit or sleeping unit in Group R-1, R-2, R-3 or R-4, or within an individual sleeping unit in Group R-4, the smoke alarms shall be interconnected in such a manner that the activation of one alarm will activate all of the alarms in the individual unit. The alarm shall be clearly audible in all bedrooms over background noise levels with all intervening doors closed.

Exceptions:

1. Interconnection is not required in buildings that are not undergoing alterations, repairs or construction of any kind.
2. Smoke alarms in existing areas are not required to be interconnected where alterations or repairs do not result in the removal of interior wall or ceiling finishes exposing the structure, unless there is an attic, crawl space or basement available which could provide access for interconnection without the removal of interior finishes.

~~907.3.2.3~~ **907.3.4.3 Power source.** In Group R occupancies, single-station smoke alarms shall receive their primary power from the building wiring provided that such wiring is served from a commercial source and shall be equipped with a battery backup. Smoke alarms with integral strobes that are not equipped with battery back-up shall be connected to an emergency electrical system. Smoke alarms shall emit a signal when the batteries are low. Wiring shall be permanent and without a disconnecting switch other than as required for overcurrent protection.

Exception: Smoke alarms are permitted to be solely battery operated: in existing buildings where no construction is taking place; in buildings that are not served from a commercial power source; and in existing areas of buildings undergoing alterations or repairs that do not result in the removal of interior walls or ceiling finishes exposing the structure, unless there is an attic, crawl space or basement available which could provide access for building wiring without the removal of interior finishes.

~~907.4 Manual fire alarm boxes.~~ (Relocated to Section 907.5.2)

~~907.4.1 Location.~~ (Relocated to Section 907.5.2.1)

~~907.4.2 Height.~~ (Relocated to Section 907.5.2.2)

~~907.4.3 Color.~~ (Relocated to Section 907.5.2.3)

~~907.4.4 Signs.~~ (Relocated to Section 907.5.2.4)

~~907.4.5 Protective covers.~~ (Relocated to Section 907.5.2.5)

~~907.5 Power supply.~~ (Relocated to Section 907.7.2)

~~907.6 Wiring.~~ (Relocated to Section 907.7.1)

~~907.7 Activation.~~ (Relocated to Section 907.6)

~~907.8 Presignal system.~~ (Relocated to Section 907.6.1)

~~907.9 Zones.~~ (Relocated to Section 907.7.3)

~~907.9.1 Zoning indicator panel.~~ (Relocated to Section 907.7.3.1)

~~907.9.2 High-rise buildings.~~ (Relocated to Section 907.7.3.2)

~~907.10 Alarm notification appliances.~~ (Relocated to Section 907.6.2)

~~907.10.1 Visible alarms.~~ (Relocated to Section 907.6.2.3)

~~907.10.1.1 Public and common areas.~~ (Relocated to Section 907.6.2.3.1)

~~907.10.1.2 Employee work areas.~~ (Relocated to Section 907.6.2.3.2)

~~907.10.1.3 Groups I-1 and R-1.~~ (Relocated to Section 907.6.2.3.3)

~~Table 907.10.1.3 Visible and Audible Alarms~~ (Relocated to Table 907.6.2.3.3)

~~907.10.1.4 Group R-2.~~ (Relocated to Section 907.6.2.3.4)

~~907.10.2 Audible alarms.~~ (Relocated to Section 907.6.2.1)

907.11 907.4 Fire safety functions. Automatic fire detectors utilized for the purpose of performing fire safety functions shall be connected to the building's fire alarm control panel unit where a fire alarm system is required by Section 907.2 provided. Detectors shall, upon actuation, perform the intended function and activate the alarm notification appliances or activate a visible and audible supervisory signal at a constantly attended location. In buildings not required to be equipped with a fire alarm system, the automatic fire detector shall be powered by normal electrical service and, upon actuation, perform the intended function. The detectors shall be located in accordance with NFPA 72.

907.12 907.4.1 Duct smoke detectors. Duct smoke detectors shall be connected to the building's fire alarm control panel unit when a fire alarm system is provided. Activation of a duct smoke detector shall initiate a visible and audible supervisory signal at a constantly attended location. Duct smoke detectors shall not be used as a substitute for required open area detection.

Exceptions:

1. The supervisory signal at a constantly attended location is not required where duct smoke detectors activate the building's alarm notification appliances.
2. In occupancies not required to be equipped with a fire alarm system, actuation of a smoke detector shall activate a visible and an audible signal in an approved location. Smoke detector trouble conditions shall activate a visible or audible signal in an approved location and shall be identified as air duct detector trouble.

~~907.13 Access.~~ (Relocated to Section 907.7.4)

~~907.14 Fire extinguishing systems.~~ (Relocated to Section 907.6(4))

~~907.15 Monitoring.~~ (Relocated to Section 907.7.5)

~~907.16 Automatic telephone dialing devices.~~ (Relocated to Section 907.7.5.1)

~~907.17 Acceptance tests.~~ (Relocated to Section 907.8)

~~907.18 Record of completion.~~ (Relocated to Section 907.8.2)

~~907.19 Instructions.~~ (Relocated to Section 907.8.3)

~~907.20 Inspection, testing and maintenance.~~ (Relocated to Section 907.9)

~~907.20.1 Maintenance required.~~ (Relocated to Section 907.9.1)

~~907.20.2 Testing.~~ (Relocated to Section 907.9.2)

~~907.20.3 Detection sensitivity.~~ (Relocated to Section 907.9.3)

~~907.20.4 Method.~~ (Relocated to Section 907.9.4)

~~907.20.4.1 Testing device.~~ (Relocated to Section 907.9.4.1)

~~907.20.5 Maintenance, inspection and testing.~~ (Relocated to Section 907.9.5)

907.2.15 907.4.2 Delayed egress locks. Where delayed egress locks are installed on means of egress doors in accordance with Section 1008.1.8.6, an automatic smoke or heat detection system shall be installed as required by that section.

907.4.3 Elevator emergency operation. Automatic fire detectors installed for elevator emergency operation shall be installed in accordance with the provisions of ASME A17.1 and NFPA 72.

907.4.4 Wiring. The wiring to the auxiliary devices and equipment used to accomplish the above fire safety functions shall be monitored for integrity in accordance with NFPA 72.

907.5 Initiating devices. Where manual or automatic alarm initiation is required as part of a fire alarm system, the initiating devices shall be installed in accordance with Sections 907.5.1 through 907.5.4.

907.5.1 Protection of fire alarm control unit. In areas that are not continuously occupied, a single smoke detector shall be provided at the location of each fire alarm control unit.

Exception: Where ambient conditions prohibit installation of smoke detector, a heat detector shall be permitted.

907.4 ~~907.5.2~~ Manual fire alarm boxes. ~~Where a manual fire alarm system is required by another section of this code, it shall be activated by fire alarm boxes shall be installed in accordance with Sections 907.4.1- 907.5.2.1 through 907.4.5 907.5.2.5.~~

907.4.1 ~~907.5.2.1~~ Location. Manual fire alarm boxes shall be located not more than 5 feet (1524 mm) from the entrance to each exit. Additional manual fire alarm boxes shall be located so that travel distance to the nearest box does not exceed 200 feet (60 960 mm).

907.4.2 ~~907.5.2.2~~ Height. The height of the manual fire alarm boxes shall be a minimum of 42 inches (1067 mm) and a maximum of 48 inches (1372 mm) measured vertically, from the floor level to the activating handle or lever of the box.

907.4.3 ~~907.5.2.3~~ Color. Manual fire alarm boxes shall be red in color.

907.4.4 ~~907.5.2.4~~ Signs. Where fire alarm systems are not monitored by a supervising station, an approved permanent sign shall be installed adjacent to each manual fire alarm box that reads: WHEN ALARM SOUNDS—CALL FIRE DEPARTMENT.

Exception: Where the manufacturer has permanently provided this information on the manual fire alarm box.

907.4.5 ~~907.5.2.5~~ Protective covers. The fire code official is authorized to require the installation of listed manual fire alarm box protective covers to prevent malicious false alarms or to provide the manual fire alarm box with protection from physical damage. The protective cover shall be transparent or red in color with a transparent face to permit visibility of the manual fire alarm box. Each cover shall include proper operating instructions. A protective cover that emits a local alarm signal shall not be installed unless approved. Protective covers shall not project more than that permitted by Section 1003.3.3 of the *International Building Code*.

907.5.3 Automatic detection. The automatic fire detectors shall be smoke detectors. Where ambient conditions prohibit installation of smoke detectors, other approved automatic fire detection shall be permitted. Where automatic sprinkler protection installed in accordance with Section 903.3.1.1 or 903.3.1.2 is provided and connected to the building fire alarm system, automatic heat detection required by this section shall not be required.

907.7 Activation ~~907.6~~ Alarm notification systems. A fire alarm system shall annunciate at the panel and shall initiate occupant notification upon activation, in accordance with this section. Where an a fire alarm notification system is required by another section of this code provided, it shall be activated by:

1. Required Automatic fire alarm system detectors.
2. Sprinkler water-flow devices.
3. Required Manual fire alarm boxes.
4. Automatic fire-extinguishing systems.

Exceptions:

1. Occupant notification is not required for fire detectors used to control fire safety functions in accordance with Section 907.4.
2. Where notification systems are permitted elsewhere in this section to annunciate at a constantly attended location.
3. Where a dedicated function fire alarm system is installed exclusively to transmit waterflow signals to a remote monitoring location, a single audible alarm notification device, in accordance with Section 903.4.2, shall be installed in the vicinity of the manual fire alarm box to activate upon detection of waterflow or upon activation of the manual fire alarm box.

907.8 ~~907.6.1~~ Presignal system feature. Presignal systems feature shall not be installed unless approved by the fire code official and the fire department. Where a presignal system feature is installed provided, 24-hour personnel supervision shall be provided at a signal shall be annunciated at a constantly attended location approved by the fire department, in order that the alarm signal occupant notification can be actuated activated in the event of fire or other emergency.

907.10 ~~907.6.2~~ Alarm notification appliances. Alarm notification appliances shall be provided and shall be listed for their purpose.

907.10.2 907.6.2.1 Audible alarms. Audible alarm notification appliances shall be provided and sound a distinctive sound that is not to be used for any purpose other than that of a fire alarm.

Exception: Visible alarm notification appliances shall be allowed in lieu of audible alarm notification appliances in critical care areas of Group I-2 occupancies.

907.10.2 907.6.2.1.1 Average sound pressure. The audible alarm notification appliances shall provide a sound pressure level of 15 decibels (dBA) above the average ambient sound level or 5 dBA above the maximum sound level having a duration of at least 60 seconds, whichever is greater, in every occupied space within the building. The minimum sound pressure levels shall be: ~~70~~ 75 dBA in occupancies in Groups R and I-1; 90 dBA in mechanical equipment rooms; and 60 dBA in other occupancies.

907.10.2 907.6.2.1.2 Maximum sound pressure. The maximum sound pressure level for audible alarm notification appliances shall be ~~120~~ 110 dBA at the minimum hearing distance from the audible appliance. Where the average ambient noise is greater than 105 dBA, visible alarm notification appliances shall be provided in accordance with NFPA 72 and audible alarm notification appliances shall not be required.

907.2.12.2.3 Standard. 907.6.2.2 Emergency voice/alarm communication system. The emergency voice/alarm communication system shall be designed and installed in accordance with NFPA 72. ~~907.2.12.2 Emergency voice/alarm communication system.~~ The operation of any automatic fire detector, sprinkler water-flow device or manual fire alarm box shall automatically sound an alert tone followed by voice instructions giving approved information and directions for a general or staged evacuation on a minimum of the alarming floor, the floor above and the floor below in accordance with the building's fire safety and evacuation plans required by Section 404. Speakers shall be provided throughout the building by paging zones. As a minimum, paging zones shall be provided as follows:

1. Elevator groups.
2. Exit stairways.
3. Each floor.
4. Areas of refuge as defined in Section 1002.1.

907.2.12.2.4 907.6.2.2.1 Manual override. A manual override for emergency voice communication shall be provided on a selective and all-call basis for all paging zones.

907.2.12.2.2 907.6.2.2.2 Live voice messages. The emergency voice/alarm communication system shall also have the capability to broadcast live voice messages ~~through~~ by paging zones on a selective and all-call basis.

907.2.1.2 907.6.2.2.3 Emergency power. Emergency voice/alarm communications systems shall be provided with an approved emergency power source.

907.10.4 907.6.2.3 Visible alarms. Visible alarm notification appliances shall be provided in accordance with Sections ~~907.10.4.4~~ 907.6.2.3.1 through ~~907.10.4.4~~ 907.6.2.3.4.

Exceptions:

1. Visible alarm notification appliances are not required in alterations, except where an existing fire alarm system is upgraded or replaced, or a new fire alarm system is installed.
2. Visible alarm notification appliances shall not be required in exits as defined in Section 1002.1.

907.10.4.4 907.6.2.3.1 Public and common areas. Visible alarm notification appliances shall be provided in public areas and common areas.

907.10.4.2 907.6.2.3.2 Employee work areas. Where employee work areas have audible alarm coverage, the notification appliance circuits serving the employee work areas shall be initially designed with a minimum of 20 percent spare capacity to account for the potential of adding visible notification appliances in the future to accommodate hearing impaired employee(s).

907.10.4.3 907.6.2.3.3 Groups I-1 and R-1. Group I-1 and R-1 dwelling units or sleeping units in accordance with Table ~~907.10.4.3~~ 907.6.2.3.3 shall be provided with a visible alarm notification appliance, activated by both the in-room smoke alarm and the building fire alarm system.

**TABLE 907.10.1.3 907.6.2.3.3
VISIBLE AND AUDIBLE ALARMS**

NUMBER OF SLEEPING UNITS	SLEEPING ACCOMMODATIONS WITH VISIBLE AND AUDIBLE ALARMS
6 to 25	2
26 to 50	4
51 to 75	7
76 to 100	9
101 to 150	12
151 to 200	14
201 to 300	17
301 to 400	20
401 to 500	22
501 to 1,000	5% of total
1,001 and over	50 plus 3 for each 100 over 1,000

907.10.1.4 907.6.2.3.4 Group R-2. In Group R-2 occupancies required by Section 907 to have a fire alarm system, the notification appliance circuits serving all dwelling units and sleeping units shall be initially designed with a minimum of 20% spare provided with the capability to support visible alarm notification appliances in accordance with ICC A117.1.

907.7 Installation. A fire alarm system shall be installed in accordance with this section and NFPA 72.

907.6 907.7.1 Wiring. Wiring shall comply with the requirements of the ICC *Electrical Code* and NFPA 72. Wireless protection systems utilizing radio-frequency transmitting devices shall comply with the special requirements for supervision of low-power wireless systems in NFPA 72.

907.5 907.7.2 Power supply. The primary and secondary power supply for the fire alarm system shall be provided in accordance with NFPA 72.

Exception: Back-up power for single-station and multiple-station smoke alarms as required in Sections 907.2.10.4 and 907.3.4.3.

907.9 907.7.3 Zones. Each floor shall be zoned separately and a zone shall not exceed 22,500 square feet (2090 m²). The length of any zone shall not exceed 300 feet (91 440 mm) in any direction.

Exception: Automatic sprinkler system zones shall not exceed the area permitted by NFPA 13.

907.9.1 907.7.3.1 Zoning indicator panel. A zoning indicator panel and the associated controls shall be provided in an approved location. The visual zone indication shall lock in until the system is reset and shall not be canceled by the operation of an audible-alarm silencing switch.

907.9.2 907.7.3.2 High-rise buildings. In buildings with a floor used for human occupancy that is located more than 75 feet (22 860 mm) above the lowest level of fire department vehicle access, a separate zone by floor shall be provided for all of the following types of alarm-initiating devices where provided:

1. Smoke detectors.
2. Sprinkler water-flow devices.
3. Manual fire alarm boxes.
4. Other approved types of automatic fire detection devices or suppression systems.

907.13 907.7.4 Access. Access shall be provided to each detector for periodic inspection, maintenance and testing.

907.15 907.7.5 Monitoring. Fire alarm systems required by this chapter or by the *International Building Code* shall be monitored by an approved supervising station in accordance with NFPA 72.

Exception: Supervisory service Monitoring by a supervising station is not required for:

1. Single- and multiple-station smoke alarms required by Section 907.2.10.
2. Smoke detectors in Group I-3 occupancies.
3. Automatic sprinkler systems in one- and two-family dwellings.

907.16 907.7.5.1 Automatic telephone-dialing devices. Automatic telephone-dialing devices used to transmit an emergency alarm shall not be connected to any fire department telephone number unless approved by the fire chief.

907.17 907.8 Acceptance tests and completion. Upon completion of the installation, of the fire alarm system, alarm notification appliances and circuits, alarm initiating devices and circuits, supervisory signal initiating devices and circuits, signaling line circuits, and primary and secondary power supplies and all fire alarm components shall be tested in accordance with NFPA 72.

907.2.10.4 Acceptance testing 907.8.1 Single- and multiple-station alarm devices. When the installation of the alarm devices is complete, each detector device and interconnecting wiring for multiple-station alarm devices shall be tested in accordance with the household fire warning equipment smoke alarm provisions of NFPA 72.

907.18 907.8.2 Record of completion. A record of completion in accordance with NFPA 72 verifying that the system has been installed and tested in accordance with the approved plans and specifications shall be provided.

907.19 907.8.3 Instructions. Operating, testing and maintenance instructions and record drawings ("as built") and equipment specifications shall be provided at an approved location.

907.20 907.9 Inspection, testing and maintenance. The maintenance and testing schedules and procedures for fire alarm and fire detection systems shall be in accordance with this section and Chapter 10 of NFPA 72.

907.20.1 907.9.1 Maintenance required. Whenever or wherever any device, equipment, system, condition, arrangement, level of protection or any other feature is required for compliance with the provisions of this code, such devices, equipment, systems, conditions, arrangements, levels of protection or other feature shall thereafter be continuously maintained in accordance with applicable NFPA requirements or as directed by the fire code official.

907.20.2 907.9.2 Testing. Testing shall be performed in accordance with the schedules in Chapter 10 of NFPA 72 or more frequently where required by the fire code official. Where automatic testing is performed at least weekly by a remotely monitored fire alarm control unit specifically listed for the application, the manual testing frequency shall be permitted to be extended to annual.

Exception: Devices or equipment that are inaccessible for safety considerations shall be tested during scheduled shutdowns where approved by the fire code official, but not less than every 18 months.

907.20.3 907.9.3 Smoke detector sensitivity. Smoke detector sensitivity shall be checked within one year after installation and every alternate year thereafter. After the second calibration test, where sensitivity tests indicate that the detector has remained within its listed and marked sensitivity range (or 4-percent obscuration light grey smoke, if not marked), the length of time between calibration tests shall be permitted to be extended to a maximum of five years. Where the frequency is extended, records of detector-caused nuisance alarms and subsequent trends of these alarms shall be maintained. In zones or areas where nuisance alarms show any increase over the previous year, calibration tests shall be performed.

907.20.4 907.9.4 Method. To ensure that each smoke detector is within its listed and marked sensitivity range, it shall be tested using either a calibrated test method, the manufacturer's calibrated sensitivity test instrument, listed control equipment arranged for the purpose, a smoke detector/control unit arrangement whereby the detector causes a signal at the control unit where its sensitivity is outside its acceptable sensitivity range or other calibrated sensitivity test method acceptable to the fire code official. Detectors found to have a sensitivity outside the listed and marked sensitivity range shall be cleaned and recalibrated or replaced.

Exceptions:

1. Detectors listed as field adjustable shall be permitted to be either adjusted within the listed and marked sensitivity range and cleaned and recalibrated or they shall be replaced.
2. This requirement shall not apply to single-station and multiple-station smoke alarms.

907.20.4.1 907.9.4.1 Testing device. Smoke detector sensitivity shall not be tested or measured using a device that administers an unmeasured concentration of smoke or other aerosol into the detector.

907.20.5 907.9.5 Maintenance, inspection and testing. The building owner shall be responsible for ensuring that the fire and life safety systems are maintained to maintain the fire and life safety systems in an operable condition at all times. Service personnel shall meet the qualification requirements of NFPA 72 for maintaining, inspecting and testing such systems. A written record shall be maintained and shall be made available to the fire code official.

PART II – IBC

Add new text as follows:

(IBC) 907.3 Existing buildings. Fire alarm systems to be installed in existing buildings shall be in accordance with this code and the *International Existing Building Code* and the *International Fire Code*.

(No other subsections are intended to be added under 907.3 in the IBC)

Reason: To clarify the fire alarm provisions and add limited technical revisions that will aid in providing clarity to the code. The general organization of the reformatted 907 section is as follows:

- 907.1 General
- 907.2 Requirements for new buildings
- 907.3 Requirements for existing buildings
- 907.4 Requirements for special functions
- 907.5 Initiating devices
- 907.6 Notification Devices
- 907.7 Installation requirements
- 907.8 Acceptance testing
- 907.9 Inspection, testing and maintenance

Section 907 evolved as an amalgamation of the three legacy codes. In the process, it absorbed formatting issues from each in a different manner. The charging statement for each Occupancy Group is inconsistent. The text that indicates what is required is inconsistent. And, the general arrangement of text, although in a logical format, is not consistent with the way many people approach the code. It is certainly not consistent with the way that Section 903 is organized. The proposal is an effort made by a group of people from various segments of the industry and code application to correlate, reformat and generally improve usability of the code. Before addressing the technical and formatting changes involved in the proposal, it is worth noting appreciation to the people who helped work on this effort. In alphabetical order:

Bill Aaron (Code Consultants, Inc.),
Diane Arend (Office of the State Fire Marshal; California),
Gene Boecker (Code Consultants, Inc),
Shane Clary (Bay Alarm)
John Guhl (Office of the State Fire Marshal; California),
Tom Hammerberg (Automatic Fire Alarm Association, Inc),
Bill Hopple (SimplexGrinnel),
Dave Lowrey (Fire Rescue; City of Boulder),
Dan Nichols (Building Codes Division; State of New York),
Jon Nisja (State Fire Marshal Division; Minnesota),
Brit Rockafellow (Building Project Review, San Diego),
Jimbo Schiffiliti (Fire Safety Consultants, Inc),
Dave Stringfield (University of Minnesota)

This is one in a series of code changes. This one incorporates all the formatting changes and all the technical changes. It is hoped that this would be heard first; and, if acceptable recommended for approval by the committee. Otherwise, there are alternative code change proposals being submitted that divide the overall proposal into reformatting and various technical proposals.

PART I – IFC

The following is a section by section description of what was changed in each, followed by a comparison matrix indicating what the old section numbers are and what the new, proposed sections numbers would be. Due to the reformatting, reference is made to the proposed, new section number. Because the text is mostly the same in both the IBC and the IFC, only a single statement is offered and the differences identified as necessary.

907.1 – The paragraph was divided and itemized for quicker visual reference to requirements for new and existing buildings.

907.1.1 The term “construction drawings” is too generic. The type of information noted in the list is what is submitted with “shop drawings.” Whether the jurisdiction requires shop drawings to be submitted at the time of permit application is irrelevant. There is confusion over whether or not the information is required on the contract documents prepared by the architects and engineers or whether it is prepared by the designer of the fire alarm system. The term Shop drawing is the proper term. #3 The terminology was changed to be more consistent with that used in NFPA 72. #4 Annunciation is the action that occurs and is simply called “occupant notification.” The intent is to identify where the Annunciator panels may be located so that coordination with the fire service needs can occur. #9 The name of the manufacturer is what the code literally requires as written. What is actually requested and provided are data sheets from the manufacturers about their products. The data sheets contain the manufacturer’s information as well as detailed descriptions of the products. #12 This is a new item to the list. One question that seems to be asked regularly but is not previously identified as being required is the supervising station information. Now it will be required to submit what firm will be performing the supervising and what type of supervision will be done.

907.1.2 It is possible to have fire alarm equipment that is not part of a “system” as defined by the code. Therefore the word “their” can be deleted.

907.2 Section renumbering is intended to relate to what is done elsewhere in this proposal. The first sentence is deleted because there is no place in 907 that requires heat detection. Therefore the sentence is extraneous. The second deleted sentence is moved to the new section 907.5.3 because it has more to do with the initiating devices than to “new construction.”

This manual fire alarm box is needed to provide a means of manually activating a fire alarm system that only contains automatic devices like waterflow switches or smoke detectors. It serves two purposes. One is for the sprinkler technician to be able to manually activate the fire alarm system in the event of a fire during the time the sprinkler system is down for maintenance. The second purpose is to allow building occupants a means to manually active the fire alarm system prior to sprinkler water discharge in the event a fire is discovered. The NFPA 72 Protected Premises Technical Committee feels this requirement belongs in building and fire codes rather than in NFPA 72. NFPA 72 provides the “how to” for fire alarm devices required by building and fire codes. Building and fire codes provide the “when required”. This requirement will be removed from NFPA 72 once it is in the building and fire codes.

907.2.1 The code now clearly indicates that occupant notification is required. It had been assumed and is noted in the commentaries as being the understood response but it never clearly stated that in the code. It is also intimated in the definition but is not clear since there are systems in the code that do not require full occupant notification. The added text removes the ambiguity. This additional text is added in several locations throughout the code

In the exception, the term “alarm notification” technically only indicates that the alarm condition is recognized at the panel. It does not mean that horns and strobes will be activated. “Occupant notification” is the term used to describe that function. The added words “within the notification zones” are provided so that it is clear to what extent the notification should occur. While there is a general understanding about what devices should activate, the revised language clarifies the intent.

907.2.1.1 The reference to NFPA is removed from this section. It is included in the new Section 907.6.2.2. The existing section 907.2.1.2 is deleted because the requirement is included in the new Section 907.6.2.2.3. Because the voice alarm system is part of the fire alarm system, it is subject to 907.2 which requires emergency and standby power to be in accordance with NFPA 72.

907.2.2 The paragraph is divided into various conditions. This is similar to the manner in which Section 903 is organized and makes for easier identification of the various conditions; both in reading and citation. This approach is used throughout the reorganization as a general reformatting concept for clarity. In so doing, the language in item one needed to be changed to make sense and additional language in item two added for clarity

The text change in the exception is the same as that noted for Section 907.2.1. The code now clearly indicates that occupant notification is required. See rationale statement for Section 907.2.1.

907.2.3, Exception #1 To clarify a potential misunderstanding, the wording is added so that it is clear that the exception applies to the manual fire alarm system and not the connection referred to in the charging sentence. Exception #2.1 Alarm Verification is a term that is no longer used.

Exception #2.2 The wording “the like” is vague. While “similar areas” does not give specific information, it is consistent with code language and better than the alternative – keeping “the like.” Exception #2.4 The phrase “off-premises” is not consistent with NFPA 72 terminology. The code requires that all fire alarm systems must be supervised. Therefore, the intent is provided without any need for this requirement. The text is consequently extraneous and can be deleted.

907.2.4 The section is divided and language changed for clarity. See rationale statement for Section 907.2.2. The code now clearly indicates that occupant notification is required. See rationale statement for Section 907.2.1.

907.2.5 (No change)

907.2.6 There is no reason for the wording “electrically supervised” since all smoke detection systems must be supervised by a method using electricity.

907.2.6.1 The charging statement is reworded to be in the positive and ordered in a similar manner to the other sections in 907.2. The reorganization also eliminates a confusion over whether or not the term “habitable” was intended to be applied to the other spaces in the list.

907.2.6.1.1 A new section is added as a pointer to the smoke alarm requirement for Group I-1 occupancies. As it is currently written, the reader does not find out about smoke alarms for I occupancies until reading the section for residential occupancies. This will point out the requirement.

907.2.6.2 – Similar to Section 907.6.1, the text is reworded to be in the positive and consistent with language used elsewhere in Section 907.2.

907.2.6.3 (No change)

907.2.6.3.1 The sentence regarding presignal systems is removed because the sentence preceding it is describing a presignal feature. The existing second sentence contradicts the first sentence. Because the staff notification feature is both desirable and consistent with the Life Safety Code, the second sentence is not necessary.

907.2.6.3.2 The only change is intended to revise the section number reference to be the proper one since the latter section numbers are revised.

907.2.6.3.3 The word “approved” is extraneous in this sense because all fire alarm systems require an approval through the permit process. The word adds nothing of value to the code in this use. This deletion occurs twice – once in the charging paragraph and once again in exception #3.

907.2.7 –The charging paragraph is divided in similar fashion to that noted above (see 907.2.2). The phrase stating what the manual system should activate is relocated to be still in the charging portion of the text. Language changes in the exceptions are the same as those in Section 907.2.2 and for the same reasons. The code now clearly indicates that occupant notification is required. See rationale statement for Section 907.2.1.

907.2.7.1 The referenced section is changed because the voice alarm section is proposed to be relocated. Otherwise, there is no change.

907.2.8 Smoke alarms are added to the charging language. While the requirement for smoke alarms is found in the following sections there is currently nothing in the charging text acknowledging it.

907.2.8.1 The code now clearly indicates that occupant notification is required. See rationale statement for Section 907.2.1. Two changes are proposed to exception one – both for clarity. The phrase “to those units” is proposed so that it is clear that the crawl spaces of interest are those associated with the units where the exception would be applied and not elsewhere in the building. The second change is to include dwelling units in the description for R-1 occupancies. While the typical assumption for an R-1 occupancy is the hotel room, many transient housing units now include cooking facilities and would therefore be called dwelling units. These types of units include extended stay units and weekly time-share rental properties. Hence, it is necessary to include the term dwelling unit and apply it as necessary for R-1 units as well as R-2 units.

907.2.8.2 The code now clearly indicates that occupant notification is required. See rationale statement for Section 907.2.1. There are also two changes to this section. Similar to 907.2.8.1, wording is added for dwelling units. Additionally, it is necessary to indicate that the egress door could lead directly into an exit as well as to an exterior exit access. In compressed site designs, it is not uncommon for the alternative route to be an exit enclosure rather than an exterior balcony. And, if the path leads directly into an exit, that should be counted as at least equal to an exterior balcony.

907.2.8.3 In the first sentence “single- and multiple-station” is added in association with smoke alarms so that it is clear that the requirements in 907.2.10 apply to both conditions. The other change to this sentence is to make it read consistent with other sections of the code. The second sentence is no longer necessary since all new construction for residential occupancies is required to be sprinklered.

907.2.9 In order that the requirements the manual fire alarm system and for smoke alarms can be divided, a new charging sentence is proposed. This is consistent with the format for Section 903 and helps the reader distinguish between code provisions.

907.2.9.1 A new title is added for the split off section. The code now clearly indicates that occupant notification is required. See rationale statement for Section 907.2.1.

Existing Exception #1 The essence of this exception has to do with buildings that do not have interior corridors. The criterion for 1-hour separation is a requirement regardless, so it can be deleted. What is left is the limitation that the exception applies to buildings not more than two-stories in height. That criterion is inserted in to exception #3. When the old exception #1 is deleted, the old exception #2 becomes the new exception #1.

New Exception #1 Since the building must be sprinklered reference to sprinklers can be deleted as extraneous. The word “water” is added so that the phrase “water flow” is consistent with that used elsewhere in the code.

New Exception #2 because sprinklers are required in all residential occupancies, the reference to sprinklers can be deleted. The rest of the exception is so similar to the old exception #1 that the two-story limitation was relocated to this exception. The two-story provision with an exterior exit access is the only thing that makes this exception different from the new Exception #1. For practical purposes it could also be deleted since the sprinkler exception in #1 covers the issue completely. The exception was retained in case there was a situation where sprinkler protection may be waived.

907.2.9.2 A new pointer section is added that directs the reader to the requirement for smoke alarms in Group R-2 occupancies.

907.2.10 Charging language from the old 907.10.1 was relocated into this section to make it the charging section. The reference to household fire warning devices is deleted since the term used in NFPA is “smoke alarm.” If the same term is used, it is already clear what the intent is when applying NFPA 72.

907.2.10.1 The old 907.10.1.1 is now the first section relating to smoke alarms. The addition of the terms dwelling units is explained in the substantiation for Section 907.2.8.1 above.

907.2.10.2 The exception added to item #2 is taken from the existing 907.2.10.1.3. The existing 907.2.10.1.3 relates to only item #2 in this list. This way all the provisions are located in the same place instead of two sections. Therefore, the existing 907.2.10.1.3 can be deleted.

907.2.10.3 Consistent with the application in 907.2.8.1 and elsewhere, if dwelling units can also apply to Group R-1 occupancies then there is no reason to segregate the occupancy in the text.

907.2.10.4 The section is renumbered due to the change in the charging section. A sentence is added in recognition of a concern raised by NFPA 72. Reference to Group R-1 is proposed to be deleted since the concept is applicable to all cases where a smoke alarm is required.

At the present time, there are on the market smoke alarms that have an integral strobe that do not have a built in battery for the strobe. Thus, if the power for the building goes down, while the smoke detection and horn of the device may still operate, the strobe will not. It is critical for rooms that are equipped with these smoke alarms that may house the hearing impaired that depend on the strobe to alert them to the alarm. The proposed change to 907.2.10.4 would require that a smoke alarm with an integral strobe that does not have a battery backup would be required to be connected to an emergency electrical system for the required backup power. The section has been changed to 907.2.10.4 to be in alignment with the proposed changes to Section 907 that are part of this submittal.

907.2.11 The word “approved” can be deleted since all alarm systems must be reviewed and approved. In the exception the word “fire” is added to differentiate between what type of alternate detector is allowed should smoke detectors not be appropriate for the ambient conditions. It is not clear in the present text whether or not a pressure sensitive detonation detector could be used as an alternative. The intent is that a fire detector be used.

907.2.11.1 (No change)

907.2.11.2 The paragraph after the list is also a part of the required functions. It is proposed to insert the text as a fourth function in the list and rephrase the text to be consistent with the way that the list is worded. The sentence relative to wiring is generic to all types of fire alarm systems. It is not necessary to repeat it here. The same provision is already located in NFPA 72.

907.2.11.3 The reference to NFPA 72 is deleted since it is more appropriate to refer to the code sections that specifically address the system function. NFPA 72 gives information as to how the voice alarm system should be installed but leaves options since it is primarily an installation document. Without the reference to 907.6.2.2 it is unclear what functions should be provided for a voice alarm in a special amusement building.

907.2.12 –The referenced section is changed from 907.2.12.2 to 907.6.2.2 because the provisions are moved to that new location. This is discussed further in Section 907.6.2.2. Exception #6 is moved from Section 907.2.12.2. It was unclear in its current location whether the exception applies to the last item in the list or to the entire section. This clarifies the issue. Additionally, providing the exception in this section means that the question of voice alarm for high-rise I-1 and I-2 occupancies can be settled before the need to read through the voice alarm requirement sections. The exception should be associated with the charging section.

907.2.12.1 The word “listed” can be deleted since it is already a requirement by definition that smoke detectors must be listed.

907.2.12.2 The existing 907.2.12.2 (and subordinate) sections are proposed to be relocated to a new 907.6.2.2 section with subordinate sections. See Section 906.2.2 for additional rationale. Therefore, the existing 907.2.12.3 becomes the proposed 907.2.12.2 – without any changes.

907.2.12.3 The section is renumbered.

907.2.13 The code now clearly indicates that occupant notification is required. See rationale statement for Section 907.2.1. Code section references are changed due to the relocation of text. It is the intent that the references point to the same text as in the existing code arrangement.

907.2.14 – (No change)

907.2.15 The delayed egress lock section relates to a specific safety function and is proposed to be located in a place with similar requirements. Therefore the existing 907.2.16 becomes the new 907.2.15.

907.2.16 Due to section renumbering, the existing 907.2.17 becomes the new 907.2.16.

907.2.17 –With section renumbering, existing 907.2.18 becomes proposed 907.2.17. The nomenclature is changed from smoke “exhaust” to smoke “control” to be consistent with Section 909 and language used elsewhere in the code. The section becomes the charging section for all underground buildings. (See 907.2.17.3)

907.2.17.1 Other than the section renumbering, nothing is changed.

907.2.17.2 The wording is changed to read smoke “control” system rather than smoke “exhaust” system to be consistent with terminology in Section 909.

907.2.17.3 The existing 907.2.19 addresses requirements for an underground building. The only difference between it and that in the previous section is the depth below grade. Therefore, this section is made to be a subsection of the one addressing underground buildings. The reference section change is due to the relocation of the voice alarm provision.

907.2.17.3.1 No change other than section renumbering.

907.2.18 The section is renumbered due to relocation of requirements and the reference for voice alarms also changes because that provision is relocated.

907.2.19 – The word “listed” is deleted because all smoke detectors and smoke alarms must be listed (see also proposed section 907.2.10). The wording “single-station” is added to provide clarity to the term smoke alarm.

907.2.20 The section is renumbered. The code now clearly indicates that occupant notification is required. See rationale statement for Section 907.2.1. A sentence is added to indicate where smoke detection is required. In airport control towers smoke detectors are provided as part of a package of provisions to supplement the lack of egress because only one exit is required. However, without some direction, smoke detectors could be construed to be required in every closet and underfloor space. The basic intent is to provide notification and early warning but with such a small area limited placement is all that is necessary. Therefore, the proposed text would direct the installation to be in those areas where people work; which are also the areas with the greatest potential fuel source for a fire. This application is consistent with what is being done in most parts of the country and with what the original intent was for the smoke detection requirement.

907.2.21 The section is renumbered due to text relocation. The word “approved” is deleted since all fire alarm systems must be approved. The word “having” is changed to “with” to be consistent with language used elsewhere in the code. The provision for activation of an alarm at a constantly attended location is moved forward in the sentence. Generally, the preferred solution is listed first. The constantly attended location is

the option typically used because it will let people in the vicinity know immediately that there has been an incident so action can be taken immediately. Most of the facilities with this type of battery storage area also have on site fire brigades who can respond faster to the scene than the fire department of the local jurisdiction. The preference and generally accepted method should be listed first in the code.

907.3 – Text is added that discusses occupant notification similar to the charging text for 907.2. Also similar to what is proposed for section 907.2, specific text is relocated or deleted because it is not necessary in a charging section. See also the discussion for Section 907.2.

907.3.1 The existing section is deleted since this information is already included in 907.3. It also makes the format consistent with that of 907.2. The exception to the existing 907.3.1 becomes the exception to 907.3 because it addresses the charging provisions of 907.3. The proposed 907.3.1 has no changes other than the renumbering.

907.3.2 A new scoping statement is added to be similar to that in 907.2.6 for new construction. The same exception for new construction is included in 907.3.2.

907.3.2.1 The existing text states fire alarm system which includes both manual and automatic. The proposed text inserts that language as a starting point from which more descriptive and precise code changes can be proposed in the future. Requirements for an existing Group I-1 occupancy is being reference back to 907.2.6.1 so that the exceptions of that section can also be applied as necessary. Otherwise the requirements for existing building would be more restrictive than those for new construction. The existing exception is retained.

907.3.2.2 The existing text states fire alarm system which includes both manual and automatic. The proposed text inserts that language as a starting point from which more descriptive and precise code changes can be proposed in the future. Requirements for an existing Group I-2 occupancy is being reference back to 907.2.6.2 so that the exceptions of that section can also be applied as necessary. Otherwise the requirements for existing building would be more restrictive than those for new construction.

907.3.2.3 The existing text states fire alarm system which includes both manual and automatic. The proposed text inserts that language as a starting point from which more descriptive and precise code changes can be proposed in the future. Requirements for an existing Group I-3 occupancy is being reference back to 907.2.6.3 so that the exceptions of that section can also be applied as necessary. Otherwise the requirements for existing building would be more restrictive than those for new construction.

907.3.3 A new scoping section is added because there are two sets of requirements for Group R occupancies. This places the section in the same hierarchy as other requirements for existing buildings.

907.3.3.1 The section is renumbered due to relocated text. The code now clearly indicates that occupant notification is required. See rationale statement for Section 907.2.1. The words “manual or automatic” are added because these are both types of fire alarm systems. The change to this framework will allow future revisions to be made to further clarify the intent as necessary. As was done for the provisions for new buildings, the words “dwelling unit” is added because R-1 units can be either sleeping units or dwelling units. (see substantiation for Section 907.2.8.1.)

907.3.3.2 The section is renumbered due to relocated text. The code now clearly indicates that occupant notification is required. See rationale statement for Section 907.2.1. The words “manual or automatic” are added because these are both types of fire alarm systems. The change to this framework will allow future revisions to be made to further clarify the intent as necessary.

907.3.3.3 The section is renumbered due to relocated text. The code now clearly indicates that occupant notification is required. See rationale statement for Section 907.2.1. The words “manual or automatic” are added because these are both types of fire alarm systems. The change to this framework will allow future revisions to be made to further clarify the intent as necessary.

907.3.3.4 The section is renumbered due to relocated text. The code now clearly indicates that occupant notification is required. See rationale statement for Section 907.2.1. The words “manual or automatic” are added because these are both types of fire alarm systems. The change to this framework will allow future revisions to be made to further clarify the intent as necessary.

907.3.4 In addition to the section being renumbered, the references are renumbered so that they point to the same requirements as before. Otherwise, there is no change to this section.

907.3.4.1 The section and referenced sections are renumbered as necessary to point to the same provision. The word “approved” is deleted because all fire alarm systems are required to be approved.

907.3.4.2 Consistent with the application in 907.2.8.1 and elsewhere, if dwelling units can also apply to Group R-1 occupancies then there is no reason to segregate the occupancy in the text.

907.3.4.3 Text is added to address battery back-up as it relates to visual devices, integral to the smoke alarm. See substantiation for 907.2.10.4.

907.4 Formerly Section 907.11. The wording is changed twice to read fire control “unit” rather than panel to be consistent with terminology in NFPA 72. Additionally the wording is proposed to be changed in two places from where “required” to where “provided.” It should not matter whether the fire alarm safety function is required by the code. If it is provided, it should meet certain levels of performance so that it can be expected to function in a manner consistent with its intent. For example, if duct smoke detection is “provided” although the size of the unit is less than what is “required,” it should still perform in a manner expected for that function. Therefore the term used should be provided rather than required.

The following four sections are proposed to be lumped in the same area of Section 907. They all relate to special fire safety functions that are not a part of a general fire alarm system. These include duct detectors, delayed egress locks and elevator recall.

907.4.1 The word “panel” is changed to “unit” to be consistent with the term used in NFA 72.

907.4.2 No change to the section other than the renumbering from 907.2.15 to 907.4.2.

907.4.3 This is a new section written to provide clearer reference to both the Elevator Code and the Fire Alarm Code as the standards for installation. Both of these are standards are currently referenced in the codes so there is no reason to address the question of referenced standards in the substantiation.

907.4.4 The proposed text was a part of the last sentence in current Section 907.2.11.2. However, the intent is applicable to all types of special fire safety functions and should not be limited to only special amusement buildings. If wiring is provided as a part of the installation, it should be monitored for integrity so that it has reasonable reliability.

907.5 This is a new scoping statement. In the current code it is unclear as to whether or not the manual fire alarm requirements are to be applied when a manual fire alarm is required or whether the placement in the code indicates that manual devices are required regardless. This is also part of an attempt to differentiate the code requirements between initiating devices and notification devices.

907.5.1 This is a new section that is added to address the smoke detector that is required in NFPA 72. The NFPA 72 Fundamental Technical Committee feels this requirement is more appropriate in the building and fire codes rather than NFPA 72. NFPA 72 provides the “how to” for fire alarm devices required by building and fire codes. Building and fire codes provide the “when required”. This smoke detector is required to ensure the fire alarm system is capable of performing its function in the event of a fire in the vicinity of the fire alarm control unit. This smoke detector will activate the fire alarm control and allow it to either notify occupants or transmit a signal to a remote monitoring location before the fire impairs the fire alarm control unit. This requirement will be removed from NFPA 72 once it is in the building and fire codes.

907.5.2 The section is reworded so that it is clear that the intent is to install fire alarm boxes where a manual fire alarm system is required. This clears up the question as to when manual devices are required.

907.5.2.1 Other than the section number, nothing is changed

907.5.2.2 Other than the section number, nothing is changed

907.5.2.3 Other than the section number, nothing is changed

907.5.2.4 Other than the section number, nothing is changed

907.5.2.5 – A reference is added to the allowed projections in the IBC. Without this reference, it would be possible for a review by the fire code official to allow a protective cover that would project in a manner not allowed by the IBC.

907.5.3 The basic language is located currently in Section 907.2. However, it is referring to detection devices and should be located in this part of Section 907. The first sentence is rephrased. Smoke detectors are the limiting installation device. A smoke detection system also includes wiring, power supply, etc. It is not these things but rather the smoke detectors that are of concern. Additionally “shall be permitted” is proper code language – not “shall be allowed.” The word “approved” is inserted here because it is appropriate that there be coordination between the code official and the designer in the selection of the device that will substitute for the smoke detector.

907.6 The existing section 907.7 is given a new title to more clearly indicate the function of the activation. The first sentence is added so that it is clear that activation begins by notifying the panel and then notifying the occupants of an alarm condition.

The existing sentence (now the second sentence) has terminology changed to “fire alarm system” which is defined and used elsewhere in the code. The existing term “alarm notification system” is undefined and therefore not well enforceable. It is assumed that the “alarm notification” was intended to indicate that an alarm condition would be sent to the fire alarm control unit but it is not clear that occupant notification would be included in the assumption. The revised text clarifies the issue.

In three locations “required” is deleted and in one place “provided” inserted. As stated previously, it is assumed that when there is a manual fire alarm box, that it performs the function of every other manual fire alarm box – whether the device is “required” or optionally “provided.” If there are special circumstances wherein the anticipated response to a provided system is other than expected by this section, it will be necessary to address that with coordination between the designer and the code official.

The fourth item in the list is a proposal based on moving the provisions in the existing section 907.14 to this location. It is not intended to increase or decrease any provisions of the code – only combine similar requirements into one location for better ease of use.

There are three new exceptions proposed. A few of these are not all “new” inasmuch as they are identified rather than simply “understood” to be the case.

Exception #1 According to the general understanding and the concepts addressed in NFPA 72, it is not necessary to initiate occupant notification if the device is to close a damper or affect the function of a door. The reference to Section 907.4 is to the proposed 907.4 dealing with specific fire safety functions.

Exception #2 This exception is a recognition that there are places in the code where one alternative to occupant notification is an alarm notification at a constantly attended location. The exception is intended to clarify the code so that there is no question as to whether this general provision for alarm activation is superseded by the other sections addressing the alarm notification at a constantly attended location. There is no new exception offered here, only recognition of and coordination with those already in the code.

Exception #3 This is a new exception that attempts to address a confusing section in Section 903.4.2. The addition of the one audible alarm notification appliance is intended to provide feedback to the individual operating the manual fire alarm box so they know that something is happening. It is not intended to provide full occupant notification. There are numerous differences in interpretation of what must occur if this manual fire alarm box is actuated. A similar exception has been submitted for Section 903.4.2. Many interpret 903.4.2 to require alarm notification appliances to be installed throughout a facility due to the wording in this section that states “Where a fire alarm system is installed, actuation of the automatic sprinkler system shall actuate the building fire alarm system.” NFPA has added a new definition in the 2007 edition to describe this system as a “Dedicated Function Fire Alarm System”, with the intent to show that it is not the building fire alarm system, and was only installed to provide monitoring of the required sprinkler system. Since Section 903 does not require occupant notification inside the building, full occupant notification should not be required. Visible alarm notification appliances were intentionally omitted to avoid any conflict with ADAAG requirements.

907.6.1 The ability to “presignal” is a feature of a fire alarm system and not a separate system as described within NFPA 72. Thus the title and language with the section are changed to recognize that fact. And use language common to the industry. The phrase “24-hour personnel supervision” is deleted since that is language that describes a proprietary supervisory service. Instead, the phrase “at a constantly attended location” is used, consistent with its usage in other sections of the code where a presignal feature is allowed. The text noting that occupant notification can be activated in the event of a fire is consistent with description of a presignal feature in NFPA 72.

907.6.2 The text is relocated from 907.10. There are no changes to the text.

907.6.2.1 The requirements of Section 907.10.2 are moved up. There sections address the audible devices. Because the code addresses audible and visual devices in that order, the sections are changed to reflect the order. There are no changes to the first sentence. The remainder of the large existing paragraph is divided for ease of reference and to make it clear what the exception applies to.

907.6.2.1.1 The second sentence in the existing 907.10.2 is given its own title and section. These represent the general sound pressure requirements for audibility. A technical change is made to the minimum sound pressure level for sleeping rooms. Based on the current text in NFPA 72, the pressure level is proposed to be increased from 70 dBA to 75 dBA. Otherwise the sentence is unchanged. The higher level is deemed necessary in order to wake people from a deep sleep.

907.6.2.1.2 The third sentence in the existing paragraph addresses special conditions relative to the maximum recommended sound pressure levels. Also based on recommendations from NFPA 72, the maximum sound pressure level is proposed to be lowered from 120 dBA to 110 dBA. The reduction is based on the fact that 120 dBA is just under the threshold of pain. If a person were close to such a device when it activated the result could be permanent hearing loss. The lower threshold is considered to still be loud enough for people to hear consistent with device spacing requirements in NFPA 72 for such spaces.

907.6.2.2 The voice alarm system is a type of notification device. It is an audible one but one which can produce intelligible words and provide direction to occupants in case of an emergency. Although it is most often associated with high-rise buildings, it is also used in large assembly spaces. Therefore, it is more appropriate that it be located in a part of section 907 that is not specifically associated with one type of building. The existing location is considered “buried” in the text and not easily found. The proposed relocation to a section with other notification devices makes the requirement more user-friendly. It should be located close to the requirements for other devices using sound. There are no proposed changes to the text.

907.6.2.2.1 This is text moved from the subordinate section to 907.2.12. There is no proposed change to the text – only renumbering to be consistent with the relocation of 907.2.12.

907.6.2.2.2 This is text moved from the subordinate section to 907.2.12. There is no proposed change to the text – only renumbering to be consistent with the relocation of 907.2.12.

907.6.2.2.3 In the subsection for large assembly voice alarms, is the requirement for emergency power for the voice alarm system. This is assumed to be true also for high-rise but is noted in the high-rise section of the IBC (403.11.1, item 3). Thus it makes sense that the provision be inserted here so that it is clear that emergency power is required.

907.6.2.3 The provision in Section 907.10.1 are relocated without change to the text or to the exceptions other than to refer to new section numbers, revised as a result of text relocation.

907.6.2.3.1 Text is relocated. There is no change to the text except for renumbering.

907.6.2.3.2 The word “initially” is added to make it clear that the intent is to initially provide for the expansion in circuitry when the system is designed. This is so that at some time in the future additional devices may be added. It is not the intent that the 20% spare capacity be increased each time that the system is modified. The reason for the additional capacity is so that visual devices can be added should hearing disabled employees be hired and renovations be required to add strobes. The 20% spare capacity is intended to be used – not continued at that time.

907.6.2.3.3 The word “dwelling unit” is added. As discussed in prior sections, if there are provisions for cooking in the I-1 or R-1 unit, it then is defined as a dwelling unit. Consequently the term must be added in order to address those conditions. The reference to the table will change as a result of the change in location and renumbering of the base code section. There are no other changes to the code section.

Table 907.6.2.3.3 The table is changed both in the title and in the second column heading. Because the table only deals with visual devices, the reference to audible devices is extraneous. Therefore, it is deleted from the table. Quantities in the table and threshold numbers are unchanged.

907.6.2.3.4 The text is proposed to be modified to be consistent with that in new section 907.3.2.3.2. The existing text only makes reference to spare capacity but does not address what the spare capacity must be. Because the reason for the spare capacity in Group R-2 is the same as that for employee areas, the language was made to be the same.

907.7 A new scoping section is added that identifies the following provisions those associated with installation and not as being somehow another requirement for additional devices. The statement is made that installation shall comply with NFPA 72. This allows similar statements all other the section to be removed as redundant.

907.7.1 The text was moved from 907.6, unchanged. Wiring is placed in the section before power supply because wiring must be installed before the power supply. Thus it is a simple order shift to a logical format.

907.7.2 The text was relocated from 907.5. Although the basic section is unchanged, a new exception is proposed to recognize the fact that battery back-up is provided for smoke alarms as the secondary power supply.

907.7.3 A portion of the installation is to establish alarm notification zones. The text is taken from the existing section 907.9 without changes.

907.7.3.1 The provisions for the zoning indicator panel are relocated here without changes; again as a subsection to zoning.

907.7.3.2 Because special notification zoning is included in the code for high-rise buildings, the provisions are inserted here, after zoning.

There are no changes to the text.

907.7.4 Access to devices is an installation consideration and so it is relocated here. Otherwise the text is unchanged.

907.7.5 –The requirement for monitoring the fire alarm is relocated here from 907.15. The terminology is changed from “supervisory service” to monitoring by a “supervising station” to reflect the current usage in NFPA 72 and within the industry.

907.7.5.1 Telephone dialing devices are located in a section subordinate to that for monitoring and so are moved her, without changes.

907.8 Section 907.17 is proposed to be renumbered and function as the scoping section for acceptance testing of fire alarm systems. The total is changed to reflect the fact that testing is a portion of what it means to complete the installation. The “grocery list” of components is deleted and the sentence revised to include the fire alarm system “and all fire alarm components.” Because the acceptance testing is to be in accordance with NFPA 72, those components that have testing procedures will be included as part of the fire alarm system

907.8.1 Specific acceptance testing is noted in the existing code for smoke alarms in new buildings. There is no similar provision in the code for existing buildings although it would make sense that the same testing be applied to those devices as well. By taking those provisions and relocating them here, it is clear that all smoke alarms are to be tested as applicable to smoke alarms.

907.8.2 The record of completion should mean that the system has not only been installed but that it is tested. It is important to note testing here rather than allow the reference to NFPA 72 alone. If the system requires a special testing procedure due to special circumstances, then those testing procedures will be a part of the approved plans and/or specifications. Until it is tested, the installation is not complete. Otherwise the text from existing section 907.18 is unchanged.

907.8.3 The section about instructions is unchanged except for the renumbering.

907.9 –The section is renumbered as part of the reformatting. The reference to Chapter 10 in NFPA 72 is deleted. The code makes it clear enough that the requirements for inspection, testing and maintenance must be in accordance with NFPA 72. The provisions for that are no longer in Chapter 10. By deleting the chapter reference the code will always be consistent with the proper reference.

907.9.1 The grocery list is proposed for deletion. It adds nothing and could possibly be construed as all inclusive. The resultant text simply states that “whenever required. . .” That should address the concern.

907.9.2 As noted for section 907.9, there is no reason to make reference to a specific chapter in NFPA 72 since the document already identifies what needs to be done for testing. And, because testing intervals are also addressed in NFPA 72, there is no reason for the second sentence which could conflict with the reference standard if NFPA 72 changes. The exception is maintained because it specifically involves an action required by the fire code official.

907.9.3 The word “smoke” is added too clarify that the sensitivity testing is only applicable to smoke detectors and should not be applied to other types of detectors. It can be understood by reading the text but it is much clearer to simply state smoke detector rather than leave it ambiguous.

907.9.4 The section is renumbered. In Exception #2 the words “and multiple-station” are added so that it is clear that the exception applies whether there is a single smoke alarm or whether there are more that are interconnected.

907.9.4.1 Again, the word “smoke” is added to make it clear that the testing is for smoke detectors and not other devices.

907.9.5 The language is changed to be clearer that the building owner bears the responsibility for maintaining the fire and life safety systems. Use of the word “ensure” does nothing to assist in the enforcement of the code. It only provides a mechanism by which the owner can argue that someone else is responsible for a particular action. While various responsibilities may be a reality, the code should not make the distinction. It is the owner’s responsibility; plain and simple.

PART II – IBC

In the Part II - IBC portion of this code change, the insertion of the new IBC Section 907.3 will give a reference to the reader for new work that is in conjunction with an existing building. It also serves to align the numbering between the IFC and the IBC. None of the other subsections of 907.3 in the fire code will be included in the building code.

Primarily, the effort in this code change is in reorganization. A little was in proper use of terminology. Still a little more was in addressing changes in the NFPA 72 standard. Basically, the effort is to produce a part of the code that is similar in organization to other sections and that provides a framework where future proposals can be made without adding section after section to the end of 907.

SECTION 907 ADDITIONAL INFORMATION

Summary of differences: There are two rather large code change proposals that are submitted together along with several smaller ones. One of the large ones is based on a comprehensive change to Section 907 in formatting and clarifications as well as several technical changes. The other proposal is intended only to address the reformatting and several clarification items. Several additional code change proposals have been submitted separately to address those technical items. If the comprehensive proposal is preferred there is no need to separately address those other technical proposals. This is the comprehensive proposal that includes those technical changes. The list below is a brief description of the differences between the two:

907.1.1 – Added item #12; classification of supervising station;

907.2 – Added requirement for manual alarm box at fire alarm control unit, consistent with NFPA 72 requirements;

907.2.10.4 – Added back-up power for strobes in smoke alarms (new construction)

907.3.4.3 – Added back-up power for strobes in smoke alarms (existing construction)

907.5.1 – Added smoke detector at fire alarm control unit consistent with NFPA 72

907.6.2.1.1 & 907.6.2.1.2 – Changed sound pressure levels based on recommendations for the upcoming NFPA 72

Section matrix and general listing of renumbered sections. This matrix is provided as an assist in reviewing the renumbering of individual sections and to understand where certain segments of text may have been moved.

CODE CHANGES RESOURCE COLLECTION – INTERNATIONAL BUILDING CODE

New Section	Was
907.1	907.1
907.1.1	907.1.1
907.1.2	907.1.2
907.2.	907.2
907.2.1	907.2.1
907.2.1.1	907.2.1.1
907.2.2	907.2.2
907.2.3	907.2.3
907.2.4	907.2.4
907.2.5	907.2.5
907.2.6	907.2.6
907.2.6.1	907.2.6.1
907.2.6.1.1	New
907.2.6.2	907.2.6.2
907.2.6.3	907.2.6.3
907.2.6.3.1	907.2.6.3.1
907.2.6.3.2	907.2.6.3.2
907.2.6.3.3	907.2.6.3.3
907.2.7	907.2.7
907.2.7.1	907.2.7.1
907.2.8	907.2.8
907.2.8.1	907.2.8.1
907.2.8.2	907.2.8.2
907.2.8.3	907.2.8.3
907.2.9	907.2.9
907.2.9.1	New
907.9.2	New
907.2.10	907.2.10
907.2.10.1	907.2.10.1.1
907.2.10.2	907.2.10.1.2
	907.2.10.1.3
907.2.10.3	907.2.10.3
907.2.10.4	907.2.10.2
907.2.11	907.2.11
907.2.11.1	907.2.11.1
907.2.11.2	907.2.11.2
907.2.11.3	907.2.11.3
907.2.12	907.2.12
907.2.12.1	907.2.12.1
907.2.12.2	907.2.12.3
907.2.13	907.2.13
907.2.14	907.2.14
907.2.15	907.2.16
907.2.16	907.2.17
907.2.17	907.2.18
907.2.17.1	907.2.18.1
907.2.17.2	907.2.18.2
907.2.17.3	907.2.19
907.2.17.3.1	907.2.19.1
907.2.18	907.2.20
907.2.19	907.2.21
907.2.20	907.2.22
907.2.21	907.2.23
907.3	907.3
907.3.1	907.3.1.1
907.3.2	New
907.3.2.1	907.3.1.2
907.3.2.2	907.3.1.3
907.3.2.3	907.3.1.4
907.3.3	New
907.3.3.1	907.3.1.5
907.3.3.2	907.3.1.6
907.3.3.3	907.3.1.7
907.3.3.4	907.3.1.8
907.3.4	907.3.2
907.3.4.1	907.3.2.1
907.3.4.2	907.3.2.2
907.3.4.3	907.3.2.3
907.4	907.11
907.4.1	907.12
907.4.2	907.2.15

New Section	Was
907.4.3	New
907.4.4	907.2.11.2 (part)
907.5	New
907.5.1	New
907.5.2	907.4
907.5.2.1	907.4.1
907.5.2.2	907.4.2
907.5.2.3	907.4.3
907.5.2.4	907.4.4
907.5.2.5	907.4.5
907.5.3	907.2 (part)
907.6 , #4	907.7, 907.14
907.6.1	907.8
907.6.2	907.10
907.6.2.1	907.10.2
907.6.2.1.1	907.10.2
907.6.2.1.2	907.10.2
907.6.2.2	907.2.12.2 907.2.12.2.3
907.6.2.2.1	907.2.12.2.1
907.6.2.2.2	907.2.12.2.2
907.6.2.2.3	907.2.1.2
907.6.2.3	907.10.1
907.6.2.3.1	907.10.1.1
907.6.2.3.2	907.10.1.2
907.6.2.3.3	907.10.1.3
907.6.2.3.4	907.10.1.4
907.7	New
907.7.1	907.6
907.7.2	907.5
907.7.3	907.9
907.7.3.1	907.9.1
907.7.3.2	907.9.2
907.7.4	907.13
907.7.5	907.15
907.7.5.1	907.16
907.8	907.17
907.8.1	907.2.10.4
907.8.2	907.18
907.8.3	907.19
907.9	907.20
907.9.1	907.20.1
907.9.2	907.20.2
907.9.3	907.20.3
907.9.4	907.20.4
907.9.4.1	907.20.4.1
907.9.5	907.20.5

Bibliography:

NFPA 72 – National Fire Alarm Code; 2002 edition.
NFPA 72 – National Fire Alarm Code; 2007 edition – draft text
NFPA 72 – National Fire Alarm handbook; 2002 edition
NFPA 101 – Life Safety Code; 2006 edition
SFPE Handbook; 2nd edition, 1995

Cost Impact: There is little to no cost impact to this proposal, depending on the Occupancy Group classification and size of building. A few of the items may increase the cost of construction (i.e. battery backup for smoke alarms) but the added clarification should reduce the cost of construction.

Public Hearing Results

PART I C IFC**Committee Action:****Approved as Modified****Modify the proposal as follows:**

907.1 General. This section covers the application, installation, performance and maintenance of fire alarm systems and their components in new and existing buildings and structures. The requirements of Section 907.2 are applicable to new buildings and structures. The requirements of Section 907.3 are applicable to existing buildings and structures, as follows:

1. The requirements of Section 907.2 are applicable to new buildings and structures.
2. The requirements of Section 907.3 are applicable to existing buildings and structures.

907.1.1 Construction documents, ~~Shop drawings.~~ Construction documents ~~Shop drawings~~ for fire alarm systems shall be submitted for review and approval prior to system installation. ~~Construction documents shop drawings~~ shall include, but not be limited to, all of the following:

1. A floor plan which indicates the use of all rooms.
2. Locations of alarm-initiating and notification appliances.
3. Location of fire alarm control unit, transponders, and notification power supplies.
4. Annunciators.
5. Power connection.
6. Battery calculations.
7. Conductor type and sizes.
8. Voltage drop calculations.
9. Manufacturer data sheets indicating model numbers and listing information for equipment, devices and materials.
10. Details of ceiling height and construction.
11. The interface of fire safety control functions.
12. Classification of the supervising station.

907.2.8.1 Manual fire alarm system. A manual fire alarm system that activates the occupant notification system in accordance with Section 907.6 shall be installed in Group R-1 occupancies.

Exceptions:

1. A manual fire alarm system is not required in buildings not more than two stories in height where all individual ~~dwelling units or~~ sleeping units and contiguous attic and crawl spaces to those units are separated from each other and public or common areas by at least 1-hour fire partitions and each individual ~~dwelling unit or~~ sleeping unit has an exit directly to a public way, exit court or yard.
2. Manual fire alarm boxes are not required throughout the building when the following conditions are met:
 - 2.1. The building is equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2.
 - 2.2. The notification appliances will activate upon sprinkler water flow; and
 - 2.3. At least one manual fire alarm box is installed at an approved location.

907.2.8.2 Automatic fire alarm system. An automatic fire alarm system that activates the occupant notification system in accordance with Section 907.6 shall be installed throughout all interior corridors serving ~~dwelling units or~~ sleeping units.

Exception: An automatic fire detection system is not required in buildings that do not have interior corridors serving ~~dwelling units or~~ sleeping units and where each ~~dwelling unit or~~ sleeping unit has a means of egress door opening directly to an exit or to an exterior exit access that leads directly to an exit.

907.2.10.1 Group R-1. Single- or multiple-station smoke alarms shall be installed in all of the following locations in Group R-1:

1. In sleeping areas.
2. In every room in the path of the means of egress from the sleeping area to the door leading from the ~~dwelling unit or~~ sleeping unit.
3. In each story within the ~~dwelling unit or~~ sleeping unit, including basements. For ~~dwelling units or~~ sleeping units with split levels and without an intervening door between the adjacent levels, a smoke alarm installed on the upper level shall suffice for the adjacent lower level provided that the lower level is less than one full story below the upper level.

~~907.2.17.3~~ **907.2.18 Deep underground buildings.** (Proposed text is unchanged)

~~907.2.17.3.4~~ **907.2.18.1 Public address system.** (Proposed text is unchanged)

~~907.2.18~~ **907.2.19 Covered mall buildings.** (Proposed text is unchanged)

~~907.2.19~~ **907.2.20 Residential aircraft hangars.** (Proposed text is unchanged)

~~907.2.20~~ **907.2.21 Airport traffic control towers.** (Proposed text is unchanged)

~~907.2.21~~ **907.2.22 Battery rooms.** (Proposed text is unchanged)

907.3 Where required retroactive in existing buildings and structures. An approved manual, automatic or manual and automatic fire alarm system shall be installed in existing buildings and structures in accordance with Sections 907.3.1 through 907.3.1.8 and provide occupant notification in accordance with Section 907.6 unless other requirements are provided by other sections of this code.

Exception: Occupancies with an existing, previously approved fire alarm system.

907.3.3.1 Group R-1 hotels and motels. An automatic or manual fire alarm system that activates the occupant notification system in accordance with Section 907.6 shall be installed in existing Group R-1 hotels and motels more than three stories or with more than 20 ~~dwelling units or~~ sleeping units.

Exception: Buildings less than two stories in height where all ~~dwelling units or~~ sleeping units, attics and crawl spaces are separated by 1-hour fire-resistance-rated construction and each ~~dwelling unit or~~ sleeping unit has direct access to a public way, exit court or yard.

907.4 Fire safety functions. Automatic fire detectors utilized for the purpose of performing fire safety functions shall be connected to the building's fire alarm control unit where a fire alarm system is required by Section 907.2 provided. Detectors shall, upon actuation, perform the intended function and activate the alarm notification appliances or activate a visible and audible supervisory signal at a constantly attended location. In buildings not equipped with a fire alarm system, the automatic fire detector shall be powered by normal electrical service and, upon actuation, perform the intended function. The detectors shall be located in accordance with NFPA 72.

907.4.1 Duct smoke detectors. Duct smoke detectors shall be connected to the building's fire alarm control unit when a fire alarm system is required by Section 907.2 provided. Activation of a duct smoke detector shall initiate a visible and audible supervisory signal at a constantly attended location. Duct smoke detectors shall not be used as a substitute for required open area detection.

Exceptions:

1. The supervisory signal at a constantly attended location is not required where duct smoke detectors activate the building's alarm notification appliances.
2. In occupancies not required to be equipped with a fire alarm system, actuation of a smoke detector shall activate a visible and an audible signal in an approved location. Smoke detector trouble conditions shall activate a visible or audible signal in an approved location and shall be identified as air duct detector trouble.

907.6 Alarm notification systems. A fire alarm system shall annunciate at the panel and shall initiate occupant notification upon activation, in accordance with this section. Where a fire alarm system is required by another section of this code ~~provided~~, it shall be activated by:

1. Automatic fire detectors.
2. Sprinkler water-flow devices.
3. Manual fire alarm boxes.
4. Automatic fire-extinguishing systems.

Exceptions:

1. Occupant notification is not required for fire detectors used to control fire safety functions in accordance with Section 907.4.
2. Where notification systems are permitted elsewhere in this section to annunciate at a constantly attended location.
- ~~3. Where a dedicated function fire alarm system is installed exclusively to transmit waterflow signals to a remote monitoring location, a single audible alarm notification device, in accordance with Section 903.4.2, shall be installed in the vicinity of the manual fire alarm box to activate upon detection of waterflow or upon activation of the manual fire alarm box.~~

907.6.2.3.4 Group R-2. In Group R-2 occupancies required by Section 907 to have a fire alarm system, ~~the notification appliance circuits serving~~ all dwelling units and sleeping units shall be ~~initially designed with a minimum of 20% spare~~ provided with the capability to support visible alarm notification appliances in accordance with ICC A117.1.

(Portions of proposal not shown remain unchanged)

Committee Reason: Based on the proponent's reason statement. The proposal achieves the proponent's stated goals and is a substantial improvement over the current Section 907. The committee felt that the proposal as modified is a good starting point for future improvements. The modifications, which deal with concerns brought up in testimony and committee discussion, delete redundant text (907.1), retain use of a defined term (907.1.1), correct an error in including the term Adwelling units® in Group R-1 requirements (907.2.8.1, 907.2.8.2, 907.2.10.1, 907.3.3.1), clarify applicability to all deep underground buildings (907.2.18), retain a reasonable exception (907.3), retain applicability only to required systems (907.4, 907.4.1), clarify applicability only with a required alarm system (907.6), correlate with the action on F100-06/07 (907.6, Ex. 3), and recognize that the requirement can be met by simple installation of a relay in the unit (907.6.2.3).

Assembly Action:

None

PART II C IBC FIRE SAFETY**Committee Action:**

Approved as Submitted

Committee Reason: This proposal brings the reference into both the IBC and also the IEBC. This will provide a helpful reference where new work is being done within an existing building. An additional benefit will be that it will help coordinate the numbering between Chapter 9 of the IBC and IFC and help eliminate confusion that sometimes occurs because of the difference in the numbering.

Assembly Action:

None

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because public comments were submitted for Part I.

Public Comment 2:

Gene Boecker, Code Consultants, Inc., requests Approval as Modified by this public comment for Part I.

Modify only Section 907.5.1 of Part I of the proposal as follows:

907.5.1 Protection of Fire Alarm Control Unit. In areas that are not continuously occupied, a single smoke detector shall be provided at the location of each fire alarm control unit, notification appliance circuit power extenders, and supervising station transmitting equipment.

Editorially, revise the exception to be identified as Exception Number 1 and add the following second exception:

2. The smoke detector shall not required where the building is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2.

Commenter's Reason: During the preparation of the code change, efforts were made to include items that were anticipated as a part of the revised NFPA 72 standard. The deadline for proposal submittal was prior to the final action of the NFPA 72 committee. During public testimony at the ICC hearings in Orlando, it was noted that one of the differences was that the NFPA 72 committee adopted language that allowed for the omission of the smoke detector if the building was sprinklered.

This modification would modify the code language and insert into the code the exception, making the IBC and IFC consistent with the fire alarm requirements in NFPA 72. This concept was discussed by the task group working on the original code change proposal. We have subsequently discussed this with the individual who raised the issue at the ICC committee hearings and resolved the issue with the original task group. This proposed modification is the result.

We believe, consistent with the NFPA 72 committee, that the need for the smoke detector is diminished if not totally eliminated by the presence of the sprinkler system throughout the building. The intent of the smoke detector was to provide an early warning device should a fire originate in the area of the fire alarm control unit. The sprinkler system, with its integral connection to the fire alarm control unit, accomplishes that purpose. This issue has been discussed at numerous code hearings in the past. A vote in favor of this modification would be consistent with the prior actions.

Public Comment 3:

Gene Boecker, Code Consultants, Inc., requests Approval as Modified by this public comment for Part I.

Modify Part I of proposal as follows:

907.2.1 Group A. A manual fire alarm system that activates the occupant notification system in accordance with Section 907.6 shall be installed in Group A occupancies having an occupant load of 300 or more. Portions of Group E occupancies occupied for assembly purposes shall be provided with a fire alarm system as required for the Group E occupancy.

Exception: Manual fire alarm boxes are not required where the building is equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 and the occupant notification appliances will activate throughout the notification zones upon sprinkler water flow.

907.2.2 Group B. A manual fire alarm system that activates the occupant notification system in accordance with Section 907.6 shall be installed in Group B occupancies where one of the following conditions exists:

1. (No change to current text)
2. (No change to current text)

Exception: Manual fire alarm boxes are not required where the building is equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 and the occupant notification appliances will activate throughout the notification zones upon sprinkler water flow.

907.2.3 Group E. A manual fire alarm system that activates the occupant notification system in accordance with Section 907.6 shall be installed in Group E occupancies. When automatic sprinkler systems or smoke detectors are installed, such systems or detectors shall be connected to the building fire alarm system.

Exceptions:

1. (No change to current text)
2. (No change to current text)
3. Manual fire alarm boxes shall not be required in Group E occupancies where the building is equipped throughout with an approved automatic sprinkler system installed in accordance with Section 903.3.1.1, the notification appliances will activate on sprinkler water flow and manual activation is provided from a normally occupied location.

907.2.4 Group F. A manual fire alarm system that activates the occupant notification system in accordance with Section 907.6 shall be installed in Group F occupancies where both of the following conditions exist:

1. (No change to current text)
2. (No change to current text)

Exception: Manual fire alarm boxes are not required where the building is equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 and the occupant notification appliances will activate throughout the notification zones upon sprinkler water flow.

907.2.6.1 Group I-1. An automatic smoke detection system shall be installed in corridors, waiting areas open to corridors and habitable spaces other than sleeping rooms and kitchens. The system shall be activated in accordance with Section 907.6.

Exceptions:

1. Smoke detection in habitable spaces is not required where the facility is equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1.
2. (No change to current text)

907.2.6.3.3 Smoke detectors. An automatic smoke detection system shall be installed throughout resident housing areas, including sleeping areas and contiguous day rooms, group activity spaces and other common spaces normally accessible to residents.

Exceptions:

1. (No change to current text)
2. (No change to current text)
3. Smoke detectors are not required in sleeping units with four or fewer occupants in smoke compartments that are equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1.

907.2.7 Group M. A manual fire alarm system that activates the occupant notification system in accordance with Section 907.6 shall be installed in Group M occupancies where one of the following conditions exists:

1. The combined Group M occupant load of all floors is 500 or more persons.
2. The Group M occupant load is more than 100 persons above or below the lowest level of exit discharge.

Exceptions:

1. (No change to current text)
2. Manual fire alarm boxes are not required where the building is equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 and the occupant notification appliances will automatically activate throughout the notification zones upon sprinkler water flow.

907.2.9.1 Manual fire alarm system. A manual fire alarm system that activates the occupant notification system in accordance with Section 907.6 shall be installed in Group R-2 occupancies where:

1. Any dwelling unit or sleeping unit is located three or more stories above the lowest level of exit discharge;
2. Any dwelling unit or sleeping unit is located more than one story below the highest level of exit discharge of exits serving the dwelling unit or sleeping unit; or
3. The building contains more than 16 dwelling units or sleeping units.

Exceptions:

1. Manual fire alarm boxes are not required where the building is equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2 and the occupant notification appliances will automatically activate throughout the notification zones upon a sprinkler water flow.
2. (No change to current text)

(Portions of proposal not shown remain unchanged)

Commenter's Reason: One of the efforts of the task group was to revise language for consistency with that used elsewhere in the code. During the rewrite it was determined that the *"equipped throughout with an automatic sprinkler system"* phrase should be used where applicable since it is used in other places in Chapter 9 and 10.

Inadvertently, the task group overlooked the reference language that is used non-consistently. In order to use language that is consistent and more specific, the reference language should be added to avoid confusion regarding whether one or both types of dominant sprinkler designs are acceptable. Elsewhere in the code reference is made to the applicable section for installation. This amendment would continue that application.

Final Hearing Results

F122-06/07, Part I AMPC2, 3
F122-06/07, Part II D

Code Change No: F123-06/07

Original Proposal

Sections: 909.8.1 (IBC [F] 909.8.1)

Proponent: Daniel E. Nichols, New York State Department of State

Revise as follows:

909.8.1 Smoke layer. The height of the lowest horizontal surface of the ~~accumulating~~ smoke layer interface shall be maintained at least 6 feet (1829 mm) above any walking surface that forms a portion of a required egress system within the smoke zone.

Reason: The purpose of this code change proposal is to remove a potential conflict between the IFC (IBC, IMC) and the design standard, NFPA 92B

NFPA 92B has a definition for the term 'smoke layer interface'. Due to the dynamics of a fire event, smoke does not accumulate at a constant rate from the ceiling of a space. NFPA 92B addresses this by discussing the smoke layer as the hazard it produces rather than the current IFC language that is often interpreted as a clear space. Retaining the term 'accumulating smoke layer' could become confusing when using NFPA 92B since it could be interpreted that the code is referencing the NFPA 92B definition of 'transition zone' or 'first indication of smoke' rather than the 'smoke layer interface.'

Bibliography: NFPA 92B, 2005 edition- Smoke Management Systems

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: Based on the proponent-s reason statement. The proposal provides correlation with the terminology used in the referenced standard, NFPA 92B.

Assembly Action:

None

Final Hearing Results

F123-06/07

AS

Code Change No: F132-06/07

Original Proposal

Sections: 912.2 (IBC [F] 912.2)

Proponent: Greg Rogers, South Kitsap Fire & Rescue, representing ICC Joint Fire Service Review Committee

Revise as follows:

912.2 Location. With respect to hydrants, driveways, buildings and landscaping, fire department connections shall be so located that fire apparatus and hose connected to supply the system will not obstruct access to the buildings for other fire apparatus. The location of fire department connections shall be approved by the fire code official.

Reason: The proposal will correlate this section with the approval language in Sections 912.2.1 and 912.2.2.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Modified

Modify the proposal as follows:

912.2 Location. With respect to hydrants, driveways, buildings and landscaping, fire department connections shall be so located that fire apparatus and hose connected to supply the system will not obstruct access to the buildings for other fire apparatus. The location of fire department connections shall be approved by the fire ~~code official~~.

Committee Reason: The proposal will provide the desired correlation with Sections 912.2.1 and 912.2.2. The modification reflects the fact that FDC location is a matter of operational concern for the fire department.

Assembly Action:

None

Final Hearing Results

F132-06/07

AM

Code Change No: **F133-06/07**

Original Proposal

Sections: 912.3, 912.3.2 (New), 912.3.3 (New) [IBC [F] 912.3, [F] 912.3.2 (New), [F] 912.3.3 (New)], IFC 508.5.4

Proponent: Greg Rogers, South Kitsap Fire & Rescue, representing ICC Joint Fire Service Review Committee

1. Revise as follows:

912.3 Access. Immediate access to fire department connections shall be maintained at all times and without obstruction by fences, bushes, trees, walls or any other fixed or moveable object ~~for a minimum of 3 feet (914 mm)~~. Access to fire department connections shall be approved by the fire code official.

Exception: Fences, where provided with an access gate equipped with a sign complying with the legend requirements of Section 912.4 and a means of emergency operation. The gate and the means of emergency operation shall be approved by the fire code official and maintained operational at all times.

2. Add new text as follows:

912.3.2 Clear space around connections. A working space of not less than 36 inches (762 mm) in width, 36 inches (914 mm) in depth and 78 inches (1981 mm) in height shall be provided and maintained in front of and to the sides of wall-mounted fire department connections and around the circumference of free-standing fire department connections, except as otherwise required or approved by the fire code official.

912.3.3 Physical protection. Where fire department connections are subject to impact by a motor vehicle, vehicle impact protection shall be provided in accordance with Section 312.

3. Revise as follows:

508.5.4 Obstruction. Unobstructed access to fire hydrants shall be maintained at all times. Posts, fences, vehicles, growth, trash, storage and other materials or objects shall not be placed or kept near fire hydrants, fire department inlet connections or fire protection system control valves in a manner that would prevent such equipment or fire hydrants from being immediately discernible. The fire department shall not be deterred or hindered from gaining immediate access to fire protection equipment or fire hydrants.

Reason: The phrase "...for a minimum of 3 feet..." was added by code changes F830-98 and F831-98 as a means of correlating with IFC Section 508.5.5 - Clear space around hydrants. The added phrase, however, can be and has been literally interpreted as allowing obstructions to fire department connection (FDC) access to exist as long as they are kept 3 feet away from the FDC.

The suggested solution clarifies the intent of the section by deleting the conflicting text from Section 912.3 and adding recognition that the obstructing objects regulated here can be either fixed or moveable (such as outdoor furnishings, shopping cart queue areas, etc.). A new sentence is also suggested that reinforces the approval process by the fire code official.

The suggested solution also includes an exception that recognizes the practical fact that sometimes, security or other considerations make installation of a fence around a building necessary as long as the fence meets the stated criteria. The sign requirement intends to provide a visual location cue to approaching fire apparatus where the height of the fence may obscure the visibility of the FDC. The text of the exception is based on IFC Section 503.6.

The suggested solution, in new Sections 912.3.2 and 912.3.3, includes text that is more reflective of the intent of the deleted phrase from Section 912.3 (and the intent of Section 508.5.5) and provides added protection consistent with Sections 508.5.6 and 312.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Modified

Modify the proposal as follows:

912.3 Access. Immediate access to fire department connections shall be maintained at all times and without obstruction by fences, bushes, trees, walls or any other fixed or moveable object. Access to fire department connections shall be approved by the fire chief code official.

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Exception: Fences, where provided with an access gate equipped with a sign complying with the legend requirements of Section 912.4 and a means of emergency operation. The gate and the means of emergency operation shall be approved by the fire ~~chief~~ ~~code official~~ and maintained operational at all times.

912.3.2 Clear space around connections. A working space of not less than 36 inches (762 mm) in width, 36 inches (914 mm) in depth and 78 inches (1981 mm) in height shall be provided and maintained in front of and to the sides of wall-mounted fire department connections and around the circumference of free-standing fire department connections, except as otherwise required or approved by the fire ~~chief~~ ~~code official~~.

(Portions of proposal not shown remain unchanged.)

Committee Reason: The proposal clarifies the intent of the code with respect to maintaining FDC's accessible and unobstructed at all times. The modifications reflect the fact that access to FDC's is a matter of operational concern for the fire department.

Assembly Action:

None

Final Hearing Results

F133-06/07

AM

Code Change No: F141-06/07

Original Proposal

Section: 1413.1 (IBC [F] 3311.1)

Proponent: John Berry, Cole + Russell Architects, Inc.

Revise as follows:

1413.1 (IBC [F] 3311.1) Where required. ~~In buildings four or more stories in height shall be provided with~~ required to have standpipes by Section 905.3.1, not less than one standpipe shall be provided for use during construction. Such standpipes shall be installed when the progress of construction is not more than 40 feet (12 192 mm) in height above the lowest level of fire department vehicle access. Such standpipe shall be provided with fire department hose connections at accessible locations adjacent to usable stairs. Such standpipes shall be extended as construction progresses to within one floor of the highest point of construction having secured decking or flooring.

Reason: The proposed text ties Sections 1413.1 and 905.3.1 together to clarify that the building first must need a standpipe based on Section 905.3.1. If the building is required to have standpipes, then one of those standpipes must be provided during construction per Section 1413.1. The proposed text does not alter the intent of the code, but rather clarifies it. The addition of the word "vehicle" merely coordinates the language used elsewhere in the code.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: Based on the proponent-s reason statement. The proposal provides needed clarification of the text and improved correlation between Sections 905 and 1413 of the code by deletion of an arbitrary threshold of 4 stories.

Assembly Action:

None

Final Hearing Results

F141-06/07

AS

Code Change No: F147-06/07

Original Proposal

Sections: 1803.13.2 (IBC [F] 415.8.7.2), 3704.2.2.10

Proponent: Pat McLaughlin, McLaughlin & Associates, representing Semiconductor Industry Association

Revise as follows:

1803.13.2 Gas detection system operation. The continuous gas detection system shall be capable of monitoring the room, area or equipment in which the gas is located at or below the ~~permissible exposure limit (PEL) or ceiling limit of the gas for which detection is provided~~ following gas concentrations:

1. Immediately dangerous to life and health (IDLH) values when the monitoring point is with an exhausted enclosure, ventilated enclosure or gas cabinet.
2. Permissible exposure limit (PEL) levels when the monitoring point is an area outside an exhausted enclosure, ventilated enclosure or gas cabinet.
3. For flammable gases, the monitoring detection threshold level shall be vapor concentrations in excess of ~~20~~ 25 percent of the lower flammable limit (LFL) when the monitoring is within or outside an exhausted enclosure, ventilated enclosure or gas cabinet.
4. Monitoring for highly toxic and toxic gases shall also comply with Chapter 37.

3704.2.2.10 Gas detection system. A gas detection system shall be provided to detect the presence of gas in the room, area or equipment in which the gas is located at or below the ~~permissible exposure limit (PEL) or ceiling limit of the gas for which detection is provided.~~ following gas concentrations:

1. Immediately dangerous to life and health (IDLH) values when the monitoring point is with an exhausted enclosure, ventilated enclosure or gas cabinet.
2. Permissible exposure limit (PEL) levels when the monitoring point is an area outside an exhausted enclosure, ventilated enclosure or gas cabinet.
3. The system shall be capable of monitoring the discharge from the treatment system at or below one-half the IDLH limit.

Exception: A gas detection system is not required for toxic gases when the physiological warning threshold level for the gas is at a level below the accepted PEL for the gas.

Reason: The ACGIH has announced that it is considering lowering the arsine TLV from its current value of 50 ppb to 5 ppb. IFC section 3704.2.2.9 requires gas detection to detect a leak at or below the Permissible Exposure Limit (PEL). This exposure limit regulated by OSHA to prevent adverse health effects and is the breathing zone exposure limit for employees over an 8-hr time weighted average. A great percentage of existing gas detection technology would not be capable of detecting at arsine TLV of 5 ppb. SIA is concerned that if these TLV's are promulgated by OSHA as revised PEL's (TLV's have been the past origin of PEL's), that new detection equipment would have to be retrofitted in existing fabs at significant cost and with little real improvement to personnel safety since all HPM gases are located inside exhausted enclosures, ventilated enclosures or gas cabinets which are designed to contain a worst case release. In most cases, gas detection in the semiconductor industry is conducted in an exhausted enclosure, ventilated enclosure or gas cabinet and not in the breathing zone of the employee, and is designed to detect and alert employees of leaks inside exhausted enclosures, ventilated enclosures or gas cabinets and is not intended to estimate potential employee breathing zone exposures. The semiconductor industry addressed this by codifying NFPA 318, Section 10.9 to differentiate gas detection set points in exhausted enclosures (set at the IDLH) with gas detection when the monitoring point is in an area outside an exhausted enclosure, ventilated enclosure or gas cabinet. The purpose of the change will be to harmonize the IFC with NFPA 318, Section 10.9 (see below) guidelines that are much more relevant to the type of monitoring performed in the semiconductor manufacturing (inside exhausted enclosures, ventilated enclosures or gas cabinets). Monitoring in the semiconductor industry is designed to detect and alert employees of leaks inside exhausted enclosures, ventilated enclosures and gas cabinets and is not intended to estimate potential employee breathing zone exposures. Therefore, set points are not required or recommended to be set at occupational exposure limits (e.g. TLVs or PELs). Additionally, the change from 20% LFL to 25% LFL will create consistency with both IMC, Section 510.2 and NFPA 318, Section 10.9.

NFPA 318 Extracts for Gas-Detection

10.9 Gas-Detection Systems.

10.9.1 General. A gas-detection system shall be provided for hazardous chemical gases when the physiological warning properties of the gas are at a higher level than the accepted permissible exposure limit (PEL) for the gas, for flammable gases, and for pyrophoric gases.

10.9.2 Where Required.

10.9.2.1 Fabrication Areas. A gas-detection system shall be provided in fabrication areas at locations in the fabrication area where gas is used or stored.

10.9.2.2 Hazardous Chemical Rooms. A gas-detection system shall be provided in hazardous chemical storage and dispensing rooms when hazardous gas is in use in the room.

10.9.2.3 Gas Cabinets, Exhausted Enclosures, and Gas Rooms.

10.9.2.3.1 A gas-detection system shall be provided in gas cabinets and exhausted enclosures.

10.9.2.3.2 A gas-detection system shall be provided in gas rooms when gases are not located in gas cabinets or exhausted enclosures.

10.9.3 Gas-Detection System Operation.

10.9.3.1 Monitoring. Gas-monitoring equipment, when required by this standard to warn of the presence of leaked gas, shall be capable of detection and alarm initiation at or below the following gas concentrations:

- (1) Immediately dangerous to life or health (IDLH) values when the monitoring point is within an exhausted enclosure
- (2) PEL levels when the monitoring point is in an area outside an exhausted enclosure
- (3) Twenty-five percent of LFL when the monitoring point is within or outside an exhausted enclosure

10.9.3.2 Shutoff of Gas Supply. Gas-monitoring systems shall automatically close the nearest isolation valve upon high level (IDLH, PEL, and LEL) detection alarms:

- (1) At local gas boxes near the tool or in the tool gas jungle
- (2) At valve manifold boxes, shut down individual sticks
- (3) At the gas source
- (4) At the bulk source

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Modified

Modify the proposal as follows:

1803.13.2 Gas detection system operation. The continuous gas detection system shall be capable of monitoring the room, area or equipment in which the gas is located at or below all the following gas concentrations:

- 1. Immediately dangerous to life and health (IDLH) values when the monitoring point is within an exhausted enclosure, ventilated enclosure or gas cabinet.
- 2. Permissible exposure limit (PEL) levels when the monitoring point is in an area outside an exhausted enclosure, ventilated enclosure or gas cabinet.
- 3. For flammable gases, the monitoring detection threshold level shall be vapor concentrations in excess of 25 percent of the lower flammable limit (LFL) when the monitoring is within or outside an exhausted enclosure, ventilated enclosure or gas cabinet.
- 4. Except as noted in this section, ~~M~~onitoring for highly toxic and toxic gases shall also comply with Chapter 37.

3704.2.2.10 Gas detection system. A gas detection system shall be provided to detect the presence of gas ~~in the room, area or equipment in which the gas is located~~ at or below the PEL or ceiling limit of the gas for which detection is provided, following gas concentrations:

- ~~1. Immediately dangerous to life and health (IDLH) values when the monitoring point is with an exhausted enclosure, ventilated enclosure or gas cabinet.~~
- ~~2. Permissible exposure limit (PEL) levels when the monitoring point is an area outside an exhausted enclosure, ventilated enclosure or gas cabinet.~~
- ~~3.~~ The system shall be capable of monitoring the discharge from the treatment system at or below one-half the IDLH limit.

Exception: A gas detection system is not required for toxic gases when the physiological warning threshold level for the gas is at a level below the accepted PEL for the gas.

Committee Reason: The proposal will provide better correlation with the IMC and industry standards. The modification makes the change applicable only to semiconductor facilities by retaining the current text of Section 3704.2.2.10, clarifying that the other provisions of Chapter 37 still apply and clarifying that the intent of the proposal was not to change the monitoring requirements in occupied spaces, which could include exhausted enclosures.

Assembly Action:

None

Final Hearing Results

F147-06/07

AM

Code Change No: F156-06/07

Original Proposal

Sections: 2209.5.1.1(New), Chapter 45; IBC 406.5.2 (New), Chapter 35

Proponent: Thomas Joseph, Chair, Hydrogen Industry Panel on Codes

THIS PROPOSAL IS ON THE AGENDA OF THE IFC AND THE IBC GENERAL CODE DEVELOPMENT COMMITTEES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IFC

1. Add new text as follows:

2209.5.1.1 Vehicle fueling pad. The vehicle fueling pad shall be constructed of a non-coated concrete pavement or shall have a resistivity not exceeding criteria of 1 megohm as measured using the methodology specified in *EN 1081*.

2. Add new standard to Chapter 45 as follows:

European Committee for Standardization (EN)
Central Secretariat
Rue de Stassart 36
B-10 50 Brussels

European Standard EN 1081: 1998 Resilient Floor Coverings – Determination of the Electrical Resistance

PART II – IBC General

406.5.2 Vehicle fueling pad. The vehicle fueling pad shall be constructed of a non-coated concrete pavement or shall have a resistivity not exceeding criteria of 1 megohm as measured using the methodology specified in *EN 1081*.

2. Add new standard to Chapter 35 as follows:

European Committee for Standardization (EN)
Central Secretariat
Rue de Stassart 36
B-10 50 Brussels

European Standard EN 1081: 1998 Resilient Floor Coverings – Determination of the Electrical Resistance

Reason: The current language does not address safety issues associated with electrostatic discharges (ESD).

Fueling surfaces for hydrogen powered vehicles should be at least as protective regarding ESD issues as those fueling surfaces used for petroleum powered vehicles. The 1 megohm criteria is cited from the *American Petroleum Institute (API) 2003 Recommended Practices (RP)*.

Substantiation: Paving material meeting the criteria specified in the language offered as Section 2209.5.1.1 will ensure the dissipation of static charge build up on the vehicle before the driver opens the door to fuel. Material Similar language has been used in Michigan's proposed Hydrogen Storage and Dispensing Rules.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing Results

Note: The following analysis was not in the Code Change Proposal book but was published in the AErrata to the 2006/2007 Proposed Changes to the International Codes and Analysis of Proposed Referenced Standards® provided at the code development hearings:

Analysis: Review of the proposed new standard indicated that, in the opinion of ICC staff, the standard did not comply with ICC standards criteria, Sections 3.6.2.11 and 3.6.3.2.

PART I C IFC

Committee Action:

Disapproved

Committee Reason: It was unclear how the proposed standard for resilient floor coverings would apply to non-coated concrete.

Assembly Action:

None

PART II C IBC GENERAL

Committee Action:

Disapproved

Committee Reason: The standard proposed for inclusion had not been provided for review by the committee.

Assembly Action:

None

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Thomas Joseph, Chair, Hydrogen Industry Panel on Codes, requests Approval as Modified by this public comment for Parts I and II.

Replace Part I of proposal with the following:

2209.5.1.1 Vehicle fueling pad. The vehicle fueling pad shall be of concrete or a material having a resistivity not exceeding 1 megohm as determined by an approved method.

Replace Part II of proposal with the following:

406.5.2 Vehicle fueling pad. The vehicle fueling pad shall be of concrete or a material having a resistivity not exceeding 1 megohm as determined by an approved method.

Commenter's Reason: The current language does not address safety issues associated with electrostatic discharges (ESD). The Public Comment addresses IFC and IBC Committee concerns in that the proposal specifies plain concrete as the transfer surface material of choice, while clearly stating the antistatic performance of alternative materials.

Motor vehicles can acquire an electrostatic charge while traveling. The resistance offered by the tires through an un-coated concrete surface is low enough that this charge dissipates to ground very quickly (seconds or less). However, under dry conditions, an asphalt surface may offer sufficient resistance that the charge will not dissipate in a timely manner. A small number of incidents have occurred in Europe where a non-absorbent polymer, having unusually high resistance, was used at service stations to prevent soil contamination from gasoline spills. Therefore, paved surfaces that result in a resistance greater than one megohm should not be used.

Transfer surface materials meeting the criteria specified will provide for the dissipation of static charge built up on the vehicle before the driver opens the door initiate refueling.

The 1 megohm criteria is cited from the *American Petroleum Institute (API) 2003 Recommended Practices (RP)*. This language has also been proposed by the State of Michigan, Department of Environmental Quality – Waste and Hazardous Materials Division for Michigan's *Hydrogen Storage and Dispensing Rules*, and is consistent with changes proposed under the current cycle to NFPA 55-2005, *Standard for the Storage, Use, and Handling of Compressed Gases and Cryogenic Fluids in Portable and Stationary Containers, Cylinders, and Tanks*. Addition of this language will provide the IFC with electrostatic discharge requirements for hydrogen refueling stations that are as protective as those for petroleum refueling stations with language aligned with modifications proposed to NFPA 55. Measurement of the resistivity of the vehicle fueling pad can be conducted using the *European Standard EN 1081 : 1998 Determination of Electrical Resistance – Resilient Floor Coverings*.

Cost Impact: The code change proposal will increase the cost of construction at service stations where materials other than plain concrete are proposed.

Final Hearing Results

**F156-06/07, Part I
F156-06/07, Part II**

**AMPC1
AMPC1**

Code Change No: F168-06/07

Original Proposal

Table 2703.1.1(1) [IBC Table [F] 307.1(1)], Table 2703.1.1(2) [IBC Table [F] 307.1(2)], 2703.9.10 (New), Chapter 45

Proponent: Lynne M. Kilpatrick, Fire Department, City of Seattle, WA

1. Revise tables as follows:

**TABLE 2703.1.1(1) [IBC [F] TABLE 307.1(1)]
MAXIMUM ALLOWABLE QUANTITY PER CONTROL AREA
OF HAZARDOUS MATERIALS POSING A PHYSICAL HAZARD^{a, j m, n, p}**

- e. Maximum allowable quantities shall be increased 100 percent when stored in approved ~~storage cabinets~~, gas cabinets, exhausted enclosures, listed storage cabinets or listed safety cans. Where Note d also applies, the increase for both notes shall be applied accumulatively.

(Portions of table and footnotes not shown do not change)

**TABLE 2703.1.1(2) [IBC [F] TABLE 307.1(2)]
MAXIMUM ALLOWABLE QUANTITY PER CONTROL AREA
OF HAZARDOUS MATERIALS POSING A HEALTH HAZARD^{a, b, c, j}**

- f. Maximum allowable quantities shall be increased 100 percent when stored in approved ~~storage cabinets~~, gas cabinets, ~~or exhausted enclosures~~ or listed storage cabinets. Where Note e also applies, the increase for both notes shall be applied accumulatively.

2. Add new text as follows:

2703.9.10 Safety cans. Safety cans shall be listed in accordance with UL 30 when used to increase the maximum allowable quantities of flammable or combustible liquids in accordance with Table 2703.1.1(1) or Table 2703.1.1(3). Safety cans listed in accordance with UL 1313 are allowed for flammable and combustible liquids when not used to increase the maximum allowable quantities and for other hazardous material liquids in accordance with the listing.

3. Add standard to Chapter 45 as follows:

Underwriters Laboratories

UL1313-98 Standard for Nonmetallic Safety Cans for Petroleum Products

Reason: Part 1: The addition of "listed" in the footnote Table 2703.1.1 (1) and Table 2703.1.1 (2) for the safety cans and storage cabinets is to ensure that if a 100% increase in the maximum allowable quantity is to be applied for the material, the safety cans or the storage cabinets have met rigorous testing requirements.

UL 30 should be used for requirements covering metal safety cans that have nominal capacities of five gallons (18.9 L) or less and that are primarily intended to store and handle flammable and combustible liquids, such as gasoline, naphtha, kerosene, acetone, MEK, and similar liquids. The standard has over 75 years of experience testing safety cans and conducts 10 different testing phases that include a stability test, drop test, leakage test, handle and nozzle strength test, and fire exposure test.

UL 1313 should be used for requirements that cover nonmetallic safety cans having nominal capacities of 5 Imperial gallons or less and are primarily for the storage of combustible and some flammable liquids. This standard has 15 performance tests including, drop test, leak test, direct flame test, two different fire exposures test to name a few. Footnote (e) is located in many of the material categorize beyond flammable and combustible liquids. The use of this standard allows different materials that can be compatible to the can's construction material and product stored. This change will provide the code official an opportunity to ensure that products that are not compatible with the listed safety can are not stored improperly.

The standard UL 1275 for liquid storage cabinets is a critical safety feature in the storage of flammable and combustible liquids. The use of these cabinets continues to be an option that provides the code official and owner's flexibility for where the liquids can be stored and the ability for smaller (120 gallons) amounts to be located within manufacturing areas to reduce handling throughout the site. UL 1275 provides specific construction requirements for the cabinet, including sheet metal thickness, type joints, air space for the double walls, and venting to name a few. The standard includes a rigorous fire endurance test and leakage test. These add up to a cabinet that provides the needed protection feature to justify the doubling of the maximum allowable quantity for a control area. Currently, UL 1275 has tested many metal and wood cabinets.

Part 2: The addition of this new section will provide guidance to the code user regarding listed safety cans when they are utilized for general safety reasons and when utilized to take advantage of increasing the maximum allowable quantities of hazardous material liquids in a control area. This new Section requires the use of metal safety cans for flammable and combustible liquids if those cans are being used to increase quantities in a control area. It would allow for nonmetallic safety cans listed to UL1313 to be utilized to increase the maximum allowable quantities of other hazardous material liquids in accordance with Table 2703.1.1(1) and for the general safety of flammable and combustible liquids. Including this requirement for a UL listed safety cans in this code cycle provides some advance notice of the potential cost increase prior to publication in the 2009 IFC and allows for business to prepare for such a change.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing Results

Errata: The following was published in the AErrata to the 2006/2007 Proposed Changes to the International Codes and Analysis of Proposed Referenced Standards® provided at the code development hearings:

F168-06/07, Item 5: The correct edition of the proposed referenced standard is AUL 1313-93 B with revisions through May 2003®

Note: The following analysis was not in the Code Change Proposal book but was published in the AErrata to the 2006/2007 Proposed Changes to the International Codes and Analysis of Proposed Referenced Standards® provided at the code development hearings:

Analysis: Review of the proposed new standard indicated that, in the opinion of ICC staff, the standard did comply with ICC standards criteria.

Committee Action:

Approved as Modified

Modify the proposal as follows:

**TABLE 2703.1.1(1) [IBC [F] TABLE 307.1(1)]
MAXIMUM ALLOWABLE QUANTITY PER CONTROL AREA
OF HAZARDOUS MATERIALS POSING A PHYSICAL HAZARD^{a, j m, n, p}**

e. Maximum allowable quantities shall be increased 100 percent when stored in approved storage cabinets, gas cabinets, exhausted enclosures, ~~listed storage cabinets~~ or listed safety cans. Where Note d also applies, the increase for both notes shall be applied accumulatively.

(Portions of table and footnotes not shown remain unchanged)

**TABLE 2703.1.1(2) [IBC [F] TABLE 307.1(2)]
MAXIMUM ALLOWABLE QUANTITY PER CONTROL AREA
OF HAZARDOUS MATERIALS POSING A HEALTH HAZARD^{a, b, c, j}**

f. Maximum allowable quantities shall be increased 100 percent when stored in approved storage cabinets, gas cabinets, or exhausted enclosures ~~or listed storage cabinets~~. Where Note e also applies, the increase for both notes shall be applied accumulatively.

(Portions of proposal not shown remain unchanged)

Committee Reason: Based on the proponent-s reason statement. The proposal adds an important requirement that safety cans be listed to specific standards, depending on their use. The modifications recognize that listed storage cabinets are only listed for flammable and combustible liquid storage and that the current use of the phrase Aapproved storage cabinets® is more appropriate.

Assembly Action:

None

Final Hearing Results

F168-06/07

AM

Code Change No: F169-06/07

Original Proposal

Tables 2703.1.1(1) [IBC Table [F] 307.1(1)], 2703.1.1(2) [IBC Table [F] 307.1(2)], 2703.1.1(3), 2703.1.1(4)

Proponent: Larry Fluor, Fluor, Inc., representing Compressed Gas Association

1. Revise tables as follows:

**TABLE 2703.1.1(1) [IBC [F] 307.1(1)]
MAXIMUM ALLOWABLE QUANTITY PER CONTROL AREA OF
HAZARDOUS MATERIAL POSING A PHYSICAL HAZARD^{a,j,m,n}**

MATERIAL	CLASS	GROUP WHEN THE MAXIMUM ALLOWABLE QUANTITY IS EXCEEDED	STORAGE ^b			USE-CLOSED SYSTEMS ^b		
			Solid pounds (cubic feet)	Liquid gallons (pounds)	Gas cubic feet at NTP	Solid pounds (cubic feet)	Liquid gallons (pounds)	Gas cubic feet at NTP
Flammable gas	Gaseous	H-2	Not Applicable	Not Applicable	1,000 ^{d,e}	Not Applicable	Not Applicable	1,000 ^{d,e}
	Liquefied			(150) ^{3d,e}	Not Applicable		(150) ^{3d,e}	Not Applicable
Oxidizing gas	Gaseous	H-3	Not Applicable	Not Applicable	1,500 ^{d,e}	Not Applicable	Not Applicable	1,500 ^{d,e}
	Liquefied			(150) ^{4d,e}	Not Applicable		(150) ^{4d,e}	Not Applicable

(Portions of table and footnotes not shown do not change)

**TABLE 2703.1.1(2) [IBC [F] 307.1(2)]
MAXIMUM ALLOWABLE QUANTITY PER CONTROL AREA OF
HAZARDOUS MATERIAL POSING A HEALTH HAZARD^{a,b,c,j}**

Material	STORAGE ^d			USE - CLOSED SYSTEMS ^d			USE - OPEN SYSTEMS ^d	
	Solid pounds ^{e,f}	Liquid gallons (pounds) ^{e,f}	Gas Cubic feet (pounds) ^e	Solid pounds ^e	Liquid gallons ^e	Gas Cubic feet (pounds) ^e	Solid pounds ^e	Liquid gallons ^e
Corrosives	5000	500	<u>Gaseous</u> 810 ^{f,g} <u>Liquefied</u> (150) ⁱ	5000	500	<u>Gaseous</u> 810 ^{f,g} <u>Liquefied</u> (150) ⁱ	1000	100
Highly Toxics	10	(10) ⁱ	<u>Gaseous</u> 20 ^h <u>Liquefied</u> (4) ^{h,i}	10	(10) ⁱ	<u>Gaseous</u> 20 ^h <u>Liquefied</u> (4) ^{h,i}	3	(3) ⁱ
Toxics	500	(500) ⁱ	<u>Gaseous</u> 810 ^f <u>Liquefied</u> (150) ^{f,i}	500	(500) ⁱ	<u>Gaseous</u> 810 ^f <u>Liquefied</u> (150) ^{f,i}	125	(125) ⁱ

a. through f. (No change to current text)

~~g. A single cylinder containing 150 pounds or less of anhydrous ammonia in a single control area in a nonsprinklered building shall be considered a maximum allowable quantity. Two cylinders, each containing 150 pounds or less in a single control area shall be considered a maximum allowable quantity provided the building is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.~~

h. through j. Renumber to become g. through i (No change to current text)

**TABLE 2703.1.1(3)
MAXIMUM ALLOWABLE QUANTITY PER CONTROL AREA OF HAZARDOUS MATERIAL
POSING A PHYSICAL HAZARD IN AN OUTDOOR CONTROL AREA^{a,b,c}**

MATERIAL	CLASS	GROUP WHEN THE MAXIMUM ALLOWABLE QUANTITY IS EXCEEDED	STORAGE ^b			USE-CLOSED SYSTEMS ^b		
			Solid pounds (cubic feet)	Liquid gallons (pounds)	Gas cubic feet at NTP	Solid pounds (cubic feet)	Liquid gallons (pounds)	Gas cubic feet at NTP
Flammable gas	Gaseous	H-2	Not Applicable	Not Applicable	3000	Not Applicable	Not Applicable	1500
	Liquefied			(300) 30	Not Applicable			
Oxidizing gas	Gaseous	H-3	Not Applicable	Not Applicable	6000	Not Applicable	Not Applicable	3000
	Liquefied			(600) 60	Not Applicable			

(Portions of table and footnotes not shown do not change)

**TABLE 2703.1.1(4)
MAXIMUM ALLOWABLE QUANTITY PER CONTROL AREA OF HAZARDOUS MATERIAL
POSING A HEALTH HAZARD IN AN OUTDOOR CONTROL AREA^{a,b,c}**

Material	STORAGE			USE - CLOSED SYSTEMS			USE - OPEN SYSTEMS	
	Solid pounds	Liquid gallons (pounds)	Gas Cubic feet (pounds)	Solid pounds	Liquid gallons	Gas Cubic feet (pounds)	Solid pounds	Liquid gallons
Corrosives	20,000	2,000	<u>Gaseous</u> 1,620 ^g <u>Liquefied</u> (300) ^f	10,000	1,000	<u>Gaseous</u> 810 ^g <u>Liquefied</u> (150) ^f	1,000	100
Highly Toxic	20	(20) ⁱ	<u>Gaseous</u> 40 ^d <u>Liquefied</u> (8) ^{d,t}	10	(10) ⁱ	<u>Gaseous</u> 20 ^d <u>Liquefied</u> (4) ^{d,t}	3	(3) ⁱ
Toxics	1,000	(1,000) ^{e,t}	<u>Gaseous</u> 1,620 <u>Liquefied</u> (300) ^f	500	50 ^c	<u>Gaseous</u> 810 <u>Liquefied</u> (150) ^f	25	(25) ^{e,t}

a. through f. (No change to current text)

~~g. Two cylinders, each cylinder containing 150 pounds or less of anhydrous ammonia, shall be considered a maximum allowable quantity in an outdoor control area.~~

Reason: (General) applicable to all tables: The unit of measure for liquefied gases has historically been incorporated into the MAQ tables in terms of gallons as it has been conventional to think of ordinary liquids in terms of gallons. From a practical standpoint the use of gallons as a unit of measure for liquefied gases introduces an inconsistency into the concept due to the fact that unlike most liquids the density of liquefied gases varies widely. In commerce, liquefied gases are packaged and distributed based on weight being used as the unit of measure. Revising the MAQ tables to reflect threshold quantities in terms with units of measure that are readily available from the commercial market will greatly simplify the use of the code thereby making it more user friendly. To do so requires that a model be used as the basis for comparison. This approach was taken when thresholds were revised to base certain health hazard thresholds levels using a “chlorine index” as the model. A similar approach is proposed as a means to simplify the use of these tables.

Table 2703.1.1(1): Flammable gases (liquefied): In the case of liquefied flammable gases probably the most commonly encountered liquefied gas is LPG. LPG as defined can consist of propane, butane, propylene or others either in a mixed or pure form. NFPA 58 Table B.1.2(a) lists the approximate densities of commercial propane and butane at 60 degrees F as 4.20 and 4.81 pounds per gallon respectively. Converting the 30 gallon quantity to pounds and rounding up to the closest five pounds yields a quantity of 150 pounds on a weight basis. The density of butane is greater than that of propane therefore representing the worst case where mixtures of propane and butane are involved. The result of converting the 30 gallon threshold to a 150 pound threshold is in keeping with the philosophical approach used with gases such as ammonia and chlorine as they appear in Table 2703.1.1(2).

Oxidizing gases (liquefied): The threshold level of 15 gallons for oxidizing gases can be expressed in terms of weight based on using any of a number of oxidizing gases as the baseline. However, given the fact that a single cylinder of chlorine (an oxidizing, corrosive and toxic gas) has been used as the baseline in Table 2703.1.1(2) it is reasonable to use a single cylinder of chlorine as the baseline for the establishment of quantity in Table 2703.1.1(1) as well. To test the assumption a comparison was made to the 1500 cubic foot baseline maximum quantity for a non-liquefied gas using oxygen as the model. Using a specific volume for oxygen of 12.1 cubic feet per pound translates the 1500 cubic feet allowed for the baseline MAQ to 125 pounds if this gas was considered on a weight basis. The use of 150 pounds as a baseline quantity for liquefied oxidizing gases resolves the problem where a single cylinder of chlorine would NOT trip the H-4 threshold, but WOULD trip the H-3 threshold where arguably the inherent health hazards of the gas may represent a greater concern for public safety than do the physical hazards of the same gas.

It is recognized that this approach may appear to represent a major increase in the threshold for liquefied oxidizing gases; however, it brings the threshold levels into parity with those of liquefied flammable gases which may represent the greater hazard given the potential for fire and/or explosion. The example using oxygen as the baseline shows that an increase is justified. By supporting the change there is established a clear rationale that is based on practical examples of materials commonly found in commerce which have generally been accepted for use as the threshold for an increased level of control. In addition, the use of weight as a unit of measure brings the code into sync with units typically used by the suppliers of these products thereby mitigating the need for elaborate conversions into units of measure not found in common use.

Table 2703.1.1(2): The MAQ for corrosive and toxic gases established in Table 2703.1.1(2) of 810 cubic feet was based on a single cylinder of chlorine. Footnote g in the table was added to recognize that a single cylinder of ammonia should be allowed, however, the use of 810 did not allow for this given the fact that by comparison a 150 pound cylinder of ammonia contains over 3,300 cubic feet of gas. The preferred solution in lieu of trying to justify or create a series of footnotes to address individual gases is to use an index system that establishes a standardized approach. The concept of using a widely distributed gas such as chlorine as an index to establish the unit of measure has been established. However, the unit of measure in terms of weight was not carried into the table when it was formulated thereby creating the need for the use of footnotes to address ammonia. Compressed gases may be in liquid form or they may be gaseous. By maintaining the use of chlorine as the index to the table for toxic and corrosive properties and listing the threshold for liquefied gases as well as those that are nonliquefied eliminates the need for elaborate conversions in units of measure using data that in many cases is not readily available. The index used to establish the weight threshold is based on the use of arsine, a highly toxic gas with a specific volume of 5.0 cubic feet per pound.

It may be argued that by recognizing the common forms of gases, e.g., liquefied and nonliquefied allows a defacto increase in the threshold levels applied. It is possible that one could have a toxic gas that is liquefied and also one that is nonliquefied in the same area therefore doubling the aggregate quantity of gas if all was considered. While this is theoretically possible, it is not considered to be the norm. In addition, there is precedent in using the approach as established in Table 2703.1.1(1) for flammable and oxidizing gases.

Table 2703.1.1(3): The concept of "outdoor control areas" was introduced into the code as a means to establish a threshold where the general provisions of Chapter 27 would apply. When Table 2703.1.1(3) was created the logic for assignment of threshold values was primarily based on the use of multipliers representing a multiple increase of the basic tabular values shown in Table 2703.1.1(1). In the First Draft of the code Table 2703.1.1(3) was Table 2803.1-C and the quantities of gaseous and liquefied flammable gases were limited to 1500 cubic feet and 15 gallons respectively. The result was that the threshold level for liquefied flammable gases in interior areas was greater than that allowed for the same commodity when stored in outdoor areas. Assuming that the threshold level of 30 gallons for indoor areas was correct, the value of 15 gallons shown for outdoor areas is believed to have been in error. Code change F1324-98 submitted by proponent Mr. George G. Verbruyck increased the threshold quantities for flammable and oxidizing gases (as well as a number of other commodities including combustible liquids, cryogenics, flammable liquids, flammable solids, organic peroxides, oxidizers, pyrophorics, unstable reactives and water reactives) in storage in outdoor areas by a factor of 2 resulting in the increase to for liquefied flammable gases from 15 to 30 gallons, and the inconsistency was perpetuated.

There may be those that argue that the 30 gallon threshold imposed by Table 2703.1.1(1) should have been 15 gallons when the First Draft was printed; however, it appears that the 30 gallon limit was established and the inconsistencies that followed have been perpetuated. The proposed code change is made to 1) correct the inconsistency in the table for liquefied flammable gases, and 2) to change the unit of measure to units of weight rather than those of volume to eliminate confusing and elaborate calculations thereby bringing the code closer into harmony with the commercial environment. The index system used to obtain a unit of measure for weight is based on multiples for a single 150 pound cylinder of butane for flammable gases and a single 150 pound cylinder for chlorine. The change made for oxidizing gases has been made for consistency and to correlate in concept with conversion to a weight basis.

Table 2703.1.1(4): A weight unit of measure has been established for liquefied gases, and the table has been revised to recognize that these materials may exist in liquid as well as gaseous form. The index system used to establish the quantity for toxics and corrosives is based on multiples of a single 150 pound cylinder of chlorine. The index system used to establish the threshold quantity for highly toxic liquefied gases is based on arsine, a highly toxic gas with a specific volume of 5.0 cubic feet per pound.

In preparing this code change it appears that the quantities listed for toxic solids and liquids in open use are in error, and that the 25 pounds indicated should be 125 pounds in each case. The original code change was introduced as F1309-98 by Mr. George V. Verbruyck. By using weight rather than cubic footage as a unit of measure, there is not need to perpetuate footnote g as the variability of density has been accommodated. Both ammonia and chlorine are packaged as liquefied compressed gases.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: Based on the proponent's reason statement. The proposal revises the tables to reflect a more accurate, standardized measurement of liquefied gases.

Assembly Action:

None

Final Hearing Results

F169-06/07

AS

Code Change No: F171-06/07

Original Proposal

Sections: 2704.7 (IBC [F] 414.5.4)

Proponent: Larry Fluer, Fluer, Inc., representing Compressed Gas Association

Revise as follows:

2704.7 Standby or emergency power. Where mechanical ventilation, treatment systems, temperature control, alarm, detection or other electrically operated systems are required, such systems shall be provided with an emergency or standby power system in accordance with the ICC *Electrical Code* and Section 604.

Exceptions:

1. Storage areas for Class 1 and 2 oxidizers.
2. Storage areas for Class II, III, IV and V organic peroxides.
3. Storage areas for asphyxiant, irritant and radioactive gases.
- ~~3.~~ 4. For storage areas for highly toxic or toxic materials, see Sections 3704.2.2.8 and 3704.3.2.6.
4. 5. Standby power for mechanical ventilation, treatment systems and temperature control systems shall not be required where an approved fail-safe engineered system is installed.

Reason: Unlike the requirements for other hazard categories which use the Maximum Allowable Quantity Per Control Area (MAQ) as a trigger threshold, the requirement for ventilation in storage areas containing asphyxiant, irritant and radioactive gases is not quantity based. Ventilation under the requirements of Section 3007.2 is only required in storage areas when the building is occupied.

Providing ventilation in areas where compressed gases are stored or used is fundamental, whether standby power as a redundant control is fundamental for any quantity of this particular group of gases is warranted is questionable given the fact that standby or emergency power is not required for flammables, corrosives, oxidizing, toxic, highly toxic, unstable reactive or other hazard classes until the MAQ is exceeded. An MAQ was not established for this group of materials when the provision was introduced to the code based on the lack of defined physical or health hazards that represent the Group H occupancies in general.

The construction of compressed gas containers is robust compared to the containers used for other materials that may be of glass, plastic or paper. The integrity of the containers alone represents a major safeguard against likely failure. While leakage from containers is a consideration the concern the reestablishment of power to the ventilation system within a 60 second period is not warranted given the fact that the requirement could be imposed for insignificant quantities of the gas, and given the fact that occupancy of a storage area during power out conditions is not the norm.

The change to Exception 2 to add Class II organic peroxides to the list of exceptions is to correlate the requirements with Section 3904.1.11 which requires standby power only for Class I and unclassified detonable organic peroxides.

IBC: Correlation with IFC Section 2704.7. Exception No. 1, the characters for oxidizers should be Arabic not Roman. Exception. 2 is to correlate with IFC Section 3904.1.11.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: Based on the proponent-s reason statement. The proposal will provide correlation between Sections 2704.7 and 3007.2.

Assembly Action:

None

Final Hearing Results

F171-06/07

AS

Code Change No: **F208-06/07**

Original Proposal

Chapter 45, Sections: 2605.4, 3003.2, 3203.4.3, 3203.8, 3301.1, 3301.1.3, 3301.3, 3302.1, 3406.5.1.15

Proponent: Larry Fluer, Fluer, Inc., representing Compressed Gas Association

1. Revise Chapter 45 as follows:

DOTn

U.S. Department of Transportation
Office of Hazardous Material Standards
400 7th Street, Southwest
Washington, DC 20590

Standard reference number	Title	Referenced in code section number
33 CFR Part 154 — 1998	Facilities Transferring Oil or Hazardous Material in Bulk	3406.8
33 CFR Part 155 — 1998	Oil or Hazardous Material Pollution Prevention Regulations for Vessels	406.8
33 CFR Part 156 — 1998	Oil and Hazardous Material Transfer Operations	3406.8
49 CFR — 1998	Transportation	2605.4, 3302.1
49 CFR Part 1 — 1999	Transportation	3203.4.3, 3203.8
49 CFR Part 172 — 1999–2005	Hazardous Materials Tables, Special Provisions, Hazardous Materials Communications, Emergency Response Information and Training Requirements	3304.6.5.2
49 CFR Part 173 — 1999–2005	Shippers — General Requirements for Shipments and Packagings	3306.3
49 CFR Part 173.137 — 1999–2005	Shippers — General Requirements for Shipments and Packagings: Class 8 — Assignment of Packing Group 3102.1	
49 CFR Parts 100-178 — 1994	Hazardous Materials Regulations	3301.1, 3301.1.3, 3301.3, 3406.5.1.15
49 CFR Parts 100 to 185 - 2005	Hazardous Materials Regulations	2605.4, 3003.2, 3203.4.3, 3203.8, 3301.1, 3301.1.3, 3301.3, 3302.1, 3406.5.1.15

2. Revise as follows:

2605.4 Acetylene gas. Acetylene gas shall not be piped except in approved cylinder manifolds and cylinder manifold connections, or utilized at a pressure exceeding 15 pounds per square inch gauge (psig) (103 kPa) unless dissolved in a suitable solvent in cylinders manufactured in accordance with DOTn 49 CFR Part 178. Acetylene gas shall not be brought in contact with unalloyed copper, except in a blowpipe or torch.

3003.2 Design and construction. Compressed gas containers, cylinders and tanks shall be designed, fabricated, tested, marked with the specifications of manufacture and maintained in accordance with regulations of DOTn 49 CFR, Parts 100-~~178~~ 185 or the ASME *Boiler and Pressure Vessel Code*, Section VIII.

3203.4.3 Identification of containers. Stationary containers shall be identified with the manufacturing specification and maximum allowable working pressure with a permanent nameplate. The nameplate shall be installed on the container in an accessible location. The nameplate shall be marked in accordance with the ASME *Boiler and Pressure Vessel Code* or DOTn 49 CFR Parts 100-185.

3203.8 Service and repair. Service, repair, modification or removal of valves, pressure relief devices or other container appurtenances, shall comply with Sections 3203.8.1 and 3203.8.2 and the ASME *Boiler and Pressure Vessel Code*, Section VIII or DOTn 49 CFR Parts 100-185.

3301.1 Scope. The provisions of this chapter shall govern the possession, manufacture, storage, handling, sale and use of explosives, explosive materials, fireworks and small arms ammunition.

Exceptions:

1. The Armed Forces of the United States, Coast Guard or National Guard.
2. Explosives in forms prescribed by the official United States Pharmacopoeia.
3. The possession, storage and use of small arms ammunition when packaged in accordance with DOTn packaging requirements.
4. The possession, storage, and use of not more than 1 pound (0.454 kg) of commercially manufactured sporting black powder, 20 pounds (9 kg) of smokeless powder and 10,000 small arms primers for hand loading of small arms ammunition for personal consumption.
5. The use of explosive materials by federal, state and local regulatory, law enforcement and fire agencies acting in their official capacities.
6. Special industrial explosive devices which in the aggregate contain less than 50 pounds (23 kg) of explosive materials.
7. The possession, storage and use of blank industrial-power load cartridges when packaged in accordance with DOTn packaging regulations.
8. Transportation in accordance with DOTn 49 CFR Parts 100-478 185.
9. Items preempted by federal regulations.

3301.1.3 Fireworks. The possession, manufacture, storage, sale, handling and use of fireworks are prohibited.

Exceptions:

1. Storage and handling of fireworks as allowed in Section 3304.
2. Manufacture, assembly and testing of fireworks as allowed in Section 3305.
3. The use of fireworks for display as allowed in Section 3308.
4. The possession, storage, sale, handling and use of specific types of Division 1.4G fireworks where allowed by applicable laws, ordinances and regulations, provided such fireworks comply with, CPSC 16 CFR, Parts 1500 and 1507, and DOTn 49 CFR, Parts 100-478 185, for consumer fireworks.

3301.3 Prohibited explosives. Permits shall not be issued or renewed for possession, manufacture, storage, handling, sale or use of the following materials and such materials currently in storage or use shall be disposed of in an approved manner.

1. Liquid nitroglycerin.
2. Dynamite containing more than 60-percent liquid explosive ingredient.
3. Dynamite having an unsatisfactory absorbent or one that permits leakage of a liquid explosive ingredient under any conditions liable to exist during storage.
4. Nitrocellulose in a dry and uncompressed condition in a quantity greater than 10 pounds (4.54 kg) of net weight in one package.
5. Fulminate of mercury in a dry condition and fulminate of all other metals in any condition except as a component of manufactured articles not hereinafter forbidden.
6. Explosive compositions that ignite spontaneously or undergo marked decomposition, rendering the products of their use more hazardous, when subjected for 48 consecutive hours or less to a temperature of 167°F (75°C).
7. New explosive materials until approved by DOTn, except that permits are allowed to be issued to educational, governmental or industrial laboratories for instructional or research purposes.
8. Explosive materials condemned by DOTn.
9. Explosive materials containing an ammonium salt and a chlorate.
10. Explosives not packed or marked as required by DOTn 49 CFR, Parts 100-478 185.

Exception: Gelatin dynamite.

3302.1 Definitions. The following words and terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

EXPLOSIVE. A chemical compound, mixture or device, the primary or common purpose of which is to function by explosion. The term includes, but is not limited to, dynamite, black powder, pellet powder, initiating explosives, detonators, safety fuses, squibs, detonating cord, igniter cord, igniters and display fireworks, 1.3G (Class B, Special).

The term “explosive” includes any material determined to be within the scope of USC Title 18: Chapter 40 and also includes any material classified as an explosive other than consumer fireworks, 1.4G (Class C, Common) by the hazardous materials regulations of DOTn 49 CFR Parts 100-185.

3406.5.1.15 Tank vehicle and tank car certification. Certification shall be maintained for tank vehicles and tank cars in accordance with DOTn 49 CFR, Parts 100-178 185.

Reason: The DOT revises the Hazardous Materials Regulations (HMR) annually. The annual cycle for revisions to Title 49 occurs in October. 49 CFR in its entirety is found under Title 49 Transportation, Volume 2, Chapter 1 – Research and Special Programs Administration, Department of Transportation, Parts 100 through 185 under Subtitle B – Other Regulations Relating to Transportation. A similar code change was submitted in the last code cycle, and a question was raised by a committee member regarding what was new in Parts 179 through 185. Part 179 is titled Specifications for tank cars; Part 180 is titled Continuing qualification and maintenance of packagings, Parts 181 through 185 are designated as Reserved (meaning there is no content at present); however, the use of the full title to include Parts 100 through 185 is how the document is described and listed by the US Government Printing Office, and as accessed by electronic means.

The use of DOT references in the IFC refer the user to Federal Regulations which use is mandatory. As such the general reference found in the code to the HMR is a pointer or an index to point the user in the right direction to obtain detailed regulatory requirements.

General references to “Transportation” (meaning the HMR) have been combined under the last row in the table to eliminate redundancy. The code change proposal is being submitted to update the reference to the most recent Federal publication. By the time this code change is processed the regulations will have again been revised.

As a result of issuing the 2005 update to 49 CFR, correlating changes are proposed to Sections 2605.4, 3003.2, 3102.1, 3203.4.3, 3203.8, 3301.1, 3301.1.3, 3301.3, 3302.1, 3304.6.5.2, 3406.5.1.15. Specific substantiating statements for each of the aforementioned changes to the sections referenced are as follows:

Section 2605.4: Part 178 is titled Specifications for Packagings. Specifications for cylinders are found in Subpart C to Part 178.

Section 3003.2: Part 179 contains specifications for cargo tank cars, tank car tanks including multi-unit tank car tanks. Part 180 contains requirements for the Continuing Qualification and Maintenance of Packagings.

Section 3102.1: The reference in Chapter 45 has been updated to the 2005 edition of the CFR. There are no changes proposed to Section 3102.1.

Section 3203.4.3: Stationary cryogenic containers are typically constructed to ASME Boiler and Pressure Vessel Code requirements. DOT regulations typically apply to containers that are used in the transportation phase. In some instances DOT containers have been viewed as stationary containers, for example, when connected to piping systems serving fixed facilities. 49CFR178 addresses Specifications for Packagings. General requirements in Section 178.35(f) specify the types of markings that are required along with their placement. Subsection 178.338 provides requirements for specification MC-338 cargo tanks. Marking requirements are found in 178.338-18.

Section 3203.8: From a practical standpoint service and repairs of valves, pressure relief devices and appurtenances on cryogenic vessels is done in accordance with nationally recognized standards including those published by the Compressed Gas Association. When repairs are done on containers manufactured to ASME or DOT specifications prescriptive provisions are applied based on the specifications of manufacture.

Section 3301.1, Item 8: The listed reference to Parts 100-178 of the 1994 Edition of the CFR is obsolete. A general reference to Parts 100-185 – 2005 updates the code with a current reference.

Section 3301.1.3: The listed reference to Parts 100-178 of the 1994 Edition of the CFR is obsolete. A general reference to Parts 100-185 – 2005 updates the code with a current reference.

Section 3301.3, Item 10: The listed reference to Parts 100-178 of the 1994 Edition of the CFR is obsolete. A general reference to Parts 100-185 – 2005 updates the code with a current reference.

Section 3302.1 (Explosive): 49CFR specifies the materials classified as explosives. The use of the terminology is found within several different sections of 49CFR including Parts 171, 172 and 173. The all encompassing reference to DOTn 49CFR Parts 100 – 185 correlates with the general reference listed in the existing code, e.g., DOTn 49 CFR without changing the intent of the reference.

Section 3304.6.5.2: 49CFR172.504 specifies the general placarding requirements for explosive materials. There are no changes proposed to Section 3304.6.5.2.

Section 3406.5.1.15: Tank vehicle and tank car certification. The reference to Parts 100 to 178 is obsolete. Specifications for cargo tank motor vehicles are found in Section 178 and specifications for tank cars are found in Section 179.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: Based on the proponent-s published reason statement. The proposal provides a much-needed and appropriate update to the IFC referenced US DOTn standards.

Assembly Action:

None

Final Hearing Results

F208-06/07

AS

Code Change No: **F218-06/07**

Original Proposal

Sections: IBC [F] 307.1

Proponent: Gregory R. Keith, Professional heuristic Development, representing the Boeing Company

Revise as follows:

[F] 307.1 High-hazard Group H. High-hazard Group H occupancy includes, among others the use of a building or structure, or a portion thereof, that involves the manufacturing, processing, generation or storage of materials that constitute a physical or health hazard in quantities in excess of those allowed in Tables 307.1(1) and 307.1(2) per control areas as constructed and located as required in Section 414. Hazardous occupancies ~~uses~~ are classified in Groups H-1, H-2, H-3, H-4 and H-5 and shall be in accordance with this section, the requirements of Section 415 and the *International Fire Code*.

Exceptions: The following shall not be classified ~~as in~~ Group H, but shall be classified as in the occupancy that they most nearly resemble.

- ~~1.~~ ~~Buildings and structures that contain not more than the maximum allowable quantities per control area of hazardous materials as shown in Tables 307.1(1) and 307.1(2), provided that such buildings are maintained in accordance with the *International Fire Code*.~~
- ~~2.~~ ~~Buildings utilizing control areas in accordance with Section 414.2 that contain not more than the maximum allowable quantities per control area of hazardous materials as shown in Tables 307.1(1) and 307.1(2).~~
- ~~3.~~ 1. Buildings and structures occupied for the application of flammable finishes, provided that such buildings or areas conform to the requirements of Section 416 and the *International Fire Code*.
- ~~4.~~ 2. Wholesale and retail sales and storage of flammable and combustible liquids in mercantile occupancies conforming to the *International Fire Code*.
- ~~5.~~ 3. Closed piping containing flammable or combustible liquids or gases utilized for the operation of machinery or equipment.
- ~~6.~~ 4. Cleaning establishments that utilize combustible liquid solvents having a flash point of 140° (60°C) or higher in closed systems employing equipment listed by an approved testing agency, provided that this occupancy is separated from all other areas of the building by 1-hour fire barriers or 1-hour horizontal assemblies or both.
- ~~7.~~ 5. Cleaning establishments that utilize a liquid solvent having a flash point at or above 200°F (93°C).
- ~~8.~~ 6. Liquor stores and distributors without bulk storage.
- ~~9.~~ 7. Refrigeration systems.
- ~~10.~~ 8. The storage or utilization of materials for agricultural purposes on the premises.
- ~~11.~~ 9. Stationary batteries utilized for facility emergency power, uninterrupted power supply or telecommunication facilities, provided that the batteries are provided with safety venting caps and ventilation is provided in accordance with the *International Mechanical Code*.
- ~~12.~~ 10. Corrosives shall not include personal or household products in their original packaging used in retail display or commonly used building materials.
- ~~13.~~ 11. Buildings and structures occupied for aerosol storage shall be classified as Group S-1, provided that such buildings conform to the requirements of the *International Fire Code*.
- ~~14.~~ 12. Display and storage of nonflammable solid and nonflammable or noncombustible liquid hazardous materials in quantities not exceeding the maximum allowable quantity per control area in Group M or S occupancies complying with Section 414.2.5.
- ~~15.~~ 13. The storage of black powder, smokeless propellant and small arms primers in Groups M and R-3 and special industrial explosive devices in Groups B, F, M and S, provided such storage conforms to the quantity limits and requirements prescribed in the *International Fire Code*.

Reason: Section 307.1 was modified in the 2006 Edition of the International Building Code. In an attempt to clarify the provisions of the code, one key point was missed. The appropriate and necessary reference to Tables 307.1(1) and 307.1(2) was removed from the enabling text. It is generally expected that one would find the technical charging requirement for Tables 307.1 in Section 307.1. The concept of maximum allowable quantities of hazardous materials based on Tables 307.1(1) and 307.1(2) is absolutely fundamental to the proper classification of Group H occupancies. This proper legal reference should be established in the charging text. It is noted that the reference to the tables first occurs in

Exception 1. Exceptions represent exceptions to the rule. What now occurs in Exception 1, is the rule. Accordingly, it is proposed to reintroduce the proper cross reference to Tables 307.1(1) and 307.1(2) into Section 307.1. Having done this, it renders Exception 1 as redundant and moot. Also, Exception 1 contains an IFC maintenance provision as a condition of classification as a non-Group H occupancy. Is this to say that buildings not maintained in accordance with the *International Fire Code* must be classified as Group H occupancies? This represents a potentially unenforceable provision. Additionally, Exception 2 is redundant as the control area concept is already addressed in Section 307.1. Approval of this proposal will clarify the code and increase uniformity in the proper classification of Group H occupancies.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: Based on the proponent's reason statement. The proposal adds a needed reference to restore clarity to the text in referencing the appropriate tables and deletes redundant text.

Assembly Action:

None

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Jeffrey Shapiro, PE, FSFPE, International Code Consultants, representing The Chlorine Institute, requests Approval as Modified by this public comment.

Modify proposal as follows:

[F] 307.1 High-hazard Group H. High-hazard Group H occupancy includes, among others the use of a building or structure, or a portion thereof, that involves the manufacturing, processing, generation or storage of materials that constitute a physical or health hazard in quantities in excess of those allowed in ~~Tables 307.1(1) and 307.1(2) per control areas complying with Section 414, as based on the maximum allowable quantity limits for control areas set forth in Tables 307.1(1) and 307.1(2) constructed and located as required in Section 414.~~ Hazardous occupancies are classified in Groups H-1, H-2, H-3, H-4 and H-5 and shall be in accordance with this section, the requirements of Section 415 and the *International Fire Code*.

(Portions of proposal not shown remain unchanged)

Commenter's Reason: This public comment provides an editorial clean-up of the change made by this proposal to ensure that the section cannot be read to suggest that only a single control area is permitted, which was possible with the original wording.

Final Hearing Results

F218-06/07

AMPC1

Code Change No: F223-06/07

Original Proposal

Section: IBC [F] 414.1.3

Proponent: Robert J. Davidson, Davidson Code Concepts, LLC, representing himself

Revise as follows:

[F] 414.1.3 Information required. The hazardous material(s) to be used or stored shall be submitted with the maximum amount expected to be present for each classification of physical or health hazard as indicated in Tables 307.1(1) and 307.1(2). The submittal shall include a description of how the material will be used or stored. Separate floor plans shall be submitted for buildings and structures with an occupancy in Group H ; separate floor plans

shall be submitted identifying the locations of anticipated contents and processes so as to reflect the nature of each occupied portion of every building and structure. A report identifying hazardous materials including, but not limited to, materials representing hazards that are classified in Group H to be stored or used, shall be submitted and the methods of protection from such hazards shall be indicated on the construction documents. The opinion and report shall be prepared by a qualified person, firm or corporation approved by the building official and shall be provided without charge to the enforcing agency.

Reason: Applying Section 307.1 requires that the code official know what classes and total amounts of hazardous materials in each class are to be present at any one time. Sections 307.1.1, 414.1.1 and 414.1.2 make it clear that hazardous materials in any quantity must comply with Section 414 and the *International Fire Code*. This language would indicate that the intent of the code is that the code official is entitled to have a listing of materials supplied for review against code requirements. However, the existing language found at [F] 414.1.3 limits the submission of additional information concerning the hazardous materials to Group H occupancies only.

The first problem with the existing language is that the code official needs information on the hazardous materials submitted to make a determination of the H Group, not after the determination is made. The second problem is that regardless of the Group H designation the code official needs to know what materials are to be present to apply Section 414 of the IBC and the appropriate chapters of the International Fire Code.

This proposal clarifies the need for a submittal of information concerning what hazardous materials will be present including maximum amounts to be provided for each hazard classification as referenced in Tables 307.1(1) and 307.1(2). It includes that a description of how the materials will be used or stored to be submitted to assist in identifying what hazards may be created by the handling or use of the material. This will assist the code official in making a proper determination of whether or not an H Group is involved and will provide needed information for applying Section 414 and appropriate Chapters of the International Fire Code whenever hazardous materials are present. It also clarifies that the submitter shall do the analysis necessary to provide a classification breakdown with total amounts in each class as compared to just submitting a listing of materials and leaving the code official the job of totaling up the amount in each class.

If the determination of a Group H is made the more extensive requirements for separate floor plans and a report prepared by a qualified person, firm or corporation would continue to apply unchanged other than an editorial revision to the language.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: Based on the proponent's reason statement. The proposal provides clarification regarding the submittal of hazardous material information.

Assembly Action:

None

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Jeffrey Shapiro, PE, FSFPE, International Code Consultants, representing the Chlorine Institute, requests Approval as Modified by this public comment.

Modify proposal as follows:

~~[F] 414.1.3 Information required. The hazardous material(s) to be used or stored shall be submitted with the maximum amount expected to be present for each classification of physical or health hazard as indicated in Tables 307.1(1) and 307.1(2). The submittal shall include a description of how the material will be used or stored. For buildings and structures with an occupancy in Group H, separate floor plans shall be submitted identifying the locations of anticipated contents and processes so as to reflect the nature of each occupied portion of every building and structure. A report shall be submitted to the code official identifying the maximum expected quantities of hazardous materials to be stored, used in a closed system and used in an open system, and subdivided to separately address hazardous materials classification categories based on Tables 307.1(1) and 307.1(2), including, but not limited to, materials representing hazards that are classified in Group H to be stored or used, shall be submitted and The methods of protection from such hazards, including but not limited to control areas, fire protection systems and Group H occupancies shall be indicated in the report and on the construction documents. The opinion and report shall be prepared by a qualified person, firm or corporation approved by the building official and shall be provided without charge to the enforcing agency.~~

Commenter's Reason: The approved change, which involved adding a new first sentence to this section, created overlap and inconsistency between the beginning and the end of the paragraph. The revisions maintain and better execute the intent of the proponent, while eliminating inconsistencies.

Final Hearing Results

F223-06/07

AMPC1

Code Change No: **F224-06/07**

Original Proposal

Sections: IBC [F] 415.3.2, [F] 415.2, [F] 307.2

Proponent: Gregory R. Keith, Professional heuristic Development, representing the Boeing Company

1. Revise as follows:

[F] 415.3.2 Group H-1 and H-2 or H-3 detached buildings. The storage of hazardous materials in excess of those amounts listed in Table 415.3.2 shall be in accordance with the provisions of Section 415.5. Where a detached building is required by Table 415.3.2, there are no requirements for wall and opening protection based on fire separation distance.

2. Delete without substitution:

[F] 307.2 Definitions. The following words and terms shall, for the purposes of this section and as used elsewhere in this code, have the meanings shown herein.

~~**DETACHED BUILDING.** A separate single-story building, without a basement or crawl space, used for the storage or use of hazardous materials and located an approved distance from all structures.~~

3. Add new text as follows:

[F] 415.2 Definitions. The following words and terms shall, for the purposes of this chapter and as used elsewhere in the code, have the meanings shown herein.

DETACHED BUILDING. A separate single-story building, without a basement or crawl space, used for the storage or use of hazardous materials and located an approved distance from all structures.

Reason: Table 415.3.2 currently is not formally enabled by the text in Section 415.3.2. This proposal corrects this circumstance. Technical requirements in tables are generally legally established by proper charging language in the corresponding text sections in order to assist users in the proper determination of such requirements. Editorial convention, however, is to title a table based on that section where the term first appears in the code. In this instance, Section 415.5 provides the root requirement for detached buildings and enables Table 415.3.2. The proposed included cross reference will assist users in ascertaining those additional schematic requirements located in Section 415.5. Additionally, the definition of "detached building" has been relocated from Chapter 3 to Chapter 4. In this proper location, it can support applicable technical requirements. Approval of this proposal will clarify the code and increase uniformity in the proper determination of detached building requirements.

Cost Impact: The code change will not increase the cost of construction.

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The proposal does not include a reference to Section [F] 415.4, which also applies to Group H-1.

Assembly Action:

None

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Gregory R. Keith, Professional heuristic Development, representing the Boeing Company, requests Approval as Modified by this public comment.

Modify proposal as follows:

[F] 415.3.2 Group H-1 and H-2 or H-3 detached buildings. The storage of hazardous materials in excess of those amounts listed in Table 415.3.2 shall be in accordance with the applicable provisions of Sections 415.4 and 415.5. Where a detached building is required by Table 415.3.2, there are no requirements for wall and opening protection based on fire separation distance.

(Portions of proposal not shown remain unchanged)

Commenter's Reason: Table 415.3.2 currently is not formally enabled by the text in Section 415.3.2. This proposal corrects this oversight. It was pointed out during committee discussion in Orlando, that as written, one could interpret the provision as neglecting certain Group H-1 requirements. The proposal has been modified to address that concern.

Technical requirements in tables should be legally established by proper charging language in the text sections. Additionally, the definition of "detached building" has been relocated from Chapter 3 to Chapter 4. In this proper location, it can support applicable technical requirements. Approval of this proposal will clarify the code and increase uniformity in the proper determination of detached building requirements.

Final Hearing Results

F224-06/07

AMPC1

Code Change No: F225-06/07

Original Proposal

Section: IBC [F] 416.4 (New)

Proponent: Robert J. Davidson, Davidson Code Concepts, LLC, representing himself

Add new text as follows:

[F] 416.4 Spray booths. Spray booths shall be designed, constructed and operated in accordance with the International Fire Code.

(Renumber subsequent sections)

Reason: Section 416 applies to the construction, installation and use of buildings and structures for the application of flammable finishes. Existing language provides limited information for spray rooms, Section 416.2, and spraying spaces, Section 416.3, leading one to believe there are no such requirements for spray booths. The proposed language simply places a pointer to the *International Fire Code* for the specifics of designing, constructing or operating spray booths and makes it clear that the intent of Section 416 includes spray booths.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: Based on the proponent's reason statement. The proposal clarifies that the intent of Section [F] 416 is to be applicable to paint spray booths as well as spray rooms and spray space.

Assembly Action:

None

Final Hearing Results

F225-06/07

AS

Code Change No: **F232-06/07**

Original Proposal

Sections: IBC [F] 415.6.3.2, [F] 415.6.3.4, [F] 415.6.3.4.1, [F] 415.6.3.5.2

Proponent: Philip Brazil, P.E., Reid Middleton, Inc., representing himself

Revise as follows:

[F] 415.6.3.2 Construction. Liquefied petroleum gas-distribution facilities shall be constructed in accordance with Section 415.6.3.3 for separate buildings, Section 415.6.3.4 for attached ~~buildings~~ structures or Section 415.6.3.5 for rooms within buildings.

[F] 415.6.3.4 Attached ~~buildings~~ structures. Where liquefied petroleum gas-distribution facilities are located in an attached structure, the attached perimeter shall not exceed 50 percent of the perimeter of the space enclosed and the facility shall comply with Sections 415.6.3.3 and 415.6.3.4.1. Where the attached perimeter exceeds 50 percent, such facilities shall comply with Section 415.6.3.5.

[F] 415.6.3.4.1 Fire separation. Separation of the attached structures shall be provided by fire barriers having a fire-resistance rating of not less than 1 hour and shall not have openings. Fire barriers between attached structures occupied only for the storage of LP-gas are permitted to have fire door assemblies that comply with Section ~~715~~ 706.7. Such fire barriers shall be designed to withstand a static pressure of at least 100 pounds per square foot (psf) (4788 Pa), except where the building to which the structure is attached is occupied by operations or processes having a similar hazard.

[F] 415.6.3.5 Rooms within buildings. Where liquefied petroleum gas-distribution facilities are located in rooms within buildings, such rooms shall be located in the first story above grade plane and shall have at least one exterior wall with sufficient exposed area to provide explosion venting as required in the *International Fire Code*. The building in which the room is located shall not have a basement or unventilated crawl space and the room shall comply with Sections 415.6.3.5.1 and 415.6.3.5.2.

[F] 415.6.3.5.2 Common construction. Walls and floor/ceiling assemblies common to the room and to the building within which the room is located shall be fire barriers with not less than a 1 hour fire-resistance rating and without openings. Common walls for rooms occupied only for storage of LP-gas are permitted to have ~~opening protectives~~ fire door assemblies complying with Section ~~715~~ 706.7. The walls and ceilings shall be designed to withstand a static pressure of at least 100 psf (4788 Pa).

Exception: Where the building, within which the room is located, is occupied by operations or processes having a similar hazard.

Reason: The purpose for this proposal is to correct several technical flaws in the provisions for liquefied petroleum gas-distribution facilities in attached structures and rooms within buildings. In Section 415.6.3.2 and the title of Section 415.6.3.4, "attached buildings" are changed to "attached structures" for consistency with use of the term "attached structures" in the provisions of Sections 415.6.3.4 and 415.6.3.4.1, and to maintain the distinction between the building and the attached structure that is made in Section 415.6.3.4.1 (last sentence).

In Sections 415.6.3.4.1 and 415.6.3.5.2, the reference to Section 715 to 706.7 to establish that the general limitations in Section 706.7 for protected openings in fire barriers are applicable to fire barriers in liquefied petroleum gas-distribution facilities. Without the change, a code user may conclude that the limitations in liquefied petroleum gas-distribution facilities are less than are generally required for fire barriers.

The Section 415.6.3.5.2, "opening protectives" are changed to "fire door assemblies" for consistency with the same requirement in Section 415.6.3.4.1 for attached structures. Otherwise, fire window assemblies and other forms of opening protection would be permitted.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Modified

Modify the proposal as follows:

[F] 415.6.3.4.1 Fire separation. ~~Separation of the a~~ Attached structures shall be ~~provided~~ separated from the building by fire barriers having a fire-resistance rating of not less than 1 hour and shall not have openings. Fire barriers between attached structures occupied only for the storage of LP-gas are permitted to have fire door assemblies that comply with Section 706.7. Such fire barriers shall be designed to withstand a static

CODE CHANGES RESOURCE COLLECTION – INTERNATIONAL BUILDING CODE

pressure of at least 100 pounds per square foot (psf) (4788 Pa), except where the building to which the structure is attached is occupied by operations or processes having a similar hazard.

(Portions of proposal not shown remain unchanged)

Committee Reason: Based on the proponent-s reason statement. The proposal, with the modification, makes editorial refinements in the style of the code to make the LP-gas facility construction provisions clearer to the code user.

Assembly Action:

None

Final Hearing Results

F232-06/07

AM

2006 INTERNATIONAL PLUMBING CODE

Code Change No: **P24-06/07**

Original Proposal

Table 403.1 (IBC Table [P] 2902.1)

Proponent: Jud Collins, JULYCO

Revise table as follows:

**TABLE 403.1 (IBC Table [P] 2902.1)
MINIMUM NUMBER OF REQUIRED PLUMBING FIXTURES^a
(See Section 403.2 and 403.3)**

NO.	CLASSIFICATION	OCCUPANCY	DESCRIPTION	WATER CLOSET (URINALS SEE SECTION 419.2)		LAVATORIES		BATHTUBS/ SHOWERS	DRINKING FOUNTAIN ^b (SEE SECTION 410.1)	OTHER
				MALE	FEMALE	MALE	FEMALE			
(Portions of table not shown do not change)										

- a. The fixtures shown are based on one fixture being the minimum required for the number of persons indicated or any fraction of the number of persons indicated. The number of occupants shall be determined by the *International Building Code*.
- b. Toilet facilities for employees shall be separate from facilities for inmates or patients.
- c. A single-occupant toilet room with one water closet and one lavatory serving not more than two adjacent patient sleeping units shall be permitted where such room is provided with direct access from each patient room and with provisions for privacy.
- d. The occupant load for seasonal outdoor seating and entertainment areas shall be included when determining the minimum number of facilities required.
- e. The minimum number of required drinking fountains shall comply with Table 403.1 and Chapter 11 of the *International Building Code*.

Reason: This proposed change is to clarify and correlate the IPC with the accessibility requirements of Chapter 11 in the IBC. Fifty percent of drinking fountains are required to be accessible. By accessibility standards, an accessible unit contains two bowls, one high and one low. Therefore, to comply with both the IPC and the IBC requirements for drinking fountains, an occupancy that is required to provide a minimum of one drinking fountain will be required to have a unit that has two bowls, one high and one low.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The reference to the IBC is necessary to prevent the code user from overlooking the accessible drinking fountain requirements in the IBC.

Assembly Action:

None

Final Hearing Results

P24-06/07

AS

Code Change No: **P25-06/07**

Original Proposal

Table 403.1 (IBC Table [P] 2902.1)

Proponent: James Anjam, Arlington County, Virginia, representing Virginia Plumbing and Mechanical Inspectors Association (VPMIA) and the Virginia Building Code Officials Association (VBCOA)

Revise table as follows:

**TABLE 403.1 (IBC Table [P] 2902.1)
MINIMUM NUMBER OF REQUIRED PLUMBING FIXTURES^a
(See Sections 403.2 and 403.3)**

NO.	CLASSIFICATION	OCCUPANCY	DESCRIPTION	WATER CLOSET (URINALS SEE SECTION 419.2)		LAVATORIES		BATHTUBS/ SHOWERS	DRINKING FOUNTAIN (SEE SECTION 410.1)	OTHER
				MALE	FEMALE	MALE	FEMALE			
1	Assembly (see Sections 403.2, 403.4 and 403.4.1)	A-4	Coliseums, arenas, skating rinks, pools and tennis courts for indoor sporting events and activities	1 per 75 for the first 1,500 and 1 per 120 for the remainder exceeding 1,500	1 per 40 for the first 4,500 1520 and 1 per 60 for the remainder exceeding 4500 1520	1 per 200	1 per 150	—	1 per 1,000	1 service sink
		A-5	Stadiums, amusement parks, bleachers and grandstands for outdoor sporting events and activities	1 per 75 for the first 1,500 and 1 per 120 for the remainder exceeding 1,500	1 per 40 for the first 4,500 1520 and 1 per 60 for the remainder exceeding 4500 1520	1 per 200	1 per 150	—	1 per 1,000	1 service sink

(Portions of table not shown do not change)

Reason: In the case of A-4 and A-5 occupancies for female WC's the first calculation step results in a fraction (1500 ÷ 40 = 37.5) which creates confusion on whether to round the number before adding to the next calculation step.

Where fixtures are prescribed by more than one ratio, two calculations are performed, each of which could yield a fractional number. The question then arises of whether to add the fractions together and then round up the sum, or to first round up both fractions and then sum them. Depending on the fractions, this will often change the future count by one. For example, An A-4 occupancy with 2,000 females 1500 ÷ 40 = 37.5 water closets and 500 ÷ 60 = 8.33. This will result in either 46 or 47 water closets depending on how you round up the fractions. To solve this issue, the 1500 boundary is simply adjusted so that the first ratio will yield an even number (38). All of the other first ratios in Table 403.1 already yield even numbers.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The proposed adjustment will cause the application of the first ratio of 1 per 40 to result in an even number, thus eliminating the confusion on how to roundup fractions when application of the first and second ratios both yield fractions.

Assembly Action:

None

Final Hearing Results

P25-06/07

AS

Code Change No: **P28-06/07**

Original Proposal

Sections: 403.1.1 (IBC [P] 2902.1.1)

Proponent: James Anjam, Arlington County, Virginia, representing Virginia Plumbing and Mechanical Inspectors Association (VPMIA) and the Virginia Building Code Officials Association (VBCOA)

Revise as follows:

403.1.1 Unisex toilet and bath fixtures. Fixtures located within unisex toilet and bathing rooms required by Section 1109.2.1 of the *International Building Code* complying with Section 404 are permitted to be ~~included in determining the minimum required number of fixtures for~~ deducted from the number of required fixtures for either the male or female occupants in assembly and mercantile occupancies.

Reason: Currently you can calculate the fixture requirement by using various methods; this can result in different fixture requirements. This proposed change provides a uniform method of calculation for the plumbing fixtures and realigns the sections involving this calculation.

For example, an occupancy requires 5 female water closets and 5 male water closets for a total of 10 water closets. The water closet installed in the unisex toilet room required by the IBC can be deducted from the total for either sex, resulting in 5 water closets for females and 4 water closets for males or vice-versa. The 9 water closets plus the one water closet in the unisex room results in the same total of 10 water closets. If a water closet is deducted from each sex, the total would be 9 water closets which is less than the original requirement of 10. The reference to Section 404 is an unnecessary step since 404 simply references the IBC.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Modified

Modify the proposal as follows:

403.1.1 Unisex toilet and bath fixtures. Fixtures located within unisex toilet and bathing rooms required by Section 1109.2.1 of the *International Building Code* are permitted to be included in ~~deducted from~~ the number of required fixtures for either the male or female occupants in assembly and mercantile occupancies.

Committee Reason: The current code is silent on whether the unisex toilet fixtures can be deducted from the required number of fixtures for either sex or both sexes. By allowing the unisex fixtures to count toward the required number for only one of the sexes, the total number of fixtures required by Table 403.1 is preserved. The modification makes it clear that “deductions” are not lessening the required number of fixtures.

Assembly Action:

None

Final Hearing Results

P28-06/07

AM

Code Change No: P32-06/07

Original Proposal

Sections: 403.3, 403.1.1 (New) [IBC [P] 2902.3, [P] 2902.1.1 (New)]

Proponent: James Anjam, Arlington County, Virginia, representing Virginia Plumbing and Mechanical Inspectors Association (VPMIA) and the Virginia Building Code Officials Association (VBCOA)

1. Delete without substitution:

~~**403.3 Number of occupants of each sex.** The required water closets, lavatories, and showers or bathtubs shall be distributed equally between the sexes based on the percentage of each sex anticipated in the occupant load. The occupant load shall be composed of 50 percent of each sex, unless statistical data approved by the code official indicate a different distribution of the sexes.~~

2. Add new text as follows:

403.1.1 Fixture calculations. To determine the occupant load of each sex, the total occupant load shall be divided in half. To determine the required number of fixtures, the fixture ratio or ratios for each fixture type shall be applied to the occupant load of each sex in accordance with Table 403.1. Fractional numbers resulting from applying the fixture ratios of Table 403.1 shall be rounded up to the next whole number. For calculations involving multiple occupancies, such fractional numbers for each occupancy shall first be summed and then rounded up to the next whole number.

Exception: The total occupant load shall not be required to be divided in half where approved statistical data indicates a distribution of the sexes of other than 50 percent of each sex.

Reason: Currently you can calculate the fixture requirement by using various methods; this can result in different fixture requirements. This proposed change provides a uniform method of calculation for the plumbing fixtures and realigns the sections involving this calculation. Currently, the code is silent on the rounding of fractions.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The proposed text provides clarity in intent by stating a prescriptive method for calculating the fixture count. The current code is silent on the treatment of fractions and provides no guidance for calculations involving multiple occupancies and the resultant multiple fraction counts.

Assembly Action:

None

Final Hearing Results

P32-06/07

AS

Code Change No: P34-06/07

Original Proposal

Sections: 403.5.1 (New) [IBC [P] 2902.5.1 (New)]

Proponent: Robert A. Brubaker, American Restroom Association

Add new text as follows:

403.5.1 Directional signage. Directional signage indicating the route to the nearest public facilities shall be clearly and conspicuously posted in accordance with Section 3107 of the IBC. Such signage shall be located in a major corridor or aisle, near the entrance to the facilities and at a height where a clear line of sight exists for customers and visitors.

Reason: To strengthen the intent of the existing code section 403, Minimum Plumbing Facilities, and in particular section 403.6, Public facilities, which currently reads as follows: Customers, patrons and visitors shall be provided with public toilet facilities in structures and tenant spaces intended for public utilization.

When toilet facilities are locked, or when the only toilet facilities are not located in customers areas, customers, patrons and visitors are sometimes told there are no restrooms or that the only toilet facilities are for the use of 'employees only.' Code mandated directional signs in the customer area will likely prevent such misstatements. If the signs were to be removed, Commercial Code Enforcement Officials would have a clearly visible violation rather than a complaint of not being allowed to use the public facility, a complaint which is more difficult for the Enforcement Officials to investigate and verify.

Bibliography: The American Restroom Association frequently receives requests from people who were not allowed to use toilet facilities in places of public assembly where the adopted IPC code clearly indicated that they should have been allowed to use these facilities. We also work with the media to make the public aware of the provisions of section 403 of the IPC.

The following is from a comprehensive review of the problem that appeared in an major American newspaper

...As it turns out, many U.S. merchants may be unwittingly in violation of plumbing codes when it comes to letting the public use their bathrooms. A growing number of states now include language in their codes spelling out requirements for customer restroom ...

Source: The Wall Street Journal 'Bathroom Backlash Arrives on Main Street ' July 26, 2005

<http://www.startupjournal.com/columnists/enterprise/20050726-bounds.html>

Additional Media

ROCHESTER N.H. ...The city's health and plumbing inspector, ... notified store employees and the supervisor that they were wrong in denying the woman access to the bathroom... the state inspector, agreed, listing a series of state codes dating back to the late 1970s in addition to the 2000 edition of the International Plumbing Code....

Source: 'Woman denied use of public restroom at Rochester thrift store.' Fosters Daily Democrat June 9, 2005

<http://www.fosters.com/apps/pbcs.dll/article?AID=/20050609/NEWS05/106090089/-1/CITIZEN>

Story in a national **sanitation** trade paper,

Haven't we all been there? You're walking around in a busy tourist community. You need to use a restroom. The only available facilities are inside the shops and restaurants. And they all have signs on the front door saying, "No Public Restroom," ...

Source: 'Going Downtown - A non-profit group sees a role for portable restrooms in solving the problem of inadequate sanitary facilities in public gathering places' October 2002 issue of PUMPER Magazine. by Ted J. Rulseh Sr Editor

Voices of real people who contacted the American Restroom Association.

Note: the following anecdotes are provided to illustrate the poignant human element of the problem. They have taken place countrywide and are not limited to only those municipalities that have adopted the IPC.

As an IC patient myself, I was shopping at [deleted reference] about two years ago when I had sudden bladder spasm that left me gasping in pain. I asked the manager if I could use the restroom and she haughtily proclaimed "No." I said, "I have a medical condition and a medic alert card. Would that make a difference?" She said "No" and urged that I walk a block (impossible at the time) to another store to use their public restroom. Funny, I was buying more than \$200 worth of merchandise... and yet that wasn't worth anything in her eyes. So, I raised my voice slightly... said something about recently having surgery. She shook her head... and other customers came to my defense. About five agonizing minutes later, she grudgingly allowed an employee to escort me to their bathroom.

Source: Email: dated Jan 04, 2003 8:10 AM .

I had a very upsetting situation yesterday. I was in a [name deleted] store. It was a stand alone building, not in a mall. It was cold and rainy and I lost my car keys. My husband was on his way to get me when my 3 year old said he needed to go to the potty. The store refused to let us use their facility due to company policy. About 4 minutes later, my child urinated in his pants and on the floor. This was a large store and it is hard for me to believe that they are not legally supposed to have a public facility. This was in Raleigh NC. What is the legality of this situation?

Source: Email dated, Feb 16, 2003 5:46 AM

CODE CHANGES RESOURCE COLLECTION – INTERNATIONAL BUILDING CODE

I had a situation yesterday where I needed to use the restroom badly & the manager of the store wouldn't let me use it. I have ulcerative colitis. So I had to go very bad. I defecated myself. That was the most embarrassing thing to happen to me. So I want to know what steps to take next. Please contact me a.s.a.p so I know what to do about this situation! Thank you.

Source: Email dated Aug 04, 2003 11:18 AM

I was x-mas shopping in a local (removed name) retail store with my 4 year old son recently. While shopping, he told me that he had a bellyache and needed to go (#2) to the bathroom. We walked up to the clerk at the counter and he waited patiently until she was finished assisting another customer. When he asked, she point blank said no to him and pointed to a fast food restaurant down the street. She claimed that it was the store's policy. [deleted text] I am furious to think that a store can be so cruel and uncaring to a child. It's difficult enough for adults to have to "hold it" in a crisis such as that let alone a child who is only 4 years old.

Source: Email dated December 18, 2003 8:54 PM

I read some of the "real people voices" and found myself in the same position as some of those with young children. I too have a young child and was denied the use of their facilities because their safety door did not have a lock on it. I was unclear on what that had to do with the use of the bathroom ...

Source: Web feedback dated 07 Apr 04 01:08:25

I am pregnant and had a sudden emergency to use the bathroom. I was in a [deleted] in Lunenburg, Ma, I explained my situation and was told "no". I even went to the manager and he said that so and so would have a cow, so I couldn't. I put down my basket and left. Can they do this

Source: Web feedback dated 14 Apr 04 08:09:10

Cost Impact: The code change proposal will minimally increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Modified

Modify the proposal as follows:

403.5.1 Directional signage. Directional signage indicating the route to the ~~nearest~~ public facilities shall be ~~clearly and conspicuously~~ posted in accordance with Section 3107 of the IBC. Such signage shall be located in a ~~major~~ corridor or aisle, ~~near~~ at the entrance to the facilities ~~and at a height where a clear line of sight exists~~ for customers and visitors.

Committee Reason: Having required directional signage will strengthen the intent of the code to provide facilities for customers, patrons and visitors. The signage will make it more difficult for owners and employees to tell someone for whom the facilities are required that such facilities do not exist. Absence of the code required signage will present an obvious code violation that the code official can act upon instead of having to act solely on a customer complaint. The modification removes some subjective terms.

Assembly Action:

None

Final Hearing Results

P34-06/07

AM

2006 INTERNATIONAL RESIDENTIAL CODE

Code Change No: **RB33-06/07**

Original Proposal

Sections: R301.1.1, Chapter 43; IBC 2301.2, Chapter 35

THIS PROPOSAL IS ON THE AGENDA OF THE IRC BUILDING/ENERGY AND THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

Proponent: Rob Pickett, Rob Pickett & Associates, LLC, representing ICC IS-LOG Standards Committee

PART I – IRC

1. Revise as follows:

301.1.1 Alternative provisions. As an alternative to the requirements in Section R301.1 the following standards are permitted subject to the limitations of this code and the limitations therein. Where engineered design is used in conjunction with these standards the design shall comply with the *International Building Code*.

1. American Forest & Paper Association (AF&PA), Wood Frame Construction Manual (WFCM).
2. American Iron and Steel Institute (AISI), Standard for Cold-Formed Steel Framing – Prescriptive Method for One- and Two-family Dwellings (COFS-PM).
3. ICC-400.

2. Add standard to Chapter 43 as follows:

International Code Council (ICC)

ICC-400 IS-LOG Standard for the Design and Construction of Log Structures

PART II – IBC

1. Revise as follows:

2301.2 General design requirements. The design of structural elements or systems, constructed partially or wholly of wood or wood-based products, shall be in accordance with one of the following methods:

1. Allowable stress design in accordance with Sections 2304, 2305 and 2306.
2. Load and resistance factor design in accordance with Sections 2304, 2305 and 2307.
3. Conventional light-frame construction in accordance with Sections 2304 and 2308.

Exception: Buildings designed in accordance with the provisions of the AF&PA WFCM shall be deemed to meet the requirements of the provisions of Section 2308.

4. The design and construction of log structures shall be in accordance with the provisions of the ICC-400.

2. Add standard to Chapter 35 as follows:

International Code Council (ICC)

ICC-400 IS-LOG Standard for the Design and Construction of Log Structures

Reason: Currently the IBC and IRC do not provide any guidelines or list a standard for the construction of log structures. The ICC-400 IS-LOG Standard for the Design and Construction of Log Structures represents those industry standards and guidelines.

Cost Impact: The cost of construction will be that incurred to build properly with quality products, connectors and methods as compared to the utilization of any material with no proper methodology used in the structures development.

Analysis: The proposed standard has not been reviewed for compliance with Section 3.6 of the ICC Code Development process. Staff will review it and post the results at the ICC website prior to the code change hearings.

Public Hearing Results

PART I — IRC

Committee Action:

Approved as Submitted

Committee Reason: This new standard, ICC-400 Standard for the Design and Construction of Log Structures, gives the code official an important tool for inspection and understanding log construction.

Assembly Action:

None

PART II – IBC STRUCTURAL

Committee Action:

Disapproved

Committee Reason: The committee's disapproval is based on the status of the proposed referenced standard. If the standard is completed the proponent is encouraged to submit a public comment on this proposal. The standard was developed under the ANSI process and is desperately needed.

Assembly Action:

None

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted for Part II.

Public Comment:

Rob Pickett, Chair/Robert Savignau, Vice Chair, ICC IS-LOG Standards Committee request Approval as Submitted for Part II.

Commenter's Reason: At the time of the Public Hearings in Orlando, Florida the IBC Structural committee and the IRC B/E committee was furnished with draft copies of the completed log standard. The document had not been approved by ANSI for publication that time but the language was complete. Since that time the document has been submitted to ANSI and has received approval for publication as an American National Standard. The ICC Standard for Design and Construction of Log Structures is now published and available for purchase. We urge the membership to follow the actions of the IRC B/E committee and support the reference of this important tool in the IBC.

Final Hearing Results

RB33-06/07, Part I	AS
RB33-06/07, Part II	AS

Code Change No: **RB314-06/07**

Original Proposal

Appendix G105.2; IBC 3109.4.1.7

Proponent: Gene Boecker, Code Consultants, Inc.

THIS PROPOSAL IS ON THE AGENDA OF THE IRC BUILDING/ENERGY AND THE IBC GENERAL CODE DEVELOPMENT COMMITTEES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IRC

Revise as follows:

AG105.2 Outdoor swimming pool. An outdoor swimming pool, including an in-ground, above-ground or on-ground pool, hot tub or spa shall be surrounded by a barrier which shall comply with the following:

1. The top of the barrier shall be at least 48 inches (1219 mm) above grade measured on the side of the barrier which faces away from the swimming pool. The maximum vertical clearance between grade and the bottom of the barrier shall be 2 inches (51 mm) measured on the side of the barrier which faces away from the swimming pool. Where the top of the pool structure is above grade, such as an above-ground pool, the barrier may be at ground level, such as the pool structure, or mounted on top of the pool structure. Where the barrier is mounted on top of the pool structure, the maximum vertical clearance between the top of the pool structure and the bottom of the barrier shall be 4 inches (102 mm).
2. Openings in the barrier shall not allow passage of a 4-inch-diameter (102 mm) sphere.
3. Solid barriers which do not have openings, such as a masonry or stone wall, shall not contain indentations or protrusions except for normal construction tolerances and tooled masonry joints.
4. Where the barrier is composed of horizontal and vertical members and the distance between the tops of the horizontal members is less than 45 inches (1143 mm), the horizontal members shall be located on the swimming pool side of the fence. Spacing between vertical members shall not exceed 13/4 inches (44 mm) in width. Where there are decorative cutouts within vertical members, spacing within the cutouts shall not exceed 13/4 inches (44 mm) in width.
5. Where the barrier is composed of horizontal and vertical members and the distance between the tops of the horizontal members is 45 inches (1143 mm) or more, spacing between vertical members shall not exceed 4 inches (102 mm). Where there are decorative cutouts within vertical members, spacing within the cutouts shall not exceed 13/4 inches (44 mm) in width.
6. Maximum mesh size for chain link fences shall be a 2 1/4-inch (57 mm) square unless the fence has slats fastened at the top or the bottom which reduce the openings to not more than 13/4 inches (44 mm).
7. Where the barrier is composed of diagonal members, such as a lattice fence, the maximum opening formed by the diagonal members shall not be more than 13/4 inches (44 mm).
8. Access doors or gates shall comply with the requirements of Section AG105.2, Items 1 through 7, and shall be equipped to accommodate a locking device. Pedestrian access doors or gates shall open outward away from the pool and shall be self-closing and have a self-latching device. Doors or gates other than pedestrian access doors or gates shall have a self-latching device. Where the release mechanism of the self-latching device is located less than 54 inches (1372 mm) from the bottom of the door or gate, the release mechanism and openings shall comply with the following:
 - 8.1. The release mechanism shall be located on the pool side of the door or gate at least 3 inches (76 mm) below the top of the door or gate; and
 - 8.2. The door or gate and barrier shall have no opening larger than 1/2 inch (13 mm) within 18 inches (457 mm) of the release mechanism.
9. Where a wall of a dwelling serves as part of the barrier, one of the following conditions shall be met:
 - 9.1. The pool shall be equipped with a powered safety cover in compliance with ASTM F 1346; or
 - 9.2. Doors with direct access to the pool through that wall shall be equipped with an alarm which produces an audible warning when the door and/or its screen, if present, are opened. The alarm shall be listed in accordance with UL 2017. The audible alarm shall activate within 7 seconds and sound continuously for a minimum of 30 seconds after the door and/or its screen, if present, are opened and be capable of being heard throughout the house during normal household activities.

The alarm shall automatically reset under all conditions. The alarm system shall be equipped with a manual means, such as touch pad or switch, to temporarily deactivate the alarm for a single opening. Deactivation shall last for not more than 15 seconds. The deactivation switch(es) shall be located at least 54 inches (1372 mm) above the threshold of the door; or

- 9.3. Other means of protection, such as self-closing doors with self-latching devices, which are approved by the governing body, shall be acceptable so long as the degree of protection afforded is not less than the protection afforded by Item 9.1 or 9.2 described above.
- 10. Where an above-ground pool structure is used as a barrier or where the barrier is mounted on top of the pool structure, and the means of access is a ladder or steps:
 - 10.1. The ladder or steps shall be capable of being secured, locked or removed to prevent access; or
 - 10.2. The ladder or steps shall be surrounded by a barrier which meets the requirements of Section AG105.2, Items 1 through 9. When the ladder or steps are secured, locked or removed, any opening created shall not allow the passage of a 4-inch-diameter (102 mm) sphere.

PART II – IBC

Revise as follows:

3109.4.1.7 Gates. Access doors or gates shall comply with the requirements of Sections 3109.4.1.1 through 3109.4.1.6 and shall be equipped to accommodate a locking device. Pedestrian access doors or gates shall open outward away from the pool and shall be self-closing and have a self-latching device. Doors or gates other than pedestrian access door or gates shall have a self-latching device. Release mechanisms shall be in accordance with Sections 1008.1.8 and 1109.13. Where the release mechanism of the self-latching device is located less than 54 inches (1372 mm) from the bottom of the door or gate, the release mechanism shall be located on the pool side of the door or gate at least 3 inches (76 mm) below the top of the door or gate, and the door or gate and barrier shall have no opening greater than 0.5 inch (12.7 mm) within 18 inches (457 mm) of the release mechanism.

Reason: Coordination among requirements for doors and gates that provide protection of swimming pools.

Commonly, in the case where a pool is accessed from an interior space, a door is used instead of a gate. This change adds a cross correlation that acknowledges that the pool access can be other than a gate but that the hardware must still be at 54 inches. Pools are required to be protected by enclosures. Clarifying the need to install hardware at the proper height for its function is necessary in the code.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

PART I - IRC

Committee Action:

Disapproved

Committee Reason: Item 8 would be overly restrictive on an existing building for sliding glass doors or in swinging doors and could require extensive structural modification when an alarm device might suffice.

Assembly Action:

None

PART II - IBC

Committee Action:

Approved as Submitted

Committee Reason: This proposal was approved based upon the fact that doors instead of or in addition to gates are often used in conjunction with barriers for pools.

Assembly Action:

None

Final Hearing Results

RB314-06/07, Part I	D
RB314-06/07, Part II	AS

Code Change No: **RB315-06/07**

Original Proposal

Appendix G105.2; IBC 3109.4.1.8

Proponent: Bob Eugene, Underwriters Laboratories, Inc.

THIS PROPOSAL IS ON THE AGENDA OF THE IRC BUILDING/ENERGY AND THE IBC GENERAL CODE DEVELOPMENT COMMITTEES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IRC

Revise as follows:

AG105.2 Outdoor swimming pool. An outdoor swimming pool, including an in-ground, above-ground or on-ground pool, hot tub or spa shall be surrounded by a barrier which shall comply with the following:

1. The top of the barrier shall be at least 48 inches (1219 mm) above grade measured on the side of the barrier which faces away from the swimming pool. The maximum vertical clearance between grade and the bottom of the barrier shall be 2 inches (51 mm) measured on the side of the barrier which faces away from the swimming pool. Where the top of the pool structure is above grade, such as an above-ground pool, the barrier may be at ground level, such as the pool structure, or mounted on top of the pool structure. Where the barrier is mounted on top of the pool structure, the maximum vertical clearance between the top of the pool structure and the bottom of the barrier shall be 4 inches (102 mm).
2. Openings in the barrier shall not allow passage of a 4-inch-diameter (102 mm) sphere.
3. Solid barriers which do not have openings, such as a masonry or stone wall, shall not contain indentations or protrusions except for normal construction tolerances and tooled masonry joints.
4. Where the barrier is composed of horizontal and vertical members and the distance between the tops of the horizontal members is less than 45 inches (1143 mm), the horizontal members shall be located on the swimming pool side of the fence. Spacing between vertical members shall not exceed 13/4 inches (44 mm) in width. Where there are decorative cutouts within vertical members, spacing within the cutouts shall not exceed 13/4 inches (44 mm) in width.
5. Where the barrier is composed of horizontal and vertical members and the distance between the tops of the horizontal members is 45 inches (1143 mm) or more, spacing between vertical members shall not exceed 4 inches (102 mm). Where there are decorative cutouts within vertical members, spacing within the cutouts shall not exceed 13/4 inches (44 mm) in width.
6. Maximum mesh size for chain link fences shall be a 2 1/4-inch (57 mm) square unless the fence has slats fastened at the top or the bottom which reduce the openings to not more than 13/4 inches (44 mm).
7. Where the barrier is composed of diagonal members, such as a lattice fence, the maximum opening formed by the diagonal members shall not be more than 13/4 inches (44 mm).
8. Access gates shall comply with the requirements of Section AG105.2, Items 1 through 7, and shall be equipped to accommodate a locking device. Pedestrian access gates shall open outward away from the pool and shall be self-closing and have a self-latching device. Gates other than pedestrian access gates shall have a self-latching device. Where the release mechanism of the self-latching device is located less than 54 inches (1372 mm) from the bottom of the gate, the release mechanism and openings shall comply with the following:
 - 8.1. The release mechanism shall be located on the pool side of the gate at least 3 inches (76 mm) below the top of the gate; and
 - 8.2. The gate and barrier shall have no opening larger than 1/2 inch (13 mm) within 18 inches (457 mm) of the release mechanism.
9. Where a wall of a dwelling serves as part of the barrier, one of the following conditions shall be met:
 - 9.1. The pool shall be equipped with a powered safety cover in compliance with ASTM F 1346; or
 - 9.2. Doors with direct access to the pool through that wall shall be equipped with an alarm which produces an audible warning when the door and/or its screen, if present, are opened. The alarm shall be listed and labeled in accordance with UL 2017. ~~The audible alarm shall activate within 7 seconds and sound continuously for a minimum of 30 seconds after the door and/or its screen, if present, are opened and~~

~~be capable of being heard throughout the house during normal household activities. The alarm shall automatically reset under all conditions. The alarm system shall be equipped with a manual means, such as touch pad or switch, to temporarily deactivate the alarm for a single opening. Deactivation shall last for not more than 15 seconds. The deactivation switch(es) shall be located at least 54 inches (1372 mm) above the threshold of the door.~~

~~9.3. Other means of protection, such as self-closing doors with self-latching devices, which are approved by the governing body, shall be acceptable so long as the degree of protection afforded is not less than the protection afforded by Item 9.1 or 9.2 described above.~~

10. Where an above-ground pool structure is used as a barrier or where the barrier is mounted on top of the pool structure and the means of access is a ladder or steps:
 - 10.1. The ladder or steps shall be capable of being secured, locked or removed to prevent access; or
 - 10.2. The ladder or steps shall be surrounded by a barrier which meets the requirements of Section AG105.2, Items 1 through 9. When the ladder or steps are secured, locked or removed, any opening created shall not allow the passage of a 4-inch-diameter (102 mm) sphere.

PART II – IBC

Revise as follows:

3109.4.1.8 Dwelling wall as a barrier. Where a wall of a dwelling serves as part of the barrier, one of the following shall apply:

1. Doors with direct access to the pool through that wall shall be equipped with an alarm that produces an audible warning when the door and/or its screen, if present, are opened. The alarm shall be listed and labeled in accordance with UL 2017. ~~The audible alarm shall activate within 7 seconds and sound continuously for a minimum of 30 seconds after the door and/or its screen, if present, are opened and be capable of being heard throughout the house during normal household activities. The alarm shall automatically reset under all conditions. The alarm shall be equipped with a manual means, such as touchpad or switch, to temporarily deactivate the alarm for a single opening. Such deactivation shall last for not more than 15 seconds.~~ In dwellings not required to be Accessible, Type A or Type B units, the deactivation switch shall be located 54 inches (1372 mm) or more above the threshold of the door. In dwellings required to be Accessible, Type A or Type B units, the deactivation switch(es) shall be located at 54 inches (1372 mm) maximum and 48 inches minimum above the threshold of the door.
2. The pool shall be equipped with a power safety cover that complies with ASTM F 1346.
3. ~~Other means of protection, such as self-closing doors with self-latching devices, which are approved by the administrative authority, shall be accepted so long as the degree of protection afforded is not less than the protection afforded by Section 3109.4.1.8, Item 1 or 2.~~

Reason: To delete unnecessary text.

UL 2017 is the ANSI standard that addresses “pool alarms”, also known as residential water-hazard entrance alarm equipment. UL 2017 establishes a definitive performance test and audible level criteria for the alarm. The third option is already available through alternate materials and methods in Section 104.11.

UL 2017 covers Residential Water Hazard entrance alarms. Residential Water Hazard entrance alarms are devices or systems intended to be installed on gates, doors, or access barriers surrounding residential swimming pools, spas, or hot tubs for the purpose of sounding an audible alarm due to unauthorized entry into these areas. UL 2017 includes the requirement identified in the code as well as an operation test, an audibility test and a static discharge test. There are several pool alarms that are currently listed and available in the marketplace. The third option is already available through alternate materials and methods in Section 104.11.

Bibliography: UL 2017

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

PART I C IRC

Committee Action:

Approved as Modified

Modify the proposal as follows:

9.3. Other means of protection, such as self-closing doors with self-latching devices, which are approved by the governing body, shall be acceptable so long as the degree of protection afforded is not less than the protection afforded by Item 9.1 or 9.2 described above.

(Portions of proposal not shown remain unchanged)

Committee Reason: This change removes the 7 second delay since it is now covered in UL 2017. The modification retains subsection 9.3 in order to allow an alternate and to be consistent with the IBC General action on Part II.

Assembly Action: **None**

PART II C IBC

Committee Action: **Approved as Modified**

Modify the proposal as follows:

- 3. Other means of protection, such as self-closing doors with self-latching devices, which are approved by the administrative authority, shall be accepted so long as the degree of protection afforded is not less than the protection afforded by Section 3109.4.1.8, Item 1 or 2.

(Portions of proposal not shown remain unchanged)

Committee Reason: The committee supported deleting the redundant language within the code which is currently contained in UL 2017. The proposal was modified to retain item 3 as it provides a specific method for compliance instead of relying on Section 104.11 for this allowance.

Assembly Action: **None**

Final Hearing Results

RB315-06/07, Part I	AM
RB315-06/07, Part II	AM

2007/2008 DOCUMENTATION



IBC – FIRE SAFETY

Code Change No: **FS1-07/08**

Original Proposal

Sections: 702.1, 704.8.2, 706.7

Proponent: Philip Brazil, PE, Reid Middleton, Inc., representing himself

Revise as follows:

SECTION 702 DEFINITIONS

702.1 Definitions. The following words and terms shall, for the purposes of this chapter, and as used elsewhere in this code, have the meanings shown herein.

FIRE PROTECTION RATING. The period of time that an opening protective assembly will maintain the ability to confine a fire as determined by tests prescribed in Section 715. Ratings are stated in hours or minutes.

704.8.2 (Supp) Protected openings. Where openings are required to be protected, fire doors and fire shutters shall comply with Section 715.4 and fire window assemblies shall comply with Section 715.5.

Exception: Opening protective assemblies are not required where the building is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 and the exterior openings are protected by a water curtain using automatic sprinklers approved for that use.

706.7(Supp) Openings. Openings in a fire barrier shall be protected in accordance with Section 715. Openings shall be limited to a maximum aggregate width of 25 percent of the length of the wall, and the maximum area of any single opening shall not exceed 156 square feet (15 m²). Openings in exit enclosures and exit passageways shall also comply with Sections 1020.1.1 and 1021.4, respectively.

Exceptions:

1. Openings shall not be limited to 156 square feet (15 m²) where adjoining floor areas are equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.
2. Openings shall not be limited to 156 square feet (15 m²) or an aggregate width of 25 percent of the length of the wall where the opening protective is a fire door serving an exit enclosure.
3. Openings shall not be limited to 156 square feet (15 m²) or an aggregate width of 25 percent of the length of the wall where the opening protective assembly has been tested in accordance with ASTM E 119 or UL 263 and has a minimum fire-resistance rating not less than the fire-resistance rating of the wall.
4. Fire window assemblies permitted in atrium separation walls shall not be limited to a maximum aggregate width of 25 percent of length of the wall.

Reason: The changes are proposed for consistency with the use of "opening protective" elsewhere in the 2006 IBC and 2007 IBC Supplement (approximately 40 locations). Those noted above are the only instances of "opening protective assembly" in the 2006 IBC or 2007 IBC Supplement.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The committee agreed that this change was necessary for consistency with the use of “opening protective” elsewhere in the 2006 IBC and 2007 IBC Supplement.

Assembly Action:

None

Final Hearing Results

FS1-07/08

AS

Code Change No: **FS2-07/08**

Original Proposal

Sections: [F] 403.2, [F] 415.6.3.5.2, 508.2.5.2, 702.1, 704.9.1, 704.11, 706.5, 707.1, 707.2, 708.4, 709.4, 711.3.1, 711.3.2, 711.6, 712.4, 712.4.1, 712.4.1.2, 713.1.173.4, 714.3, 716.6 (IMC [B] 607.6), 716.6.1 (IMC [B] 607.6.1), 716.6.2 (IMC [B] 607.6.2), 721.6.1, Table 721.6.2(1), [F] 903.2, [F] 903.3.1.1.1, 1207.1, 1207.2, 1207.3, 1502.1, 3410.6.3.2 (IEBC 1301.6.3.2); IFC 703.3, 914.3.1, 1504.3.2.5

Proponent: Philip Brazil, PE, Reid Middleton, Inc., representing himself

THESE PROPOSALS ARE ON THE AGENDA OF THE IBC FIRE SAFETY, THE IBC STRUCTURAL AND THE IFC CODE DEVELOPMENT COMMITTEES AS 3 SEPARATE CODE CHANGES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES

PART I – IBC FIRE SAFETY

1. Revise as follows:

508.2.5.2 (Supp) Nonfire-resistance rated separation and protection. Where Table 508.2.5 permits an automatic fire extinguishing system without a fire barrier, the incidental accessory occupancies shall be separated from the remainder of the building by construction capable of resisting the passage of smoke. The walls shall extend from the top of the foundation or ~~floor/ceiling floor~~ assembly below to the underside of the ceiling that is a component of a fire-resistance-rated floor/ceiling floor assembly above or ~~fire-resistance-rated roof/ceiling roof~~ assembly above or to the underside of the floor or roof sheathing, deck or slab above. Doors shall be self- or automatic closing upon detection of smoke in accordance with Section 715.4.7.3. Doors shall not have air transfer openings and shall not be undercut in excess of the clearance permitted in accordance with NFPA 80.

SECTION 702 DEFINITIONS

CEILING RADIATION DAMPER. A listed device installed in a ceiling membrane of a fire-resistance-rated ~~floor/ceiling floor assembly~~ or ~~roof/ceiling roof~~ assembly to limit automatically the radiative heat transfer through an air inlet/outlet opening.

DRAFTSTOP. A material, device or construction installed to restrict the movement of air within open spaces of concealed areas of building components such as crawl spaces, ~~floor/ceiling floor~~ assemblies, ~~roof/ceiling roof~~ assemblies and attics.

704.9.1 (Supp) Voids. The void created at the intersection of a ~~floor/ceiling floor~~ assembly and an exterior curtain wall assembly shall be protected in accordance with Section 713.4.

704.11 Parapets. Parapets shall be provided on exterior walls of buildings.

Exceptions: A parapet need not be provided on an exterior wall where any of the following conditions exist:

1. The wall is not required to be fire-resistance rated in accordance with Table 602 because of fire separation distance.
2. The building has an area of not more than 1,000 square feet (93 m²) on any floor.
3. Walls that terminate at roofs of not less than 2-hour fire-resistance-rated construction or where the roof, including the deck or slab and supporting construction, is constructed entirely of noncombustible materials.
4. One-hour fire-resistance-rated exterior walls that terminate at the underside of the roof sheathing, deck or slab, provided:
 - 4.1. Where the ~~roof/ceiling~~ roof framing elements are parallel to the walls, such framing and elements supporting such framing shall not be of less than 1-hour fire-resistance-rated construction for a width of 4 feet (1220 mm) for Groups R and U and 10 feet (3048 mm) for other occupancies, measured from the interior side of the wall.
 - 4.2. Where ~~roof/ceiling~~ roof framing elements are not parallel to the wall, the entire span of such framing and elements supporting such framing shall not be of less than 1-hour fire-resistance-rated construction.
 - 4.3. Openings in the roof shall not be located within 5 feet (1524 mm) of the 1-hour fire-resistance-rated exterior wall for Groups R and U and 10 feet (3048 mm) for other occupancies, measured from the interior side of the wall.
 - 4.4. The entire building shall be provided with not less than a Class B roof covering.
5. In Groups R-2 and R-3 where the entire building is provided with a Class C roof covering, the exterior wall shall be permitted to terminate at the underside of the roof sheathing or deck in Type III, IV and V construction, provided:
 - 5.1. The roof sheathing or deck is constructed of approved noncombustible materials or of fire-retardant-treated wood for a distance of 4 feet (1220 mm); or
 - 5.2. The roof is protected with 0.625-inch (16 mm) Type X gypsum board directly beneath the underside of the roof sheathing or deck, supported by a minimum of nominal 2-inch (51 mm) ledgers attached to the sides of the roof framing members for a minimum distance of 4 feet (1220 mm).
6. Where the wall is permitted to have at least 25 percent of the exterior wall areas containing unprotected openings based on fire separation distance as determined in accordance with Section 704.8.

706.5 (Supp) Continuity. Fire barriers shall extend from the top of the ~~floor/ceiling~~ floor assembly below to the underside of the floor or roof sheathing, slab or deck above and shall be securely attached thereto. Such fire barriers shall be continuous through concealed spaces, such as the space above a suspended ceiling. The supporting construction for a fire barrier shall be protected to afford the required fire-resistance rating of the fire barrier supported, except for 1-hour fire barriers required by Table 508.2 in buildings of Type IIB, IIIB and VB construction. Hollow vertical spaces within a fire barrier shall be fireblocked in accordance with Section 717.2 at every floor level.

Exceptions:

1. The maximum required fire-resistance rating for assemblies supporting fire barriers separating tank storage as provided for in Section 415.6.2.1 shall be 2 hours, but not less than required by Table 601 for the building construction type.
2. Shaft enclosures shall be permitted to terminate at a top enclosure complying with Section 707.12.

707.1 General. The provisions of this section shall apply to vertical shafts where such shafts are required to protect openings and penetrations through ~~floor/ceiling~~ floor and ~~roof/ceiling~~ roof assemblies. Shaft enclosures shall be constructed as fire barriers in accordance with Section 706 or horizontal assemblies in accordance with Section 711, or both.

707.2 Shaft enclosure required. Openings through a ~~floor/ceiling~~ floor assembly shall be protected by a shaft enclosure complying with this section.

Exceptions:

1. A shaft enclosure is not required for openings totally within an individual residential dwelling unit and connecting four stories or less.
2. A shaft enclosure is not required in a building equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 for an escalator opening or stairway that is not a portion of the means of egress protected according to Item 2.1 or 2.2:
 - 2.1. Where the area of the floor opening between stories does not exceed twice the horizontal projected area of the escalator or stairway and the opening is protected by a draft curtain and closely spaced sprinklers in accordance with NFPA 13. In other than Groups B and M, this application is limited to openings that do not connect more than four stories.

- 2.2. Where the opening is protected by approved power-operated automatic shutters at every penetrated floor. The shutters shall be of noncombustible construction and have a fire-resistance rating of not less than 1.5 hours. The shutter shall be so constructed as to close immediately upon the actuation of a smoke detector installed in accordance with Section 907.11 and shall completely shut off the well opening. Escalators shall cease operation when the shutter begins to close. The shutter shall operate at a speed of not more than 30 feet per minute (152.4 mm/s) and shall be equipped with a sensitive leading edge to arrest its progress where in contact with any obstacle, and to continue its progress on release there from.
3. A shaft enclosure is not required for penetrations by pipe, tube, conduit, wire, cable and vents protected in accordance with Section 712.4.
4. A shaft enclosure is not required for penetrations by ducts protected in accordance with Section 712.4. Grease ducts shall be protected in accordance with the *International Mechanical Code*.
5. In other than Group H occupancies, a shaft enclosure is not required for floor openings complying with the provisions for atriums in Section 404.
6. A shaft enclosure is not required for approved masonry chimneys where annular space protection is provided at each floor level in accordance with Section 717.2.5.
7. In other than Groups I-2 and I-3, a shaft enclosure is not required for a floor opening or an air transfer opening that complies with the following:
 - 7.1. Does not connect more than two stories.
 - 7.2. Is not part of the required means of egress system, except as permitted in Section 1020.1.
 - 7.3. Is not concealed within the building construction.
 - 7.4. Is not open to a corridor in Group I and R occupancies.
 - 7.5. Is not open to a corridor on nonsprinklered floors in any occupancy.
 - 7.6. Is separated from floor openings and air transfer openings serving other floors by construction conforming to required shaft enclosures.
 - 7.7. Is limited to the same smoke compartment.
8. A shaft enclosure is not required for automobile ramps in open and enclosed parking garages constructed in accordance with Sections 406.3 and 406.4, respectively.
9. A shaft enclosure is not required for floor openings between a mezzanine and the floor below.
10. A shaft enclosure is not required for joints protected by a fire-resistant joint system in accordance with Section 713.
11. A shaft enclosure shall not be required for floor openings created by unenclosed stairs or ramps in accordance with Exception 8 or 9 in Section 1020.1.
12. Floor openings protected by floor fire doors in accordance with Section 711.8.
13. Where permitted by other sections of this code.
14. Elevators in open parking garages that serve only the parking garage are not required to be enclosed.

708.4 (Supp) Continuity. Fire partitions shall extend from the top of the foundation or ~~floor/ceiling~~ floor assembly below to the underside of the floor or roof sheathing, slab or deck above or to the underside of the ceiling that is a component of a fire-resistance-rated floor/ceiling floor assembly or roof/ceiling roof assembly above, and shall be securely attached thereto. If the partitions are not continuous to the sheathing, deck or slab, and where constructed of combustible construction, the space between the ceiling and the sheathing, deck or slab above shall be fireblocked or draftstopped in accordance with Sections 717.2 and 717.3 at the partition line. The supporting construction shall be protected to afford the required fire-resistance rating of the wall supported, except for walls separating tenant spaces in covered mall buildings, walls separating dwelling units, sleeping units and corridor walls, in buildings of Types IIB, IIIB, and VB construction.

Exceptions:

1. The wall need not be extended into the crawl space below where the floor above the crawl space has a minimum 1-hour fire-resistance rating.
2. Where the room-side fire-resistance-rated membrane of the corridor is carried through to the underside of the floor or roof sheathing, deck or slab of a fire-resistance-rated floor assembly or roof assembly above, the ceiling of the corridor shall be permitted to be protected by the use of ceiling materials as required for a 1-hour fire-resistance-rated floor or roof system.
3. Where the corridor ceiling is constructed as required for the corridor walls, the walls shall be permitted to terminate at the upper membrane of such ceiling assembly.
4. The fire partition separating tenant spaces in a covered mall building, complying with Section 402.7.2, are not required to extend beyond the underside of a ceiling that is not part of a fire-resistance-rated assembly. A wall is not required in attic or ceiling spaces above tenant separation walls.

5. Fireblocking or draftstopping is not required at the partition line in Group R-2 buildings that do not exceed four stories above grade plane, provided the attic space is subdivided by draftstopping into areas not exceeding 3,000 square feet (279 m²) or above every two dwelling units, whichever is smaller.
6. Fireblocking or draftstopping is not required at the partition line in buildings equipped with an automatic sprinkler system installed throughout in accordance with Section 903.3.1.1 or 903.3.1.2, provided that automatic sprinklers are installed in combustible floor/ceiling and roof/ceiling spaces.

709.4 Continuity. Smoke barriers shall form an effective membrane continuous from outside wall to outside wall and from the top of the foundation or ~~floor/ceiling~~ floor assembly below to the underside of the floor or roof sheathing, deck or slab above, including continuity through concealed spaces, such as those found above suspended ceilings, and interstitial structural and mechanical spaces. The supporting construction shall be protected to afford the required fire-resistance rating of the wall or floor supported in buildings of other than Type IIB, IIIB or VB construction.

Exception: Smoke-barrier walls are not required in interstitial spaces where such spaces are designed and constructed with ceilings that provide resistance to the passage of fire and smoke equivalent to that provided by the smoke-barrier walls.

711.3.1 Ceiling panels. Where the weight of lay-in ceiling panels, ~~used as part~~ that are components of fire-resistance-rated ~~floor/ceiling~~ floor assemblies or ~~roof/ceiling~~ roof assemblies, is not adequate to resist an upward force of 1 lb/ft.2 (48 Pa), wire or other approved devices shall be installed above the panels to prevent vertical displacement under such upward force.

711.3.2 (Supp) Access doors. Access doors shall be permitted in ceilings that are components of fire-resistance-rated ~~floor/ceiling~~ floor assemblies and ~~roof/ceiling~~ roof assemblies provided such doors are tested in accordance with ASTM E 119 or UL 263 as horizontal assemblies and labeled by an approved agency for such purpose.

711.6 Joints. Joints made in or between fire-resistance-rated horizontal assemblies shall comply with Section 713. The void created at the intersection of a ~~floor/ceiling~~ floor assembly and an exterior curtain wall assembly shall be protected in accordance with Section 713.4.

712.4 (Supp) Horizontal assemblies. Penetrations of a floor, ~~floor/ceiling~~ assembly or the ceiling membrane that is a component of a ~~roof/ceiling~~ roof assembly not required to be enclosed in a shaft by Section 707.2 shall be protected in accordance with Sections 712.4.1 through 712.4.4.

712.4.1 (Supp) Fire-resistance rated assemblies. Penetrations of the fire-resistance rated floor, ~~floor/ceiling~~ assembly or the ceiling membrane that is a component of a ~~roof/ceiling~~ fire-resistance-rated roof assembly shall comply with Sections 712.4.1.1 through 714.4.1.5. Penetrations in horizontal smoke barriers shall also comply with 712.5.

712.4.1.2 (Supp) Membrane penetrations. Penetrations of membranes that are ~~part~~ a component of a fire-resistance-rated horizontal assembly shall comply with Section 712.4.1.1.1 or 712.4.1.1.2. Where ~~floor/ceiling~~ floor assemblies are required to have a fire-resistance rating, recessed fixtures shall be installed such that the required fire resistance will not be reduced.

Exceptions:

1. Membrane penetrations by steel, ferrous or copper conduits, pipes, tubes or vents, or concrete or masonry items where the annular space is protected either in accordance with Section 712.4.1.1 or to prevent the free passage of flame and the products of combustion. The aggregate area of the openings through the membrane shall not exceed 100 square inches (64 500 mm²) in any 100 square feet (9.3m²) of ceiling area in assemblies tested without penetrations.
2. Ceiling membrane penetrations of maximum 2-hour fire-resistance-rated horizontal assemblies by steel electrical boxes that do not exceed 16 square inches (10 323 mm²) in area, provided the aggregate area of such penetrations does not exceed 100 square inches (44 500 mm²) in any 100 square feet (9.29m²) of ceiling area, and the annular space between the ceiling membrane and the box does not exceed 1/8 inch (3.12 mm).
3. Membrane penetrations by electrical boxes of any size or type, which have been listed as part of an opening protective material system for use in horizontal fire-resistance-rated assemblies and are installed in accordance with the instructions included in the listing.

4. Membrane penetrations by listed electrical boxes of any material, provided such boxes have been tested for use in fire-resistance-rated assemblies and are installed in accordance with the instructions included in the listing. The annular space between the ceiling membrane and the box shall not exceed 1/8 inch (3.1 mm) unless listed otherwise.
5. The annular space created by the penetration of a fire sprinkler, provided it is covered by a metal eschutcheon plate.

713.1 (Supp) General. Joints installed in or between fire-resistance-rated walls, floor ~~or floor/ceiling~~ assemblies and roofs ~~or roof/ceiling~~ assemblies shall be protected by an approved fire-resistant joint system designed to resist the passage of fire for a time period not less than the required fire-resistance rating of the wall, floor or roof in or between which it is installed. Fire-resistant joint systems shall be tested in accordance with Section 713.3. The void created at the intersection of a ~~floor/ceiling~~ floor assembly and an exterior curtain wall assembly shall be protected in accordance with Section 713.4.

Exception: Fire-resistant joint systems shall not be required for joints in all of the following locations:

1. Floors within a single dwelling unit.
2. Floors where the joint is protected by a shaft enclosure in accordance with Section 707.
3. Floors within atriums where the space adjacent to the atrium is included in the volume of the atrium for smoke control purposes.
4. Floors within malls.
5. Floors within open parking structures.
6. Mezzanine floors.
7. Walls that are permitted to have unprotected openings.
8. Roofs where openings are permitted.
9. Control joints not exceeding a maximum width of 0.625 inch (15.9 mm) and tested in accordance with ASTM E 119 or UL 263.

713.4 Exterior curtain wall/floor intersection. Where fire resistance-rated floor ~~or floor/ceiling~~ assemblies are required, voids created at the intersection of the exterior curtain wall assemblies and such floor assemblies shall be sealed with an approved material or system to prevent the interior spread of fire. Such material or systems shall be securely installed and capable of preventing the passage of flame and hot gases sufficient to ignite cotton waste where subjected either to ASTM E 119 or UL 263 time-temperature fire conditions under a minimum positive pressure differential of 0.01 inch (0.254 mm) of water column (2.5 Pa) or installed as tested in accordance with ASTM E 2307 for the time period at least equal to the fire-resistance rating of the floor assembly. Height and fire-resistance requirements for curtain wall spandrels shall comply with Section 704.9.

714.4 (Supp) Column protection. Where columns are required to be fire-resistance rated, the entire column, including its connections to beams or girders, shall be provided individual encasement protection on all sides for the full column length. Where the column extends through a ceiling, the fire resistance rating of the column shall be continuous from the top of the foundation or ~~floor/ceiling~~ floor assembly below through the ceiling space to the top of the column.

716.6 (IMC [B] 607.6) Horizontal assemblies. Penetrations by ducts and air transfer openings of a floor, ~~floor/ceiling~~ assembly or the ceiling membrane of a ~~roof/ceiling~~ roof assembly shall be protected by a shaft enclosure that complies with Section 707 or shall comply with Sections 716.6.1 through 716.6.3.

716.6.1 (IMC [B] 607.6.1) (Supp) Through penetrations. In occupancies other than Groups I-2 and I-3, a duct constructed of approved materials in accordance with the *International Mechanical Code* that penetrates a fire-resistance-rated ~~floor/ceiling~~ floor assembly that connects not more than two stories is permitted without shaft enclosure protection, provided a listed fire damper is installed at the floor line or the duct is protected in accordance with Section 712.4. For air transfer openings, see Exception 7 to Section 707.2.

Exception: A duct is permitted to penetrate three floors or less without a fire damper at each floor, provided it meets all of the following requirements:

1. The duct shall be contained and located within the cavity of a wall and shall be constructed of steel not less than 0.019 inch (0.48 mm) (26 gage) in thickness.
2. The duct shall open into only one dwelling or sleeping unit and the duct system shall be continuous from the unit to the exterior of the building.

3. The duct shall not exceed 4-inch (102 mm) nominal diameter and the total area of such ducts shall not exceed 100 square inches (0.065 m²) in any 100 square feet (9.3 m²) of floor area.
4. The annular space around the duct is protected with materials that prevent the passage of flame and hot gases sufficient to ignite cotton waste where subjected to ASTM E 119 or UL 263 time-temperature conditions under a minimum positive pressure differential of 0.01 inch (2.49 Pa) of water at the location of the penetration for the time period equivalent to the fire-resistance rating of the construction penetrated.
5. Grille openings located in a ceiling of a fire-resistance-rated floor/ceiling or roof/ceiling assembly shall be protected with a listed ceiling radiation damper installed in accordance with Section 716.6.2.1.

716.6.2 (IMC [B] 607.6.2) Membrane penetrations. Ducts and air transfer openings constructed of approved materials in accordance with the *International Mechanical Code* that penetrate the ceiling membrane that is a component of a fire-resistance-rated floor/ceiling floor assembly or roof/ceiling roof assembly shall be protected with one of the following:

1. A shaft enclosure in accordance with Section 707.
2. A listed ceiling radiation damper installed at the ceiling line where a duct penetrates the ceiling that is a component of a fire-resistance-rated floor/ceiling floor assembly or roof/ceiling roof assembly.
3. A listed ceiling radiation damper installed at the ceiling line where a diffuser with no duct attached penetrates the ceiling that is a component of a fire-resistance-rated floor/ceiling floor assembly or roof/ceiling roof assembly.

721.6.1 General. This section contains procedures for calculating the fire-resistance ratings of walls, floor/ceiling floor assemblies and roof/ceiling roof assemblies based in part on the standard method of testing referenced in Section 703.2.

TABLE 721.6.2(1)
TIME ASSIGNED TO WALLBOARD MEMBRANES^{a,b,c,d}

(Portions of table not shown remain unchanged)

For SI: 1 inch = 25.4 mm.

- a. These values apply only when membranes are installed on framing members which are spaced 16 inches o.c.
- b. Gypsum wallboard installed over framing or furring shall be installed so that all edges are supported, except 5/8-inch Type X gypsum wallboard shall be permitted to be installed horizontally with the horizontal joints staggered 24 inches each side and unsupported but finished.
- c. On wood frame floor/ceiling floor assemblies or roof/ceiling roof assemblies, gypsum board shall be installed with the long dimension perpendicular to framing members and shall have all joints finished.
- d. The membrane on the unexposed side shall not be included in determining the fire resistance of the assembly. When dissimilar membranes are used on a wall assembly, the calculation shall be made from the least fire-resistant (weaker) side.
- e. The time assigned is not a finished rating.

1207.1 Scope. This section shall apply to common interior walls, partitions and floor/ceiling floor assemblies between adjacent dwelling units or between dwelling units and adjacent public areas such as halls, corridors, stairs or service areas.

1207.2 Air-borne sound. Walls, partitions and floor/ceiling floor assemblies separating dwelling units from each other or from public or service areas shall have a sound transmission class (STC) of not less than 50 (45 if field tested) for air-borne noise when tested in accordance with ASTM E 90. Penetrations or openings in construction assemblies for piping; electrical devices; recessed cabinets; bathtubs; soffits; or heating, ventilating or exhaust ducts shall be sealed, lined, insulated or otherwise treated to maintain the required ratings. This requirement shall not apply to dwelling unit entrance doors; however, such doors shall be tight fitting to the frame and sill.

1207.3 Structure-borne sound. Floor/ceiling Floor assemblies between dwelling units or between a dwelling unit and a public or service area within the structure shall have an impact insulation class (IIC) rating of not less than 50 (45 if field tested) when tested in accordance with ASTM E 492.

3410.6.3.2 (IEBC 1301.6.3.2) Floor/ceiling Floor construction. A floor/ceiling floor assembly used to create compartments shall conform to Section 711 and shall have a fire-resistance rating of not less than 2 hours.

PART II – IBC STRUCTURAL

Revise definition as follows:

**SECTION 1502
DEFINITIONS**

ROOF ASSEMBLY. A system designed to provide weather protection and resistance to design loads. The system consists of a roof covering and roof deck or a single component serving as both the roof covering and the roof deck. A roof assembly includes the roof deck, vapor retarder, substrate or thermal barrier, insulation, vapor retarder and roof covering.

The definition of “Roof assembly” is limited in application to the provisions of Chapter 15.

PART III – IFC

Revise as follows:

703.3 Ceilings. The hanging and displaying of salable goods and other decorative materials from acoustical ceiling systems that are ~~part~~ component of a fire-resistance-rated ~~floor/ceiling~~ floor assembly or ~~roof/ceiling~~ roof assembly, shall be prohibited.

914.3.1 (IBC [F] 403.2) Automatic sprinkler system. Buildings and structures shall be equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 and a secondary water supply where required by Section 903.3.5.2.

Exception: An automatic sprinkler system shall not be required in spaces or areas of:

1. Open parking garages in accordance with Section 406.3 of the *International Building Code*.
2. Telecommunication equipment buildings used exclusively for telecommunications equipment, associated electrical power distribution equipment, batteries and standby engines, provided that those spaces or areas are equipped throughout with an automatic fire detection system in accordance with Section 907.2 and are separated from the remainder of the building by fire barriers consisting of not less than 1-hour fire-resistance-rated walls and 2-hour fire-resistance-rated ~~floor/ceiling~~ floor assemblies.

903.3.1.1.1 (IBC [F] 903.3.1.1.1) Exempt locations. Automatic sprinklers shall not be required in the following rooms or areas where such rooms or areas are protected with an approved automatic fire detection system in accordance with Section 907.2 that will respond to visible or invisible particles of combustion. Sprinklers shall not be omitted from any room merely because it is damp, of fire-resistance rated construction or contains electrical equipment.

1. Any room where the application of water, or flame and water, constitutes a serious life or fire hazard.
2. Any room or space where sprinklers are considered undesirable because of the nature of the contents, when approved by the fire code official.
3. Generator and transformer rooms separated from the remainder of the building by walls and ~~floor/ceiling~~ floor assemblies or ~~roof/ceiling~~ roof assemblies having a fire-resistance rating of not less than 2 hours.
4. Rooms or areas that are of noncombustible construction with wholly noncombustible contents.
5. Fire service access elevator machine rooms and machinery spaces.

1504.3.2.5 Clear space. Spray booths shall be installed so that all parts of the booth are readily accessible for cleaning. A clear space of not less than 3 feet (914 mm) shall be maintained on all sides of the spray booth. This clear space shall be kept free of any storage or combustible construction.

Exceptions:

1. This requirement shall not prohibit locating a spray booth closer than 3 feet (914 mm) to or directly against an interior partition, wall or ~~floor/ceiling~~ floor assembly that has a fire-resistance rating of not less than 1 hour, provided the spray booth can be adequately maintained and cleaned.
2. This requirement shall not prohibit locating a spray booth closer than 3 feet (914 mm) to an exterior wall or a roof assembly, provided the wall or roof is constructed of noncombustible material and the spray booth can be adequately maintained and cleaned.

Reason: The purpose for this proposal is to harmonize the terms used to describe horizontal assemblies, which are fire-resistance-rated by virtue of the definition for “horizontal assembly” in Section 702.1. The terms in question are “floor assembly,” “floor/ceiling assembly,” “roof assembly” and “roof/ceiling assembly.” None are currently defined in the IBC or IFC, except for “roof assembly” (see below), and this proposal does not propose definitions for them. Instead, “floor/ceiling assembly” and “roof/ceiling assembly” are replaced by “floor assembly” and “roof assembly.”

In most cases, the replacements are technically sound. There are certain code provisions, however, that specify requirements for ceilings or ceiling membranes the horizontal assemblies rely on for their fire-resistance-ratings. In many of these cases, the current provisions specify “floor/ceiling assembly” or “roof/ceiling assembly” for the purpose of identifying those horizontal assemblies with such ceilings or ceiling membranes. These terms, however, are typically ineffective in accomplishing this purpose. As stated above, “floor/ceiling assembly” and “roof/ceiling assembly” are not defined by the IBC or IFC. Thus, they have no technical meaning except to the extent that a technical meaning can be derived from the ordinarily accepted meanings of “floor/ceiling” or “roof/ceiling” for which I am unable to find in the dictionaries at my disposal (refer to Section 201.4). “Floor/ceiling” and “roof/ceiling” could be interpreted as meaning “floor or ceiling” and “roof or ceiling,” or “floor and ceiling” and “roof and ceiling,” none of which serve the purpose for which these terms are currently used. These terms are archaic and should be replaced, which this proposal accomplishes.

The problems caused by these terms are not limited to the use of “floor/ceiling assembly” and “roof/ceiling assembly” as noted above. “Floor/ceiling assembly” and “floor assembly” are frequently specified alone, rather than together, in provisions for which there is no apparent reason for favoring one or the other. When “floor/ceiling assembly,” but not “floor assembly,” is specified, are floor assemblies exempt from the requirements but floor/ceiling assemblies are not? What about when “floor assembly,” but not “floor/ceiling assembly” is specified? The situation is similar with “roof/ceiling assembly” and “roof assembly.” The proposal eliminates this uncertainty.

Section 711.1 on horizontal assemblies states that “floor and roof assemblies required to have a fire-resistance-rating shall comply with this section” (i.e., horizontal assemblies). There are no comparable requirements in the IBC, however, for a floor/ceiling assembly or a roof/ceiling assembly. The requirements in Section 711 for horizontal assemblies ensure that fire-resistance-rated floor assemblies and roof assemblies provide fire containment (i.e., compartmentation) between stories by means of the requirements in Section 711 for continuity and the fire-resistance-rated protection of penetrations, joints and other openings. There are exceptions for roof assemblies and the fire-protection-rated protection of certain penetrations and openings (e.g., contained with the cavity of a wall, fire dampers at ducts connecting two stories, etc.), but the overall effect is that horizontal fire containment is achieved when the provisions for horizontal assemblies are met. This can not be said for floor/ceiling and roof/ceiling assemblies when there are no comparable provisions for them in the IBC.

There still remains the issue of those code provisions that specify requirements for ceilings or ceiling membranes the horizontal assemblies rely on for their fire-resistance-ratings. Replacing “floor/ceiling assembly” and “roof/ceiling assembly” with “floor assembly” and “roof assembly” does not solve the problem. This proposal solves the problem in these cases by inserting language specifying the ceilings or ceiling membranes that the horizontal assemblies rely on. This is typically done by specifying the “ceiling (or ceiling membrane) that is a component of a fire-resistance-rated floor assembly or roof assembly.” Refer to IBC Sections 508.2.5.2, 708.4, 711.3.1, 711.3.2, 712.4, 712.4.1, 712.4.1.2 and 716.6.2, and IFC Section 703.3.

Section 1502.1 currently defines “roof assembly” for use in the provisions of Chapter 15. The use of “roof assembly” in this context is clearly distinct from its use elsewhere in the IBC and IFC. The proposal adds clarification to the listing of “roof assembly” in Sections 202 and 1502.1 to make the distinction clear.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Errata: FS2-07/08 Part I: Add Section 707.1 and revise the first paragraph of Section 707.2 as follows:

707.1 General. The provisions of this section shall apply to vertical shafts where such shafts are required to protect openings and penetrations through ~~floor/ceiling floor~~ and ~~roof/ceiling roof~~ assemblies. Shaft enclosures shall be constructed as fire barriers in accordance with Section 706 or horizontal assemblies in accordance with Section 711, or both.

707.2 Shaft enclosure required. Openings through a ~~floor/ceiling floor~~ assembly shall be protected by a shaft enclosure complying with this section.

Delete Section 914.3.1 (IBC [F] 403.2) from Part III IFC of the proposed change without substitution:

PART I – IBC FIRE SAFETY

Committee Action:

Disapproved

Committee Reason: The committee felt that these revisions to floor/ceiling and roof/ceiling did not add clarity to the code and could result in two meanings for the term roof, which could result in confusion. Further, the committee felt that changing the terminology would not be cost effective as it would require industry to re-publish product literature with the revised terminology.

Assembly Action:

None

PART II – IBC STRUCTURAL

Committee Action:

Approved as Submitted

Committee Reason: The committee agreed that the definition of “roof assembly” in Section 1502 is specific to Chapter 15 and this proposal makes that clear.

Assembly Action:

None

PART III – IFC

Committee Action:

Disapproved

Committee Reason: The proposed change is not needed. The correct, commonly accepted terms used in the International Codes are floor/ceiling and roof/ceiling assembly. This will also correlate with the disapproval action taken by the IBC-FS Committee.

Assembly Action:

None

Final Hearing Results

FS2-07/08, Part I	D
FS2-07/08, Part II	AS
FS2-07/08, Part III	D

Code Change No: **FS4-07/08**

Original Proposal

Section: 702

Proponent: Marcelo M. Hirschler, GBH International, representing American Fire Safety Council

THESE PROPOSALS ARE ON THE AGENDA OF THE IBC FIRE SAFETY AND THE IRC B/E CODE DEVELOPMENT COMMITTEES AS 2 SEPARATE CODE CHANGES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES

PART I – IBC FIRE SAFETY

Revise definition as follows:

**SECTION 702
DEFINITIONS**

FIREBLOCKING. Building materials or materials approved for use as fireblocking, installed to resist the free passage of flame to other areas of the building through concealed spaces.

PART II – IRC BUILDING/ENERGY

Revise definition as follows:

FIREBLOCKING (Supp). Building materials or materials ~~labeled~~ approved for use as fireblocking, installed to resist the free passage of flame to other areas of the building through concealed spaces.

Reason: (IBC) This proposal is intended to create consistency between the definition and the actual requirements in the code. A companion proposal is being submitted to the IRC to create an identical definition for the building code. Sections 717.2.1 and 712.4.2.2 of the IBC (and other sections, as well as section R602.8) discuss what fireblocking materials are permitted. All fireblocking materials must be approved, either through being in a list or by direct approval by the authority having jurisdiction, but they do not necessarily have to be labeled.

(IRC) This proposal is intended to create consistency between the definition and the actual requirements in the code. A companion proposal is being submitted to the IBC to create an identical definition for the building code. Section R602.8 of the IRC (and sections 717.2.1 and 712.4.2.2 of the IBC and other sections) discuss what fireblocking materials are permitted. All fireblocking materials must be approved, either through being in a list or by direct approval by the authority having jurisdiction, but they do not necessarily have to be labeled.

Cost Impact: (IBC) The code change proposal will not increase the cost of construction.
(IRC) The code change proposal should not increase the cost of construction.

Public Hearing Results

**PART I – IBC FIRE SAFETY
Committee Action:**

Approved as Submitted

Committee Reason: The committee agreed that the definition of fireblocking and the actual requirements in the code for fireblocking needed to be consistent. Further, the committee indicated that the added language was required for proper enforcement. Therefore, this proposed change to add "materials approved for use as fireblocking" to the definition of fireblocking was deemed appropriate.

Assembly Action:

None

**PART II – IRC B/E
Committee Action:**

Approved as Submitted

Committee Reason: This change clarifies that fireblocking only needs to be "Approved" and not "Labeled".

Assembly Action:

None

Final Hearing Results

FS4-07/08, Part I	AS
FS4-07/08, Part II	AS

Code Change No: FS10-07/08

Original Proposal

Section: 703.6

Proponent: Ron Nickson, National Multi Housing Council (NMHC)

Revise as follows:

703.6 Marking and identification. Fire walls, fire barriers, fire partitions, smoke barriers and smoke partitions or any other wall required to have protected openings or penetrations shall be effectively and permanently identified with signs or stenciling. Such identification shall:

1. Be located above any decorative ceiling, in concealed spaces or other approved location;
2. Be repeated at intervals not exceeding 30 feet (914 mm) measured horizontally along the wall or partition;
and
3. Include lettering not less than 0.5 inch (12.7 mm) in height, incorporating the suggested wording: "FIRE AND/OR SMOKE BARRIER – PROTECT ALL OPENINGS", or other approved wording.

Exception: Walls in Group R-2 occupancies that do not have a removable decorative ceiling allowing access to the concealed space.

Reason: To provide a reasonable exception for R-2 occupancies. The new section 703.6 would required the marking in a location that is not accessible in the typical apartment building in which the walls and ceilings are covered with either ½" of 5/8" Type C fire rated drywall installed as part of the code required fire rated assembly between dwelling units under the requirements of Section 420. The fire rated walls in these R-2 use areas are also not seldom altered after original construction of the residential building, unlike the potential constant changes in other types of commercial buildings that may provide for inexperienced workmen accessible to workmen that might inadvertently damage damaging the wall and thus create an issue with the ability of the wall to work as designed.

Cost Impact: The code change proposal will not increase the cost of construction. This code change will reduce costs.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The committee agreed that marking or signage identifying fire-resistance rated, or smoke, barriers or partitions within Group R-2 occupancies that do not have a removable ceiling was not necessary. Without this exception the marking or signage in a typical hotel room would be required on all interior walls of the room.

Assembly Action:

None

Final Hearing Results

FS10-07/08

AS

Code Change No: **FS11-07/08**

Original Proposal

Section: 703.6

Proponent: Lawrence G. Perry, AIA, representing Building Owners and Managers Association (BOMA) International

Delete without substitution as follows:

~~**703.6 (Supp) Marking and identification.** Fire walls, fire barriers, fire partitions, smoke barriers and smoke partitions or any other wall required to have protected openings or penetrations shall be effectively and permanently identified with signs or stenciling. Such identification shall:~~

- ~~1. Be located above any decorative ceiling, in concealed spaces or other approved location;~~
- ~~2. Be repeated at intervals not exceeding 30 feet (914 mm) measured horizontally along the wall or partition; and~~
- ~~3. Include lettering not less than 0.5 inch (12.7 mm) in height, incorporating the suggested wording: "FIRE AND/OR SMOKE BARRIER – PROTECT ALL OPENINGS", or other approved wording.~~

Reason: This proposal seeks to remove the provision requiring marking of fire rated assemblies that was added by a successful public comment at the Rochester Final Hearings. As approved, this new section will require markings on the following walls:

- Interior and exterior sides of exterior walls (where the walls are required to have a fire-resistance rating).
- All walls separating residential dwelling units from adjacent units or corridors.
- All walls separating hotel guest rooms from adjacent rooms or corridors.

As written, this new section also requires the markings of ceilings, and possibly floors, where these assemblies are part of a smoke barrier.

Some of the testimony on this issue noted that these markings would be hidden behind decorative ceilings, however, the approved language requires these markings at all rated positions, and only provides additional information as to where to locate the markings when decorative ceilings are provided.

Representatives from several jurisdictions last cycle indicated that they already require this; however, the text approved requires markings in far more locations, and in far more visible locations, than other local amendments and enforcement levels.

There is no evidence that providing these markings, will provide any reduction in the problem of trades creating openings and failing to properly seal them. If anything, this change will likely lead to a false sense of protection; someone seeing this marking, and not already understanding the complexity of fire rated assemblies, firestopping products and installation methods, will simply fill the opening with whatever material they have on hand.

BOMA has submitted a separate code change to address the concerns raised by the proponent of this change in a different manner; a proposed revision to IFC section 509.1 (and correlative change to IBC 911.1) would add, for buildings with fire command centers, information regarding the location of these rated wall assemblies to the schematic building plans that are already required to be provided.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The committee agreed that the requirements dealing with marking or signage identifying fire-resistance rated, or smoke, barriers or partitions were appropriate and should remain in the code. These assemblies should be identified for the construction trades to avoid breaching of the assemblies during construction that will occur during alterations, additions or repairs.

Assembly Action:

None

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because public comments were submitted.

Public Comment 2:

Michael Viera, Willdan, representing Sacramento Valley Association of Building Officials (SVABO) requests Approved as Modified by this public comment.

Replace the proposal with the following:

703.6 (Supp) Marking and Identification. Fire walls, fire barriers, fire partitions, smoke barriers and smoke partitions or any other wall required to have protected openings or penetrations shall be effectively and permanently identified with signs or stenciling. Such identification shall:

1. Be located ~~above any decorative ceiling, in accessible concealed floor, floor-ceiling, or attic spaces or other approved location; and~~
2. Be repeated at intervals not exceeding 30 feet (914mm) measured horizontally along the wall or partition; and
3. Include lettering not less than 0.5 inch (12.7mm) in height, incorporating the suggested wording: "FIRE AND/OR SMOKE BARRIER – PROTECT ALL OPENINGS", or other approved wording.

Commenter's Reasons: Concerns were raised at the code hearings in Palm Springs that the code text approved in Rochester was too broad and would require marking of all fire and smoke rated walls, barriers, and partitions, including exterior walls, corridors, etc. We believe the intent of the code was to protect those walls, barriers, and partitions in locations that generally were not visible to the building occupants, where utility piping, wiring, ducts, or other service elements are generally installed. We believe the proposed text clarifies the locations where the identification is necessary.

Final Hearing Results

FS11-07/08

AMPC2

Code Change No: FS14-07/08

Original Proposal

Section: 704.2

Proponent: Gary Lampella, City of Redmond, OR, representing Oregon Building Officials Association

Revise as follows:

704.2 Projections. Cornices, eave overhangs, exterior balconies and similar projections extending beyond the ~~floor area~~ exterior wall shall conform to the requirements of this section and Section 1406. Exterior egress balconies and exterior exit stairways shall also comply with Sections 1014.5 and 1023.1, respectively. Projections shall not extend beyond the distance determined by the following ~~two~~ three methods, whichever results in the lesser projection:

1. A point one-third the distance from the exterior face of the wall to the lot line where protected openings or a combination of protected and unprotected openings are required in the exterior wall, from an assumed vertical plane located where protected openings are required in accordance with Section 704.8.
2. A point one-half the distance from the exterior face of the wall to the lot line where all openings in the exterior wall are permitted to be unprotected or the building is equipped throughout with an automatic sprinkler system installed under the provisions of Section 704.8.2. (Supp)
- 2 ~~3~~. More than 12 inches (305 mm) into areas where openings are prohibited.

Buildings on the same lot and considered as portions of one building in accordance with Section 704.3 are not required to comply with this section.

Reason: The provision for projections in Section 704.2 is language from a legacy code that had definite measurements for when openings were required to be protected and when they were prohibited based on occupancy and construction type. With Section 704.8 and Table 704.8, the absolute measurement that was used in the previous legacy code is no longer present. This makes it very difficult to apply and has created inconsistency in application. There is different terminology between the IBC and the legacy code that does not allow the user to adequately apply this section.

The legacy code said "Projections beyond the exterior wall shall comply with Section 705 and shall not extend beyond:" This was very clear that the projections started at the exterior surface of the exterior wall.

The IBC states, "Cornices, eave overhangs, exterior balconies and similar projections extending beyond the floor area shall conform to the requirements of this section and Section 1406." This is very misleading and confusing. The term floor area is defined in Section 1002 which says the floor area is the "area within the inside perimeter of the exterior walls of the building." Using this definition, projections need to be measured from the inside perimeter of the exterior wall, making everything that is outside of the inside perimeter of the exterior walls a projection, including the exterior wall itself. We understand that the definition of floor area also includes usable space without walls under the horizontal projection of the floor or roof above, but the term "projection" in that definition already indicates that the floor or roof above is a projection. These floors and roofs should already be regulated as projections, not the area of usable space under them. We're not sure how you would have a projection from a space without exterior walls that is already under a projection.

The legacy code also stated that the assumed vertical plane for protection of openings was when they were "first" required to be protected. There was a table that had definite measurements that were constant based upon occupancy and construction type. IBC Table 704.8 does not have a provision where you can definitely apply this assumed vertical plane. Utilizing the provisions of Equation 7-2 in Section 704.8 for a non-sprinklered M occupancy of IIB construction 7 feet from the lot line if the combination of protected and unprotected was less than or equal to 1, there would be some required protected openings in the wall. But looking at the Table 704.8, protected openings could be required at 10 feet from the lot line using the same equation. Does one measure the distance from wall and its location in relation to the lot line or from the point at 10 feet where some protected openings would have been required? Or from some other assumed vertical plane?

The intent of this code change is to set a definite line where one can measure this distance from. Without it, this section of the code will continue to be misapplied and inconsistently enforced. There are widely varying interpretation of how to apply Section 704.2 to Section 704.8, none of which has adequately come close to explaining how these two sections interact with each other.

- The first amendment changes the term "floor area" to "exterior wall" so it's clear where one measures from.
- The second change simply makes it clear that the measurement is taken from the exterior surface of the wall sets the actual wall location as the assumed vertical plane for walls with protected openings or a combination of protected and unprotected openings. It also deletes the reference to Section 704.8, which we contend is a major part of the problem.
- The third change is recognizing walls that are permitted to have all openings unprotected and the benefits of have a fire sprinkler system. It also makes it clear that the measurement is taken from the exterior surface of the wall and sets the location of the wall as the vertical plane. We felt that if all openings could be unprotected or a sprinkler system was installed, a greater projection distance could be allowed. That is not recognized as a factor in the current language of Section 704.2.
- The fourth changes makes it clear that buildings on the same lot and considered as one building are exempt from this section.

It is important to note that although the closer to the lot line the building gets the projections also get closer to the lot line incrementally, the projection decrease in distance in the same manner

Simply stated, you can put a square peg in a round hole. If you really look at the current provisions of Section 704.2 and how to apply it to Section 704.8, it doesn't flow very well, is based on two very different code philosophies and requirements, and is very difficult if not impossible, to determine the assumed imaginary line.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The committee agreed with the proponent in that this proposal adds clarity to the allowable projections requirements by indicating that the location from which projection measurements are to be taken is from the exterior face of the wall.

Assembly Action:

None

Final Hearing Results

FS14-07/08

AS

Code Change No: FS16-07/08

Original Proposal

Section: 704.5

Proponent: Gregory Lake, Sacramento Metropolitan Fire District, representing California Fire Chief's Association (Cal Chiefs)

Revise as follows:

704.5 Fire-resistance ratings. Exterior walls shall be fire-resistance rated in accordance with Tables 601 and 602 and this section. The required fire-resistance rating of exterior walls with a fire separation distance of greater than 5 feet (1524 mm) 10 feet (3048 mm) shall be rated for exposure to fire from the inside. The required fire-resistance rating of exterior walls with a fire separation distance of ~~5 feet (1524 mm)~~ or less than or equal to 10 feet (3048 mm) shall be rated for exposure to fire from both sides.

Reason: This code change proposal is a follow up to our previous Code Change FS20-06/07 which was recommended for disapproval by the Committee. We submitted a Public Comment for approval for discussion during the ICC Final Action Hearings in Rochester, N.Y. We were successful in overturning the Committee's recommendation for disapproval but failed to achieve the necessary 2/3 majority vote for approval by the narrow margin of 111 to 66. Because of the strong interest expressed by the Class A voting members at the hearings, we decided to resubmit this code change proposal for the Committee's consideration. However, in order to make the code change proposal more acceptable to the Committee, we deleted one of the provisions that required all exterior bearing walls to have the fire resistance rating based on fire exposures to both the exterior face and the interior face. In other words, we revised the previous code change proposal to only increase the fire separation distance from 5 feet to 10 feet for the purpose of requiring such exterior walls within that fire separation distance to have their fire resistance rating determined by the fire exposures conducted on both sides of the wall. Thus, any exterior wall required to have a fire resistance rating which has a fire separation distance of more than 10 feet would only be required to have its fire resistance rating determined by fire exposure from the inside. We believe this to be the more critical element of our original code change in order to better prevent building to building fire spread where buildings are in close proximity to each other.

This code change addresses concerns about the provisions of Section 704.5 that permit the fire resistance rating of an exterior wall with a fire separation distance greater than 5 feet to be determined based on fire exposure only to the inside face of the wall. The concerns are based on the provisions of Section 704.8, item 2, which permit an exterior wall that is not required to have a fire resistance rating to have unlimited unprotected openings. Since Table 602 permits non-fire resistance rated exterior walls in buildings of Types IIB and VB construction in all occupancy groups except H where the fire separation distance is 10 feet or greater, the potential exists for buildings with walls rated from the inside only to be exposed to significant levels of radiant heat. The radiant heat exposure will likely cause walls with combustible components to ignite and burn from the outside, and walls with noncombustible structural components to be reduced in strength. Regardless of the construction of the wall, the degradation caused to the wall may result in collapse and/or fire penetration of the wall by the fire before the time of the required fire-resistance rating has elapsed based on the fire-resistance rating being determined by interior fire exposure only.

To illustrate the impact of the provision of Section 704.5 of concern, assume two buildings of Group S-1 occupancy and Type VB construction are erected on either side of a property line. One building has a fire separation distance of 10 feet. Based on these parameters, Table 602 does not require a fire resistance rating for the exterior wall since it is set back 10 feet. Therefore, unlimited unprotected openings are permitted in the wall. The second building has a fire separation distance of 5.01 feet; therefore, Table 602 requires the exterior wall to have a fire resistance rating of 1 hour and unprotected openings are restricted to 10% of the wall area. However, Section 704.5 indicates that since the wall has a fire separation distance of greater than 5 feet, the fire-resistance rating of the wall only needs to be established for exposure to fire from the inside.

The opening limitations of the IBC, which were originally developed for the BOCA National Building Code (NBC), are intended to limit the radiant heat from a fire in an exposing building so that the radiant heat striking an exposed building does not exceed 12.5 kW/m². It is generally accepted that wood-based products can withstand exposure to this level of radiation in the presence of a pilot flame without igniting. If radiant heat levels exceed this amount, ignition is likely since "pilot flames" in the form of flying brands are likely to be present. Auto-ignition (without a flame present) of wood-based products generally occurs at radiation levels of 35 to 45 kW/m² after exposure for about 20 to 25 seconds.

During the development of the IBC, it was decided that if an exterior wall had no required fire-resistance rating, unlimited unprotected openings would be permitted. Since Table 602 does not require exterior walls of buildings (other than Group H) of Types IIB and VB construction to be fire-resistance rated where the fire separation distance is 10 feet or greater, 100% unprotected openings are permitted. Therefore, fires in these buildings are likely to expose adjacent buildings to considerably more radiant heat than 12.5 kW/m².

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The committee agreed that a building wall with a fire separation distance of 10 feet or less could be exposed to a significant amount of radiant heat causing ignition of combustible components on the exterior wall or a reduction of strength in noncombustible structural elements within the exterior wall. Therefore, requiring a fire-resistance rating of an exterior wall to be from both sides where the wall has a fire separation distance of 10 feet or less is appropriate.

Assembly Action:

None

Final Hearing Results

FS16-07/08

AS

Code Change No: FS20-07/08**Original Proposal**

Sections: 704.8.6, 711.3.3, 711.4, 721.5.2.3, 410.4, 414.2.4, 509.5, 509.6, 805.1.1, 805.1.2, 909.20.2; IFC 2703.8.3.4

Proponent: Philip Brazil, Reid Middleton, Inc., representing himself

THESE PROPOSALS ARE ON THE AGENDA OF THE IBC GENERAL, THE IBC FIRE SAFETY AND THE IFC CODE DEVELOPMENT COMMITTEES AS 3 SEPARATE CODE CHANGES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES

PART I – IBC GENERAL**Revise as follows:**

410.4 Platform construction. Permanent platforms shall be constructed of materials as required for the type of construction of the building in which the permanent platform is located. Permanent platforms are permitted to be constructed of fire-retardant-treated wood for Type I, II, and IV construction where the platforms are not more than 30 inches (762 mm) above the main floor, and not more than one-third of the room floor area and not more than 3,000 square feet (279m²) in area. Where the space beneath the permanent platform is used for storage or any other purpose other than equipment, wiring or plumbing, the floor ~~construction assembly~~ shall not be less than 1-hour fire-resistance-rated construction. Where the space beneath the permanent platform is used only for equipment, wiring or plumbing, the underside of the permanent platform need not be protected.

414.2.4 Fire-resistance-rating requirements. The required fire-resistance rating for fire barriers shall be in accordance with Table 414.2.2. The floor ~~construction assembly~~ of the control area and the construction supporting the floor of the control area shall have a minimum 2-hour fire-resistance rating.

Exception: The floor ~~construction assembly~~ of the control area and the construction supporting the floor of the control area are allowed to be 1-hour fire-resistance rated in buildings of Type IIA, IIIA and VA construction, provided that both of the following conditions exist:

1. The building is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1, and
2. The building is three stories or less above grade plane.

509.5 Group R-1 and R-2 buildings of Type IIIA construction. The height limitation for buildings of Type IIIA construction in Groups R-1 and R-2 shall be increased to six stories and 75 feet (22 860 mm) where the first-floor ~~construction assembly~~ above the basement has a fire-resistance rating of not less than 3 hours and the floor area is subdivided by 2-hour fire-resistance-rated fire walls into areas of not more than 3,000 square feet (279 m²).

509.6 Group R-1 and R-2 buildings of Type IIA construction. The height limitation for buildings of Type IIA construction in Groups R-1 and R-2 shall be increased to nine stories and 100 feet (30 480 mm) where the building is separated by not less than 50 feet (15 240 mm) from any other building on the lot and from lot lines, the exits are segregated in an area enclosed by a 2-hour fire-resistance-rated fire wall and the first-floor ~~construction assembly~~ has a fire-resistance rating of not less than 1½ hours.

PART II – IBC FIRE SAFETY**Revise as follows:**

704.8.6 (Supp) Vertical exposure. For buildings on the same lot, opening protectives having a fire protection rating of not less than ¾ hour shall be provided in every opening that is less than 15 feet (4572 mm) vertically above the roof of an adjacent building or structure based on assuming an imaginary line between them. The opening protectives are required where the fire separation distance between the imaginary line and the adjacent building or structure is less than 15 feet (4572 mm).

Exceptions:

1. Opening protectives are not required where the roof ~~construction assembly~~ of the adjacent building or structure has a fire-resistance rating of not less than 1 hour for a minimum distance of 10 feet (3048 mm) from the exterior wall facing the imaginary line and the entire length and span of the supporting elements for the fire-resistance-rated roof assembly has a fire-resistance rating of not less than 1 hour.
2. Buildings on the same lot and considered as portions of one building in accordance with Section 704.3 are not required to comply with Section 704.8.6.

711.3.3 Unusable space. In 1-hour fire-resistance-rated floor ~~construction assemblies~~, the ceiling membrane is not required to be installed over unusable crawl spaces. In 1-hour fire-resistance-rated roof ~~construction assemblies~~, the floor membrane is not required to be installed where unusable attic space occurs above.

711.4 (Supp) Continuity. Assemblies shall be continuous without openings, penetrations or joints except as permitted by this section and Sections 707.2, 712.4, 713 and 1020.1. Skylights and other penetrations through a fire-resistance-rated roof deck or slab are permitted to be unprotected, provided that the structural integrity of the fire-resistance-rated roof ~~construction assembly~~ is maintained. Unprotected skylights shall not be permitted in roof ~~construction assemblies~~ required to be fire-resistance rated in accordance with Section 704.10. The supporting construction shall protected to afford the required fire-resistance rating of the horizontal assembly supported.

Exception: In buildings of Type IIB, IIIB or VB construction, the construction supporting the horizontal assembly is not required to be fire-resistance-rated at the following:

1. Horizontal assemblies at the separations of incidental uses as specified by Table 508.2, provided the required fire-resistance rating does not exceed 1-hour.
2. Horizontal assemblies at the separations of dwelling units and sleeping units as required by Section 419.3.
3. Horizontal assemblies at smoke barriers constructed in accordance with Section 709.

721.5.2.3 (Supp) Structural steel trusses. The fire resistance of structural steel trusses protected with fire-resistant materials sprayed to each of the individual truss elements shall be permitted to be determined in accordance with this section. The thickness of the fire-resistant material shall be determined in accordance with Section 721.5.1.3. The weight-to-heated-perimeter ratio (W/D) of truss elements that can be simultaneously exposed to fire on all sides shall be determined on the same basis as columns, as specified in Section 721.5.1.1. The weight to-heated-perimeter ratio (W/D) of truss elements that directly support floor or roof ~~construction assembly~~ shall be determined on the same basis as beams and girders, as specified in Section 721.5.2.1.

The fire resistance of structural steel trusses protected with intumescent or mastic fire-resistant coatings shall be determined on the basis of fire-resistance tests in accordance with Section 703.2.

805.1.1 Subfloor construction. Floor sleepers, bucks and nailing blocks shall not be constructed of combustible materials, unless the space between the fire-resistance-rated floor ~~construction assembly~~ and the flooring is either solidly filled with approved noncombustible materials or fireblocked in accordance with Section 717, and provided that such open spaces shall not extend under or through permanent partitions or walls.

805.1.2 Wood finish flooring. Wood finish flooring is permitted to be attached directly to the embedded or fireblocked wood sleepers and shall be permitted where cemented directly to the top surface of approved fire-resistance-rated floor ~~construction assembly~~ or directly to a wood subfloor attached to sleepers as provided for in Section 805.1.1.

909.20.2 Construction. The smokeproof enclosure shall be separated from the remainder of the building by not less than a 2-hour fire barrier without openings other than the required means of egress doors. The vestibule shall be separated from the stairway by not less than a 2-hour fire barrier. The open exterior balcony shall be constructed in accordance with the fire-resistance-rating requirements for floor ~~construction assemblies~~.

PART III – IFC**Revise as follows:**

2703.8.3.4 Fire-resistance rating requirements. The required fire-resistance rating for fire barriers shall be in accordance with Table 2703.8.3.2. The floor ~~construction assembly~~ of the control area and the construction supporting the floor of the control area shall have a minimum 2-hour fire-resistance rating.

Exception: The floor ~~construction~~ assembly of the control area and the construction supporting the floor of the control area is allowed to be 1-hour fire-resistance rated in buildings of Type IIA, IIIA and VA construction, provided that both of the following conditions exist:

1. The building is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1; and
2. The building is three stories or less in height.

Reason: Section 711.1 on horizontal assemblies states that “floor and roof assemblies required to have a fire-resistance-rating shall comply with this section” (i.e., horizontal assemblies). There are no comparable requirements in the IBC, however, for floor construction or roof construction. The requirements in Section 711 for horizontal assemblies ensure that fire-resistance-rated floor assemblies and roof assemblies provide fire containment (i.e., compartmentation) between stories by means of the requirements in Section 711 for continuity and the fire-resistance-rated protection of penetrations, joints and other openings. There are exceptions for roof assemblies and the fire-protection-rated protection of certain penetrations and openings (e.g., contained with the cavity of a wall, fire dampers at ducts connecting two stories, etc.), but the overall affect is that horizontal fire containment is achieved when the provisions for horizontal assemblies are met.

Fire-resistance-rated floor construction and roof construction, by virtue of their listings in Table 601 on fire-resistance rating requirements for building elements, provide fire endurance in the same manner that the structural frame, bearing walls and other structural building elements are required to be fire-resistance-rated due to their listings in Table 601. This fire endurance maintains structural integrity during a fire event but it does not provide fire containment in the manner that is provided by fire barriers and horizontal assemblies.

The code sections in this proposal currently specify requirements for fire-resistance-rated floor or roof construction or reference fire-resistance-rated floor or roof construction for related purposes. The intent of these provisions, however, is judged to specify or reference fire-resistance-rated floor assemblies or roof assemblies for the purpose of providing fire containment in addition to the fire endurance provided by being listed in Table 601. The proposal changes floor construction to floor assembly(ies) and roof construction to roof assembly(ies) in the necessary code sections consistent with the judgment that fire containment in addition to fire endurance is intended.

Certain provisions of the IBC apply specifically to the listings in Table 601 and are not affected by this proposal. They are Sections 602.4.3, 1406.3 and 3104.3 (Exception #2).

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Errata: FS20-07/08, PART II: Revise Sections 711.3.3, 711.4 and 909.20.2 as follows:

711.3.3 Unusable space. In 1-hour fire-resistance-rated floor ~~construction~~ assemblies, the ceiling membrane is not required to be installed over unusable crawl spaces. In 1-hour fire-resistance-rated roof ~~construction~~ assemblies, the floor membrane is not required to be installed where unusable attic space occurs above.

711.4 (Supp) Continuity. Assemblies shall be continuous without openings, penetrations or joints except as permitted by this section and Sections 707.2, 712.4, 713 and 1020.1. Skylights and other penetrations through a fire-resistance-rated roof deck or slab are permitted to be unprotected, provided that the structural integrity of the fire-resistance-rated roof ~~construction~~ assembly is maintained. Unprotected skylights shall not be permitted in roof ~~construction~~ assemblies required to be fire-resistance rated in accordance with Section 704.10. The supporting construction shall protected to afford the required fire-resistance rating of the horizontal assembly supported.

909.20.2 Construction. The smokeproof enclosure shall be separated from the remainder of the building by not less than a 2-hour fire barrier without openings other than the required means of egress doors. The vestibule shall be separated from the stairway by not less than a 2-hour fire barrier. The open exterior balcony shall be constructed in accordance with the fire-resistance-rating requirements for floor ~~construction~~ assemblies.

PART I – IBC GENERAL

Committee Action:

Approved as Submitted

Committee Reason: Clarifies that the terms “floor construction” and “roof construction” are intended to mean “floor assembly” and “roof assembly”, respectively. This provides consistency of terms throughout the code.

Assembly Action:

None

PART II – IBC FIRE SAFETY

Committee Action:

Approved as Submitted

Committee Reason: The committee agreed that the intent of the revised sections is to specify or reference fire-resistance-rated floor assemblies or roof assemblies for the purpose of providing fire containment in addition to the fire endurance provided by being listed in Table 601. The proposal appropriately changes floor construction to floor assembly(ies) and roof construction to roof assembly(ies) in these code sections.

Assembly Action:

None

PART III – IFC

Committee Action:

Approved as Submitted

Committee Reason: The change will provide correct and properly correlated terminology between the IBC and the IFC for fire-resistance-rated floor and roof construction. This action is also consistent with the action taken by the IBC-G and IBC-FS Committees.

Assembly Action:

None

Final Hearing Results

FS20-07/08, Part I	AS
FS20-07/08, Part II	AS
FS20-07/08, Part III	AS

Code Change No: FS22-07/08

Original Proposal

Sections: 705.1.1, 402.7.3, 402.7.3.1, 402.7.3.2 (New), 402.7.3.3 (New)

Proponent: Sarah A. Rice, Schirmer Engineering Corporation

THESE PROPOSALS ARE ON THE AGENDA OF THE IBC FIRE SAFETY AND THE IBC GENERAL CODE DEVELOPMENT COMMITTEES AS 2 SEPARATE CODE CHANGES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES

PART I – IBC FIRE SAFETY

Revise as follows:

705.1.1 Party walls. Any wall located on a lot line between adjacent buildings, which is used or adapted for joint service between the two buildings, shall be constructed as a firewall in accordance with Section 705. Party walls shall be constructed without openings and shall create separate buildings.

Exception: Openings in a party wall separating an anchor building and a covered mall building shall be in accordance with Section 402.7.3.1.

PART II – IBC GENERAL

Revise as follows:

402.7.3 Anchor building separation. An anchor building shall be separated from the covered mall building by fire walls or party walls complying with Section 705.

Exception: Anchor buildings of not more than three stories above grade plane that have an occupancy classification the same as that permitted for tenants of the covered mall building shall be separated by 2-hour fire-resistive fire barriers complying with Section 706.

402.7.3.1 Openings between anchor building and mall in Types I and II construction. Except for the separation between Group R-1 sleeping units and the mall, openings ~~between~~ in the wall separating anchor buildings of Type IA, IB, IIA and IIB I or II construction and the mall need not be protected.

402.7.3.2 Openings between anchor building and mall in Types III, IV or V construction. Openings in the wall separating anchor buildings of Type III, IV or V construction and the mall shall be protected in accordance with provisions of Chapter 7 based upon the type of wall.

402.7.3.3 Openings between anchor building and covered mall buildings, other than in the mall. Openings in the wall separating anchor buildings construction and the covered mall building, in other than the mall, shall be protected in accordance with provisions of Chapter 7 based upon the type of wall.

Reason: It is becoming more common for the owner of an anchor building that is attached to a covered mall building to purchase the land upon which it sits. Once this occurs a “lot line” is created between the anchor building and the covered mall building and the fire wall that is constructed is regulated by Section 705.1.1 which prohibits the wall from having any openings.

Without openings the anchor store could not function in concert with the covered mall building as they have historically done so. The revisions proposed seek to coordinate how openings in the walls separating anchor buildings and covered mall buildings are to be addressed.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

PART I – IBC FIRE SAFETY

Committee Action:

Approved as Modified

Modify the proposal as follows:

705.1.1 Party walls. Any wall located on a lot line between adjacent buildings, which is used or adapted for joint service between the two buildings, shall be constructed as a firewall in accordance with Section 705. Party walls shall be constructed without openings and shall create separate buildings.

Exception: Openings in a party wall separating an anchor building and a covered mall building shall be in accordance with Section 402.7.3.1.

Committee Reason: The committee agreed that based on the unique situation regarding ownership of anchor buildings in typical malls this exception was appropriate to include. Further, the modification appropriately clarifies that the separation requirements are intended to address the pedestrian way within the mall building.

Assembly Action:

None

PART II – IBC GENERAL

Committee Action:

Disapproved

Committee Reason: The definition of covered mall would already address the concern of differing ownership.

Assembly Action:

None

Final Hearing Results

FS22-07/08, Part I	AM
FS22-07/08, Part II	D

Code Change No: FS26-07/08

Original Proposal

Section: 705.4

Proponent: Jerry R. Tepe, FAIA, JRT-AIA Architect, representing American Institute of Architects

Revise as follows:

**TABLE 705.4
FIRE WALL FIRE-RESISTANCE RATINGS**

(Portions of table not shown remain unchanged)

- ~~a. Walls shall be not less than 2-hour fire-resistance-rated where separating buildings of Type II or V construction.~~
- a. In Type II or V construction, walls are permitted to have a 2-hour fire-resistance-rating.
- b. For Group H-1, H-2 or H-3 buildings, also see Sections 415.4 and 415.5.

Reason: Footnote a is confusing and often not understood. Revised wording makes the intent of the footnote clearer.

Cost Impact: The code change proposal will not increase the cost of construction. Correct interpretation of the code will save costs.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The committee agreed with the proponent that current footnote "a" to Table 705.4 is confusing and often misinterpreted. The revised wording clarifies the footnote by indicated what is permitted rather than a minimum requirement.

Assembly Action:

None

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Bob Eugene, Underwriters Laboratories Inc., requests Approved as Modified by this public comment.

Modify proposal as follows:

**TABLE 705.4
FIRE WALL FIRE-RESISTANCE RATINGS**

(Portions of table not shown remain unchanged)

- a. In Type II or V construction, walls ~~are~~ shall be permitted to have a 2 hour fire-resistance-rating.
b. For Group H-1, H-2 or H3 buildings, also see Sections 415.4 and 415.5.

Commenter-s Reason: The proposed language above is intended further clarify the meaning of this footnote through the use of mandatory language.

Final Hearing Results

FS26-07/08

AMPC

Code Change No: FS29-07/08

Original Proposal

Section: 705.6

Proponent: Philip Brazil, PE, Reid Middleton, Inc., representing himself

Revise as follows:

705.6 (Supp) Vertical continuity. Fire walls shall extend from the foundation to a termination point at least 30 inches (762 mm) above both adjacent roofs.

Exceptions:

1. Stepped buildings in accordance with Section 705.6.1.
2. Two-hour fire-resistance-rated walls shall be permitted to terminate at the underside of the roof sheathing, deck or slab provided:

- 2.1. The lower roof assembly within 4 feet (1220 mm) of the wall has not less than a 1-hour fire-resistance rating and the entire length and span of supporting elements for the rated roof assembly has a fire-resistance rating of not less than 1 hour.
- 2.2. Openings in the roof shall not be located within 4 feet (1220 mm) of the fire wall.
- 2.3. Each building shall be provided with not less than a Class B roof covering.
3. Walls shall be permitted to terminate at the underside of noncombustible roof sheathing, deck, or slabs where both buildings are provided with not less than a Class B roof covering. Openings in the roof shall not be located within 4 feet (1220 mm) of the fire wall.
4. In buildings of Type III, IV and V construction, walls shall be permitted to terminate at the underside of combustible roof sheathing or decks provided:
 - 4.1. There are no openings in the roof within 4 feet (1220 mm) of the fire wall,
 - 4.2. The roof is covered with a minimum Class B roof covering, and
 - 4.3. The roof sheathing or deck is constructed of fire-retardant-treated wood for a distance of 4 feet (1220 mm) on both sides of the wall or the roof is protected with 5/8 inch (15.9 mm) Type X gypsum board directly beneath the underside of the roof sheathing or deck, supported by a minimum of 2-inch (51 mm) nominal ledgers attached to the sides of the roof framing members for a minimum distance of 4 feet (1220 mm) on both sides of the fire wall.
5. In buildings designed in accordance with Section 509.2, fire walls located above the 3 hour ~~fire-rated~~ horizontal ~~separation assembly~~ required by Section 509.2 item 1 shall be permitted to extend from the top of this horizontal ~~separation assembly~~.

Reason: The changes are proposed for consistency with the changes approved by Proposal G153-06/07-AMPC1. Note that “fire-rated” and “horizontal separation” have no technical meaning and there are no instances of their use in the 2006 IBC. “Fire-resistance rating (rated)” and “fire-protection rating (rated)” are both defined in Section 702.1 and “fire-resistance-rated” would be the technically correct replacement for “fire-rated.” Neither term, however, is necessary because “horizontal assembly” is defined in Section 702.1 as a “fire-resistance-rated floor or roof assembly of materials designed to restrict the spread of fire in which continuity is maintained.” The technical provisions of Section 711 for horizontal assemblies effectively establish them as fire containment assemblies between stories and other areas.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The committee agreed with the proponent in that consistency with the changes approved by Proposal G153-06/07 with respect to the terms “fire-rated” and “horizontal separation” was needed. G153-06/07 changed the term from horizontal separation to horizontal assembly and substantiated that all of these assemblies were by definition fire-resistance rated, therefore calling them fire-rated was not necessary in other text locations. These terms are appropriately replaced with “horizontal assembly.”

Assembly Action:

None

Final Hearing Results

FS29-07/08

AS

Code Change No: FS34-07/08

Original Proposal

Section: 706.3.9

Proponent: Gregory R. Keith, Professional heuristic Development, representing The Boeing Company

Revise as follows:

706.3.9. (Supp) ~~Single-occupancy~~ Fire areas. The fire barriers or horizontal assemblies, or both, separating a single occupancy into different fire areas shall have a fire-resistance rating of not less than that indicated in Table 706.3.9. The fire barriers or horizontal assemblies, or both, separating fire areas of mixed occupancies shall have a fire-resistance rating of not less than the highest value indicated in Table 706.3.9 for the occupancies under consideration.

Reason: Section 901.7 essentially states that when a building is divided by fire areas, that such fire areas be separated by fire barriers having a fire-resistance rating determined in accordance with Section 706.3.9. Section 706.3.9 addresses only the single occupancy design condition. Obviously, fire area provisions apply to mixed occupancy buildings as well. The added second sentence prescribes the logical fire-resistance rating requirements for mixed occupancies. This proposal will increase consistency in the application of fire area provisions by addressing a design condition, about which, the IBC is currently silent.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The committee agreed with the proponent in that this proposal will increase consistency in the application of fire area provisions by addressing fire area provisions that apply to mixed occupancy buildings, about which, the IBC is currently silent.

Assembly Action:

None

Final Hearing Results

FS34-07/08

AS

Code Change No: FS35-07/08

Original Proposal

Section: 706.5

Proponent: William Clayton, City of Westminster, CO, representing himself

Revise as follows:

706.5 (Supp) Continuity. Fire barriers shall extend from the top of the floor/ceiling assembly below to the underside of the floor or roof sheathing, slab or deck above and shall be securely attached thereto. Such fire barriers shall be continuous through concealed spaces, such as the space above a suspended ceiling. The supporting construction for a fire barrier shall be protected to afford the required fire-resistance rating of the fire barrier supported, ~~except for 1-hour fire barriers required by Table 508.2 in buildings of Type IIB, IIIB and VB construction.~~ Hollow vertical spaces within a fire barrier shall be fireblocked in accordance with Section 717.2 at every floor level.

Exceptions:

1. The maximum required fire-resistance rating for assemblies supporting fire barriers separating tank storage as provided for in Section 415.6.2.1 shall be 2 hours, but not less than required by Table 601 for the building construction type.
2. Shaft enclosures shall be permitted to terminate at a top enclosure complying with Section 707.12.
3. Supporting construction for 1-hour fire barriers required by Table 508.2 in buildings of Type IIB, IIIB, and VB construction is not required to be fire-resistance rated unless required by other sections of this code.

Reason: Section 508.2.2.1 sends the reader to Section 706.5 for the requirements for the fire-resistance rated incidental use area walls. Section 706.5 currently does not read clearly and it includes an exception within the body of the code. I have removed the exception from the body and added it as the 3rd exception. This mirrors the wording in a companion change I have submitted to Section 508.2.2.1, regarding the protection of the floors in the incidental use areas and removes the associated confusion with the current wording. Fires typically do not tend to burn downward and the floor should not be required to be fire-resistance rated unless stipulated for other reasons within the code such as for a horizontal fire barrier between occupancy types. I believe this change will simplify the process and understanding for the code user.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The committee agreed that Section 706.5 currently does not read clearly because it contains an exception within it. Removing the exception from the body and adding it as the 3rd exception is appropriate.

Assembly Action:

None

Final Hearing Results

FS35-07/08

AS

Code Change No: **FS37-07/08**

Original Proposal

Sections: 706.5, 706.5.1 (New)

Proponent: Tony Crimi, AC Consulting Solutions Inc., representing International Firestop Council

Revise as follows:

706.5 (Supp) Continuity. Fire barriers shall extend from the top of the floor/ceiling assembly below to the underside of the floor or roof sheathing, slab or deck above and shall be securely attached thereto. Such fire barriers shall be continuous through concealed spaces, such as the space above a suspended ceiling. ~~The supporting construction for a fire barrier shall be protected to afford the required fire-resistance rating of the fire barrier supported, except for 1-hour fire barriers required by Table 508.2 in buildings of Type IIB, IIIB and VB construction. Hollow vertical spaces within a fire barrier shall be fireblocked in accordance with Section 717.2 at every floor level.~~

Exceptions:

- ~~1. The maximum required fire-resistance rating for assemblies supporting fire barriers separating tank storage as provided for in Section 415.6.2.1 shall be 2 hours, but not less than required by Table 601 for the building construction type.~~
- ~~2. Shaft enclosures shall be permitted to terminate at a top enclosure complying with Section 707.12.~~

706.5.1 Supporting Construction. The supporting construction for a fire barrier shall be protected to afford the required fire-resistance rating of the fire barrier supported, except for 1-hour fire barriers required by Table 508.2 in buildings of Type IIB, IIIB and VB construction. Hollow vertical spaces within a fire barrier shall be fireblocked in accordance with Section 717.2 at every floor level.

Exceptions:

1. The maximum required fire-resistance rating for assemblies supporting fire barriers separating tank storage as provided for in Section 415.6.2.1 shall be 2 hours, but not less than required by Table 601 for the building construction type.
2. Shaft enclosures shall be permitted to terminate at a top enclosure complying with Section 707.12.

706.9 Joints. Joints made in or between fire barriers, and joints made at the intersection of fire barriers with underside of the floor or roof sheathing, slab or deck above shall comply with Section 713.

Reason: The purpose of this proposed Code change is to simplify section 706.5 and clarify that the fire-resistant joint installed at the intersection of the top of a rated vertical fire barrier and a horizontal roof, floor, or roof slab is required in order to provide the continuity of fire barriers.

As currently written, the Code requirement mixes three different concepts in section 706.5, and then further complicates the issue by adding an exception for certain incidental use areas, making it difficult to discern the requirements. The existing section mixes the notion of “continuity” with that of establishing the fire resistance rating of the supporting construction. In doing so, it clouds the issue of the required rating for the joint located at the top of the fire barrier wall.

With the revisions introduced into the 2006 IBC to the application of fire barriers, the requirement to provide continuity at the top of fire barrier walls has been made more confusing. The 2003 IBC contained the same language in 706.9 regarding “joints made in or between fire barriers”. However, by limiting the definition of fire barriers to walls, the previous requirement to protect joints at the intersection of vertical fire barriers and horizontal construction has been subverted. The revised definition of a Fire Barrier in 702.1 does make it clear that fire barriers are required to maintain continuity, but section 706 requires clarification.

This proposed change separates the requirements for the continuity of the vertical fire barrier from the requirement for the fire resistance ratings of the supporting construction. The fire-resistant joint located at the intersection of the top of a vertical fire barrier wall and the bottom of a fire resistance rated or non-fire resistance rated horizontal roof assembly, floor assembly, or roof slab is a vertical extension of the fire barrier wall and is therefore required to have a fire resistance rating equal to that of the wall assembly. This issue is distinct from whether or not the supporting construction is required to have a fire resistance rating or not. It is directly analogous to the horizontal condition where the fire resistant joint is considered an extension of the rated horizontal assembly. This principle is historically well established in the model Codes, and is similar to the way in which exterior curtain wall and floor intersections are handled in section 713.4.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The committee agreed that this was an appropriate reorganization of Section 706.5 to separate the supporting construction requirements from the continuity requirements as well as to clarify that the fire-resistant joint installed at the intersection of the top of a rated vertical fire barrier and a horizontal roof, floor, or roof slab is required in order to provide the continuity of fire barriers.

Assembly Action:

None

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Lori Lee Graham, City of Portland, OR, representing self requests Approved as Modified by this public comment.

Modify proposal as follows:

706.5.1 Supporting construction: The supporting construction for a fire barrier shall be protected to afford the required fire-resistance rating of the fire barrier supported ~~except for 1-hour fire barriers required by Table 508.2 in buildings of Type IIB, IIIB and VB construction.~~ Hollow vertical spaces within a fire barrier shall be fireblocked in accordance with Section 717.2 at every floor level.

Exceptions:

1. The maximum required fire-resistance rating for assemblies supporting fire barriers separating tank storage as provided for in Section 415.6.2.1 shall be 2 hours, but not less than required by Table 601 for the building construction type.
2. Shaft enclosures shall be permitted to terminate at a top enclosure complying with Section 707.12.
3. Supporting construction for 1-hour fire barriers required by Table 508.2 in buildings of Type IIB, IIIB, and VB construction is not required to be fire-resistance rated unless required by other sections of this code.

(Portions of proposal not shown remain unchanged)

Commenter's Reason: The intent of Public Comment is editorial. The proposed Section 706.5.1 as approved by the committee has 3 exceptions – 2 after the paragraph – 1 in the paragraph. This public comment will simply make them all as listed exceptions.

Final Hearing Results

FS37-07/08

AMPC

Code Change No: **FS38-07/08**

Original Proposal

Section: 707.1

Proponent: Douglas H. Evans, PE, Clark County, NV, representing the Department of Development Services

Revise as follows:

707.1 General. The provisions of this section shall apply to ~~vertical shafts where such shafts are~~ required to protect openings and penetrations through floor/ceiling and roof/ceiling assemblies. Shaft enclosures shall be constructed as fire barriers in accordance with Section 706 or horizontal assemblies in accordance with Section 711, or both.

Reason: The revision clarifies that shafts may be installed horizontally, as well as vertically, and removes other unnecessary wording. No change intended to code requirements.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The committee agreed with the proponent in that the proposal clarifies that shafts may be installed horizontally, as well as vertically.

Assembly Action:

None

Final Hearing Results

FS38-07/08

AS

Code Change No: **FS40-07/08**

Original Proposal

Section: 707.2

Proponent: Lori Lee Graham, City of Portland, OR

Revise as follows:

707.2 (Supp) Shaft enclosure required. Openings through a floor/ceiling assembly shall be protected by a shaft enclosure complying with this Section.

Exceptions:

1. through 6. (No change to current text)
7. In other than Groups I-2 and I-3, a shaft enclosure is not required for a floor opening or an air transfer opening that complies with the following:
 - 7.1. Does not connect more than two stories.
 - 7.2. Is not part of the required means of egress system, except as permitted in Section 1020.1.
 - 7.3. Is not concealed within the ~~building~~ construction of a wall or a floor/ceiling assembly.
 - 7.4. Is not open to a corridor in Group I and R occupancies.

- 7.5. Is not open to a corridor on nonsprinklered floors in any occupancy.
- 7.6. Is separated from floor openings and air transfer openings serving other floors by construction conforming to required shaft enclosures.
- 7.7. Is limited to the same smoke compartment.

(Exceptions not shown remain unchanged)

Reason: Item 7.3 of this exception prohibits the use of the exception if the opening is “concealed within the building construction”. Interpretation of this item has varied with respect to whether the exception would allow an elevator to connect 2 stories without being in a shaft. The difference in interpretation of what is “concealed within the construction of the building”. In most places in the code when something is concealed, it is usually referring to cavities within an assembly or beneath a floor or in an attic. But other places of the code talk about concealed spaces and the reference is to a small closet or storage area.

We believe that it is appropriate to clarify which type of concealed space this exception is addressing. As currently written, it could be interpreted that an elevator would not be allowed to utilize the exception. The concern about limiting this exception to not allow concealed spaces is that if a fire is occurring in the concealed space, it won't be observable. An elevator, even within a unrated hoistway is readily observable, it is not 'concealed' in the construction.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The committee agreed that this proposal clarified the term “construction” with respect to exception 7 to Section 707.2. This clarification is required because in some locations in the code concealed refers to cavities within an assembly or beneath a floor or in an attic; however in other portions of the code “concealed spaces” is used in reference to small closet or storage areas.

Assembly Action:

None

Final Hearing Results

FS40-07/08

AS

Code Change No: FS41-07/08

Original Proposal

Section: 707.2

Proponent: Masoud Sabounchi, PE, CBO, Advanced Counseling Engineers, Inc., representing Colorado Chapter ICC

Revise as follows:

707.2 (Supp) Shaft enclosure required. Openings through a floor/ceiling assembly shall be protected by a shaft enclosure complying with this Section.

Exceptions:

1. A shaft enclosure is not required for openings totally within an individual residential dwelling unit and connecting four stories or less.
2. A shaft enclosure is not required in a building equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 for an escalator opening or stairway that is not a portion of the means of egress protected according to Item 2.1 or 2.2:
 - 2.1. Where the area of the floor opening between stories does not exceed twice the horizontal projected area of the escalator or stairway and the opening is protected by a draft curtain and closely spaced sprinklers in accordance with NFPA 13. In other than Groups B and M, this application is limited to openings that do not connect more than four stories.

- 2.2. Where the opening is protected by approved power-operated automatic shutters at every penetrated floor. The shutters shall be of noncombustible construction and have a fire-resistance rating of not less than 1.5 hours. The shutter shall be so constructed as to close immediately upon the actuation of a smoke detector installed in accordance with Section 907.11 and shall completely shut off the well opening. Escalators shall cease operation when the shutter begins to close. The shutter shall operate at a speed of not more than 30 feet per minute (152.4 mm/s) and shall be equipped with a sensitive leading edge to arrest its progress where in contact with any obstacle, and to continue its progress on release there from.
3. A shaft enclosure is not required for penetrations by pipe, tube, conduit, wire, cable and vents protected in accordance with Section 712.4.
4. A shaft enclosure is not required for penetrations by ducts protected in accordance with Section 712.4. Grease ducts shall be protected in accordance with the *International Mechanical Code*.
5. In other than Group H occupancies, a shaft enclosure is not required for floor openings complying with the provisions for atriums in Section 404.
6. A shaft enclosure is not required for approved masonry chimneys where annular space protection is provided at each floor level in accordance with Section 717.2.5.
7. In other than Groups I-2 and I-3, a shaft enclosure is not required for a floor opening or an air transfer opening that complies with the following:
 - 7.1. Does not connect more than two stories.
 - 7.2. Is not part of the required means of egress system, except as permitted in Section 1020.1.
 - 7.3. Is not concealed within the building construction.
 - 7.4. Is not open to a corridor in Group I and R occupancies.
 - 7.5. Is not open to a corridor on nonsprinklered floors in any occupancy.
 - 7.6. Is separated from floor openings and air transfer openings serving other floors by construction conforming to required shaft enclosures.
 - 7.7. Is limited to the same smoke compartment.
8. A shaft enclosure is not required for automobile ramps in open and enclosed parking garages constructed in accordance with Sections 406.3 and 406.4, respectively.
9. A shaft enclosure is not required for floor openings between a mezzanine and the floor below.
10. A shaft enclosure is not required for joints protected by a fire-resistant joint system in accordance with Section 713.
11. A shaft enclosure shall not be required for floor openings created by unenclosed stairs or ramps in accordance with Exception 8 or 9 in Section 1020.1.
12. Floor openings protected by floor fire doors in accordance with Section 711.8.
13. Where permitted by other sections of this code.
14. Elevator hoistways in open or enclosed parking garages that serve only the parking garage are not required to be of fire resistance rated construction enclosed.
15. In open or enclosed parking garages a shaft enclosure is not required to enclose mechanical exhaust or supply duct systems when such duct system is contained within and serves only the parking garage.

Reason: IBC Section 707.2 Exception 8 does not require a shaft enclosure at automobile ramps in open or enclosed parking garages. Section 716.5.3 exceptions 1.4 and 3 do not require fire or smoke dampers at supply or exhaust ducts of shafts enclosures serving parking garages. Size of openings for exhaust and supply shafts is not limited. Providing a fire resistance shaft enclosure for mechanical exhaust and supply ducts, or the elevator hoistways in garages where ramps are open at all levels does not provide additional protection. This proposal is for elevator and mechanical supply and exhaust enclosures contained within and serving the garage only.

Cost Impact: The code change proposal will not increase the cost of construction. The code change proposal reduces the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The committee agreed with the proponent. Since Section 707.2 Exception 8 does not require a shaft enclosure at automobile ramps in open or enclosed parking garages, and Section 716.5.3, exceptions 1.4 and 3 do not require fire or smoke dampers at supply or exhaust ducts of shafts enclosures serving parking garages, a fire resistance shaft enclosure for mechanical exhaust and supply ducts, or the elevator hoistways in garages where ramps are open at all levels should not be required.

Assembly Action:

None

Final Hearing Results

FS41-07/08

AS

Code Change No: **FS43-07/08**

Original Proposal

Section: 707.4

Proponent: Douglas H. Evans, PE, Clark County Department of Development Services, NV

Revise as follows:

707.4 Fire-resistance rating. Shaft enclosures shall have a fire-resistance rating of not less than 2 hours where connecting four stories or more, and not less than 1 hour where connecting less than four stories. The number of stories connected by the shaft enclosure shall include any basements but not any mezzanines. Shaft enclosures shall have a fire-resistance rating not less than the floor assembly penetrated, but need not exceed 2 hours. Shaft enclosures shall meet the requirements of Section 703.2.1.

Reason: This revision clarifies that shafts are intended to be symmetrical assemblies, or are to be assigned the rating of the least fire-resistance rated side. If one follows the code path, this level of protection is already required, but it is not completely clear. This revision does not require the exterior side of shafts on exterior walls to be rated, as both Section 703.2.1 and 707.6 refer to Section 704.5, which regulates exterior walls/shafts based on proximity to property lines. No change is intended to code requirements.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The committee agreed that this revision clarifies that shafts are intended to be symmetrical assemblies, or are to be assigned the rating of the least fire-resistance rated side.

Assembly Action:

None

Final Hearing Results

FS43-07/08

AS

Code Change No: **FS49-07/08**

Original Proposal

Section: 707.14.1

Proponent: Gregory Lake, Sacramento Metropolitan Fire District, representing California Fire Chief's Association (Cal Chiefs)

Revise as follows:

707.14.1 (Supp) Elevator lobby. An enclosed elevator lobby shall be provided at each ~~floor story~~ where an elevator shaft enclosure connects more than three stories. The lobby enclosure shall separate the elevator shaft enclosure doors from each ~~floor story~~ by fire partitions ~~equal to the fire-resistance rating of the corridor and the required opening protection.~~ In addition to the requirements in Section 708 for fire partitions, doors protecting openings in the elevator lobby enclosure walls shall also comply with Section 715.4.3 as required for corridor walls and penetrations of the elevator lobby enclosure by ducts and air transfer openings shall be protected as required for corridors in accordance with Section 716.5.4.1. Elevator lobbies shall have at least one means of egress complying with Chapter 10 and other provisions within this code.

Exceptions:

1. Enclosed elevator lobbies are not required at the street floor, provided the entire street floor is equipped with an automatic sprinkler system in accordance with Section 903.3.1.1.
2. Elevators not required to be located in a shaft in accordance with Section 707.2 are not required to have enclosed elevator lobbies.
3. Where additional doors are provided at the hoistway opening in accordance with Section 3002.6. Such doors shall be tested in accordance with UL 1784 without an artificial bottom seal.
4. In other than Group I-2 and I-3, and buildings having occupied floors located more than 75 feet (22 860 mm) above the lowest level of fire department vehicle access, enclosed elevator lobbies are not required where the building is protected by an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2.
5. Smoke partitions shall be permitted in lieu of fire partitions to separate the elevator lobby at each floor where the building is equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2.
6. Enclosed elevator lobbies are not required where the elevator hoistway is pressurized in accordance with Section 707.14.2.

Reason: The purpose of this code change proposal is to clarify the requirements for the construction of the elevator lobby enclosure when it is required by this section. Currently the code is not entirely clear as to how to apply the construction requirements for elevator lobby enclosures since it requires the elevator lobby enclosures to be “fire partitions equal to the fire resistance rating of the corridor and the required opening protection.” This causes problems especially when the building may be sprinklered and the corridor is not required to have a fire resistance rating by Table 1017.1 or because of one of the Exceptions to Section 1017.1. The condition where the corridor may not have a fire resistance rating because the building is protected with an automatic sprinkler system is currently addressed by Exception 5 which allows the elevator lobby enclosure to be constructed as a smoke partition.

Therefore, we believe the key issue is how the opening protection is to be accomplished for the elevator lobby enclosure when the fire partition has a one hour fire resistance rating as required for corridors in nonsprinklered buildings. We believe it is more clear to provide the specific reference to the Sections that incorporate additional specific protection requirements for door openings and duct and air transfer openings in corridor walls to protect against the passage of smoke which is critical in elevator lobby enclosures. So we provided a specific reference for door opening protectives to Section 715.4.3 Door Assemblies in Corridors and Smoke Barriers which specifies the requirement for smoke leakage testing for smoke and draft control doors as required for corridors. We have also provided a specific reference to Section 716.5.4.1 for Ducts and Air Transfer Openings in the elevator enclosures walls which specifies a requirement for a smoke damper in corridor walls at such openings.

In summary, it is our opinion that this is an editorial change without technical revisions with clarifications to make the application and use of this Section more user friendly and easier to enforce.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Modified

Modify the proposal as follows:

707.14.1 (Supp) Elevator lobby. An enclosed elevator lobby shall be provided at each floor story where an elevator shaft enclosure connects more than three stories. The lobby enclosure shall separate the elevator shaft enclosure doors from each floor story by fire partitions. In addition to the requirements in Section 708 for fire partitions, doors protecting openings in the elevator lobby enclosure walls shall also comply with Section 715.4.3 as required for corridor walls and penetrations of the elevator lobby enclosure by ducts and air transfer openings shall be protected as required for corridors in accordance with Section 716.5.4.1. Elevator lobbies shall have at least one means of egress complying with Chapter 10 and other provisions within this code.

(Portions of proposal not shown remain unchanged)

Committee Reason: The committee agreed with the proponent in that this code change proposal clarifies the requirements for the construction of the elevator lobby enclosure when this section requires it; with respect to doors, ducts and air transfer openings. The modification changed “story” back to “floor” which is consistent with current code terminology.

Assembly Action:

None

Final Hearing Results

FS49-07/08

AM

Code Change No: FS53-07/08

Original Proposal

Section: 707.14.1

Proponent: Gregory Lake, Sacramento Metropolitan Fire District, representing California Fire Chief's Association (Cal Chiefs)

Revise as follows:

707.14.1 (Supp) Elevator lobby. An enclosed elevator lobby shall be provided at each floor where an elevator shaft enclosure connects more than three stories. The lobby shall separate the elevator shaft enclosure doors from each floor by fire partitions equal to the fire-resistance rating of the corridor and the required opening protection. Elevator lobbies shall have at least one means of egress complying with Chapter 10 and other provisions within this code.

Exceptions:

1. Enclosed elevator lobbies are not required at the street floor, provided the entire street floor is equipped with an automatic sprinkler system in accordance with Section 903.3.1.1.
2. Elevators not required to be located in a shaft in accordance with Section 707.2 are not required to have enclosed elevator lobbies.
3. Where additional doors are provided at the hoistway opening in accordance with Section 3002.6. Such doors shall be tested in accordance with UL 1784 without an artificial bottom seal.
4. ~~In other than Group I-2 and I-3, and buildings having occupied floors located more than 75 feet (22 860 mm) above the lowest level of fire department vehicle access, enclosed~~ Enclosed elevator lobbies are not required where the building is protected by an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2. This exception shall not apply to the following:
 - 4.1. I-2 buildings,
 - 4.2. Group I-3 buildings,
 - 4.3. Buildings having occupied floors located more than 75 feet (22 860 mm) above the lowest level of fire department vehicle access, and
 - 4.4. Buildings in Seismic Design Category D, E, or F.
5. Smoke partitions shall be permitted in lieu of fire partitions to separate the elevator lobby at each floor where the building is equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2.
6. Enclosed elevator lobbies are not required where the elevator hoistway is pressurized in accordance with Section 707.14.2.

Reason: This proposed code change accomplishes two things. First, it reformats this very complicated Exception to make it easier to understand and apply. Second, it provides an additional criterion for when the Exception does not apply for buildings determined to be in seismic design category D, E, or F.

As we have begun to review the code to become more familiar with it so that we can begin to enforce it with our recent adoption to become effective on January 1, 2008, we have struggled with how to interpret and properly apply Exception 4 which actually starts out as a double negative. We believe the reformatting we have proposed clarifies that the Exception is not intended to apply to Group I-2 and Group I-3 buildings, as well as high rise buildings that comply with Section 403. So we do not believe that the proposed reformatting makes any technical changes.

But we also realize that this Section also in essence allows for the omission of elevator lobbies when they would otherwise be required if the buildings are protected throughout with an NFPA 13 or an NFPA 13R automatic sprinkler system. We have serious concerns about the application of that Exception especially in our part of the country where we are subject to rather severe earthquakes. We know that we can expect a loss of water supplies not only to buildings but to fire hydrants as well for extended periods of time, thus rendering the automatic sprinkler system inoperable and denying us adequate water supplies to fight the multiple fires that will occur after a significant seismic event. Since migration through elevator shafts has been well documented, we believe that a sprinkler exception should not be applied to those cases where the building has been determined to be in a seismic design category D, E, or F. These seismic design categories are also similar to those specified in Section 903.3.5.2 Secondary Water Supply. That Section requires an onsite water supply for high rise buildings that are in seismic design categories C, D, E, or F. We have chosen to delete the reference to seismic design category C because it has an impact on some other parts of the country where earthquakes may not be as severe or as frequent as they are in California and other regions of the west coast.

By implementing this code change we will be able to continue to enforce the requirement for elevator lobbies which has been in our legacy code, the ICBO Uniform Building Code (UBC), for many years. Our experience has found that the elevator lobby enclosures do help to minimize the spread of smoke from floor to floor via elevator shafts, thus helping the fire department to do their job much more effectively and to minimize smoke exposure to occupants on floors remote from the fire floor and to minimize property damage and subsequent clean up and removal of residual smoke from the building. We believe this is important to fire and life safety feature which provides basic smoke protection and should not be traded off for an automatic sprinkler system, especially in locations where a significant seismic event could render the sprinkler system totally inoperable. Therefore, we respectfully request the Committee approve this code change proposal.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The committee had a concern with the term “buildings” in Items 4.1 and 4.2; they thought “occupancies” was a better fit. Further, there was no technical justification for not allowing buildings in certain seismic design categories from benefiting from this exception.

Assembly Action:

None

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Mike Ashley, Alliance for Fire and Smoke Containment and Control (AFSCC) requests Approved as Modified by this public comment.

Modify proposal as follows:

707.14.1 (Supp) Elevator lobby. An enclosed elevator lobby shall be provided at each floor where an elevator shaft enclosure connects more than three stories. The lobby shall separate the elevator shaft enclosure doors from each floor by fire partitions equal to the fire-resistance rating of the corridor and the required opening protection. Elevator lobbies shall have at least one means of egress complying with Chapter 10 and other provisions within this code.

Exceptions:

1. Enclosed elevator lobbies are not required at the street floor, provided the entire street floor is equipped with an automatic sprinkler system in accordance with Section 903.3.1.1.
2. Elevators not required to be located in a shaft in accordance with Section 707.2 are not required to have enclosed elevator lobbies.
3. Where additional doors are provided at the hoistway opening in accordance with Section 3002.6. Such doors shall be tested in accordance with UL 1784 without an artificial bottom seal.
4. Enclosed elevator lobbies are not required where the building is protected by an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2. This exception shall not apply to the following:
 - 4.1. ~~Group I-2 buildings occupancies.~~
 - 4.2. ~~Group I-3 buildings occupancies, and~~
 - 4.3. Buildings having occupied floors located more than 75 feet (22 860 mm) above the lowest level of fire department vehicle access, ~~and,~~
 - 4.4. ~~Buildings in Seismic Design Category D, E, or F.~~
5. Smoke partitions shall be permitted in lieu of fire partitions to separate the elevator lobby at each floor where the building is equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2.
6. Enclosed elevator lobbies are not required where the elevator hoistway is pressurized in accordance with Section 707.14.2.

Commenter’s Reason: Based on the revisions proposed by this Public Comment, this code change proposal no longer contains any technical changes to Exception 4 to Section 707.14.1 (Supp) Elevator Lobby. We have deleted Item 4.4 of the Exception which the Committee objected to as not being technically justified regarding buildings in Seismic Design Categories D, E, or F. We’ve also made an editorial revision to the references to the term “buildings” and changed them to “occupancies” in both Items 4.1 and 4.2 of Exception 4 to also respond to the Committee comments on their recommendation for disapproval of this code change. The result is an editorial reformatting of Exception 4 to help clarify its application and interpretation. We believe that this reformatting is superior to the current Exception which is very confusing and subject to varying interpretations as to how it is intended to apply to enclosed elevator lobby requirements. We believe that once this Exception is clarified, then it may be easier to further modify it to address technical issues related to how this Exception should apply in various buildings where automatic sprinkler systems are provided in order to eliminate the requirement for an enclosed elevator lobby.

Final Hearing Results

FS53-07/08

AMPC

Code Change No: **FS56-07/08**

Original Proposal

Section: 707.14.1

Proponent: Gregory Lake, Sacramento Metropolitan Fire District, representing California Fire Chief's Association (Cal Chiefs)

Revise as follows:

707.14.1 (Supp) Elevator lobby. An enclosed elevator lobby shall be provided at each floor where an elevator shaft enclosure connects more than three stories. The lobby shall separate the elevator shaft enclosure doors from each floor by fire partitions equal to the fire-resistance rating of the corridor and the required opening protection. Elevator lobbies shall have at least one means of egress complying with Chapter 10 and other provisions within this code.

Exceptions:

1. Enclosed elevator lobbies are not required at the street floor, provided the entire street floor is equipped with an automatic sprinkler system in accordance with Section 903.3.1.1.
2. Elevators not required to be located in a shaft in accordance with Section 707.2 are not required to have enclosed elevator lobbies.
3. Where additional doors are provided at the hoistway opening in accordance with Section 3002.6. Such doors shall be tested in accordance with UL 1784 without an artificial bottom seal.
4. In other than Group I-2 and I-3, and buildings having occupied floors located more than 75 feet (22 860 mm) above the lowest level of fire department vehicle access, enclosed elevator lobbies are not required where the building is protected by an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2.
5. Smoke partitions shall be permitted in lieu of fire partitions to separate the elevator lobby at each floor where the building is equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2. In addition to the requirements in Section 710 for smoke partitions, doors protecting openings in the smoke partitions shall also comply with Sections 710.5.2, 710.5.3, and 715.4.7 and duct penetrations of the smoke partitions shall be protected as required for corridors in accordance with Section 716.5.4.1.
6. Enclosed elevator lobbies are not required where the elevator hoistway is pressurized in accordance with Section 707.14.2.

Reason: This code change clarifies requirements where smoke partitions are used in lieu of fire partitions to separate the elevator lobby from each floor when the building is equipped with an automatic sprinkler system. Current code language requires additional requirements for door openings in smoke partitions for specific uses in Section 710.5.2 and 710.5.3. However, they only apply where "required elsewhere in the code". There are currently no specific requirements that specify those door components for an effective barrier to limit the spread of smoke from an elevator lobby shaft into a floor when an automatic sprinkler system is installed. Furthermore, Section 710.7 does not require a smoke damper to protect duct penetrations of smoke partitions, although it does require smoke dampers to protect air transfer openings. This code change will incorporate the needed smoke spread protection requirements for these door and duct openings in smoke partitions regardless of the installation of an automatic sprinkler system. We believe these additional protection features for the door openings and duct openings in these elevator lobby enclosure walls constructed of smoke partitions are essential to maintaining the primary function of the enclosures to limit the spread of smoke from floor to floor via the elevator shaft. Even in a sprinklered building we believe it is important that the doors in the smoke partitions be self-closing and latching to prevent smoke migration out of the elevator lobby or into the elevator lobby and to provide a smoke damper for duct openings in order to prevent smoke migration through the duct. Without these additional protection features, significant quantities of smoke may still be able to move throughout the building via the elevator shafts even with the installation of smoke partitions for the elevator lobby enclosures in sprinklered buildings.

It should also be noted that Exception 5 would be allowed to be applied to high rise buildings. For those buildings we believe this additional clarification on openings in smoke partitions is essential since the stack effect will be significantly more prevalent. It has been well documented that the stack effect in high rise buildings can cause significant smoke spread to floors remote from the fire floor via the elevator shafts where the elevator hoist way doors are so loose fitting that smoke can pass around their edges and migrate into the elevator shaft and then out again on floors remote from the fire floor. For these additional protection features for the doors and ducts penetrating these smoke partitions we believe the costs associated with them are insignificant compared to the benefit provided.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The committee agreed that this code change will incorporate the needed smoke spread protection requirements for door and duct openings in smoke partitions that are allowed as a replacement for fire partitions as elevator lobby enclosures in accordance with exception #5 to Section 707.14.1.

Assembly Action:

None

Final Hearing Results

FS56-07/08

AS

Code Change No: FS58-07/08

Original Proposal

Section: 707.14.1

Proponent: John Berry, Cole + Russell Architects, Inc.

Revise as follows:

707.14.1 (Supp) Elevator lobby. An enclosed elevator lobby shall be provided at each floor where an elevator shaft enclosure connects more than three stories. The lobby shall separate the elevator shaft enclosure doors from each floor by fire partitions equal to the fire-resistance rating of the corridor and the required opening protection. Elevator lobbies shall have at least one means of egress complying with Chapter 10 and other provisions within this code.

Exceptions:

1. Enclosed elevator lobbies are not required at the street floor, provided the entire street floor is equipped with an automatic sprinkler system in accordance with Section 903.3.1.1.
2. Elevators not required to be located in a shaft in accordance with Section 707.2 are not required to have enclosed elevator lobbies.
3. Where additional doors are provided at the hoistway opening in accordance with Section 3002.6. Such doors shall be tested in accordance with UL 1784 without an artificial bottom seal.
4. In other than Group I-2 and I-3, and buildings having occupied floors located more than 75 feet (22 860 mm) above the lowest level of fire department vehicle access, enclosed elevator lobbies are not required where the building is protected by an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2.
5. Smoke partitions shall be permitted in lieu of fire partitions to separate the elevator lobby at each floor where the building is equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2.
6. Enclosed elevator lobbies are not required where the elevator hoistway is pressurized in accordance with Section 707.14.2.
7. Enclosed elevator lobbies are not required in open parking garages in accordance with Section 406.3

Reason: The current code language requires elevator lobbies to be provided, where applicable, in open parking garages. Considering that the primary purpose of an elevator lobby is to inhibit the spread of smoke via the elevator hoistway, it is impractical to require an elevator lobby in an open structure that will allow smoke to dissipate outside of the building.

Although elevator lobbies are different from areas of refuge, they are similar. It is appropriate to consider that Section 1007.4 excludes elevators from being accessed from an area of refuge in an open parking garage.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Modified

Modify the proposal as follows:

707.14.1 (Supp) Elevator lobby. An enclosed elevator lobby shall be provided at each floor where an elevator shaft enclosure connects more than three stories. The lobby shall separate the elevator shaft enclosure doors from each floor by fire partitions equal to the fire-resistance rating of the corridor and the required opening protection. Elevator lobbies shall have at least one means of egress complying with Chapter 10 and other provisions within this code.

Exceptions:

1. Enclosed elevator lobbies are not required at the street floor, provided the entire street floor is equipped with an automatic sprinkler system in accordance with Section 903.3.1.1.
2. Elevators not required to be located in a shaft in accordance with Section 707.2 are not required to have enclosed elevator lobbies.
3. Where additional doors are provided at the hoistway opening in accordance with Section 3002.6. Such doors shall be tested in accordance with UL 1784 without an artificial bottom seal
4. In other than Group I-2 and I-3, and buildings having occupied floors located more than 75 feet (22 860 mm) above the lowest level of fire department vehicle access, enclosed elevator lobbies are not required where the building is protected by an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2.
5. Smoke partitions shall be permitted in lieu of fire partitions to separate the elevator lobby at each floor where the building is equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2.
6. Enclosed elevator lobbies are not required where the elevator hoistway is pressurized in accordance with Section 707.14.2.
7. Enclosed elevator lobbies are not required ~~in~~ where the elevator serves only open parking garages in accordance with Section 406.3.

Committee Reason: The committee agreed that since the primary purpose of an elevator lobby is to inhibit the spread of smoke via the elevator hoistway, it is impractical to require an elevator lobby in an open structure that will allow smoke to dissipate outside of the building. Further, the modification makes it clear that the exception is limited to elevators that serve only an open parking garage.

Assembly Action:

None

Final Hearing Results

FS58-07/08

AM

Code Change No: **FS60-07/08**

Original Proposal

Sections: 707.14.1, 707.14.1.1 (New)

Proponent: Maureen Traxler, City of Seattle, WA, representing Washington Association of Building Officials
Technical Code Development Committee

Add new text as follows:

707.14.1 (Supp) Elevator lobby. An enclosed elevator lobby shall be provided at each floor where an elevator shaft enclosure connects more than three stories. The lobby shall separate the elevator shaft enclosure doors from each floor by fire partitions equal to the fire-resistance rating of the corridor and the required opening protection. Elevator lobbies shall have at least one means of egress complying with Chapter 10 and other provisions within this code.

Exceptions:

1. Enclosed elevator lobbies are not required at the street floor, provided the entire street floor is equipped with an automatic sprinkler system in accordance with Section 903.3.1.1.
2. Elevators not required to be located in a shaft in accordance with Section 707.2 are not required to have enclosed elevator lobbies.
3. Where additional doors are provided at the hoistway opening in accordance with Section 3002.6. Such doors shall be tested in accordance with UL 1784 without an artificial bottom seal.

4. In other than Group I-2 and I-3, and buildings having occupied floors located more than 75 feet (22 860 mm) above the lowest level of fire department vehicle access, enclosed elevator lobbies are not required where the building is protected by an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2.
5. Smoke partitions shall be permitted in lieu of fire partitions to separate the elevator lobby at each floor where the building is equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2.
6. Enclosed elevator lobbies are not required where the elevator hoistway is pressurized in accordance with Section 707.14.2.

707.14.1.1 Areas of refuge. Areas of refuge shall be provided as required in Section 1007.

Reason: This proposal clarifies that, regardless of Section 707.14's exceptions for elevator lobbies, areas of refuge are governed by Section 1007. This clarification is needed because lobbies have significant consequences for building design. If, as frequently happens, the designer mistakenly interprets Section 707.14 as eliminating all requirements for lobbies at elevators, it is extremely difficult to add them to the building design later.

Cost Impact: This code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The committee agreed that this proposal clarifies that, although Section 707.14 deals with elevator lobbies and the exceptions for elevator lobbies, areas of refuge are governed by Section 1007, both of which may affect building design.

Assembly Action:

None

Final Hearing Results

FS60-07/08

AS

Code Change No: FS67-07/08

Original Proposal

Sections: 707.14.1, 707.14.2, 707.14.2.1, 909.21 (New)

Proponent: Maureen Traxler, City of Seattle, WA, representing Department of Planning & Development; John H. Klote, John H. Klote, Inc.; Douglas H. Evans, Clark County, NV, representing Department of Development Services; Assistant Chief Kenneth L. Tipler, Fire Marshall, City of Seattle, WA, representing Seattle Fire Department

1. Revise as follows:

707.14.1 (Supp) Elevator lobby. An enclosed elevator lobby shall be provided at each floor where an elevator shaft enclosure connects more than three stories. The lobby shall separate the elevator shaft enclosure doors from each floor by fire partitions equal to the fire-resistance rating of the corridor and the required opening protection. Elevator lobbies shall have at least one means of egress complying with Chapter 10 and other provisions within this code.

Exceptions:

1. Enclosed elevator lobbies are not required at the street floor, provided the entire street floor is equipped with an automatic sprinkler system in accordance with Section 903.3.1.1.
2. Elevators not required to be located in a shaft in accordance with Section 707.2 are not required to have enclosed elevator lobbies.
3. Where additional doors are provided at the hoistway opening in accordance with Section 3002.6. Such doors shall be tested in accordance with UL 1784 without an artificial bottom seal.

4. In other than Group I-2 and I-3, and buildings having occupied floors located more than 75 feet (22 860 mm) above the lowest level of fire department vehicle access, enclosed elevator lobbies are not required where the building is protected by an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2.
5. Smoke partitions shall be permitted in lieu of fire partitions to separate the elevator lobby at each floor where the building is equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2.
6. Enclosed elevator lobbies are not required where the elevator hoistway is pressurized in accordance with Section 707.14.2 909.21.

2. Delete without substitution:

~~**707.14.2 Enclosed elevator lobby pressurization alternative.** Where elevator hoistway pressurization is provided in lieu of required enclosed elevator lobbies, the pressurization system shall comply with this section.~~

~~**707.14.2.1 Pressurization requirements.** Elevator hoistways shall be pressurized to maintain a minimum positive pressure of 0.04 inches of water column (1.0 Pa) and a maximum positive pressure of 0.06 inches of water column (1.49 Pa) with respect to adjacent occupied space on all floors. This pressure shall be measured at the midpoint of each hoistway door, with all ground floor level hoistway doors open and all other hoistway doors closed. The supply air intake shall be from an outside, uncontaminated source located a minimum distance of 20 feet (6096 mm) from any air exhaust system or outlet.~~

3. Add new text as follows:

909.21 Elevator shaft pressurization. Where elevator hoistway pressurization is provided in lieu of required enclosed elevator lobbies as allowed by 707.14.1 exception 6, the pressurization system shall maintain a minimum positive pressure of 0.10 inches of water (25 Pa) and a maximum positive pressure of 0.35 inches of water (87 Pa) in the elevator hoistway relative to the building measured with all elevator doors closed under maximum anticipated conditions of stack effect and wind effect.

Reason: This proposal has two objectives—it relocates the provisions for elevator hoistway pressurization to Section 909, and it changes the required pressure difference to a range of 0.10 to 0.35 instead of the current range of 0.04 to 0.06. The purpose of the proposal is to establish criteria for pressurization systems that will control smoke under actual fire conditions.

Elevator pressurization is a smoke control system in that it is intended to control the movement of smoke. The proposed change moves elevator pressurization to Section 909 so that it is subject to the requirements of Section 909 like other smoke control systems including stairway pressurization. These requirements include rational analysis, equipment, electrical power systems, detection, control, fire-fighter's smoke control panel, special inspection and testing. It provides consistency with the requirements for stairway pressurization. Consistency is important because, in buildings that have both elevator and stair pressurization, the systems will interact with each other, making proper design analysis per Section 909.4 especially important.

Currently IBC Section 707.14.2.1 specifies a minimum pressure difference of 0.04 inches of water and a maximum pressure difference of 0.06 inches of water. There are two problems with these values. First, 0.04 inches of water is not enough to reliably keep smoke out of the hoistway. It could provide some protection from smoke migration, but will not control it during a fully-involved fire. A pressure difference of 0.10 inches of water is sufficient to prevent smoke from infiltrating elevator hoistways under the extreme condition of a fully-involved fire in the space next to the elevator door. This is supported by both engineering analysis and full scale fire tests (see NFPA 92A 2006; Klote and Milke 2002).

While at NIST, Dr. John Klote did a series of full-scale fire tests at the Plaza Hotel Building in Washington, D.C. In these fires, the section of a corridor near the stairs was fully involved in fire. In these tests, a pressure difference of 0.10 inches controlled smoke from very large fires that were only a few feet away from the stairway door. Another test consisted of a room fire that flashed over and remained at fully-developed conditions for some time. A number of other full scale tests have confirmed that pressurization can control smoke from extremely large fires. These tests show that 0.10 inches of water is sufficient to control smoke with a flashed-over fire anywhere on the floor even when it is in the corridor next to the stair door.

The second problem with the current provisions is that the pressure difference range of only 0.02 inches of water is too small. Normal fluctuations in pressure due to changes in wind and barometric pressure are about 0.01 to 0.03 inches of water. While it may be possible to design an elevator shaft pressurization system that would work with a range this small for a very short and simple building, it is not possible to design systems that would work for most buildings. Because of stack effect and floor-to-floor variations in building leakage, hoistway pressurization systems in most buildings will naturally require a much larger pressure difference range.

This proposal and a related one would require the same pressure difference for both stairs and elevators (minimum of 0.10 inches of water and maximum of 0.35 inches of water). Many buildings will have both pressurized stairs and elevators, and having the same design pressure differences will make design much simpler and the systems more reliable.

Some people have concerns about elevator doors jamming during hoistway pressurization. Increased pressure difference can sometimes cause elevator doors to jam closed, but such jammed doors typically require only modest force to open. They are not difficult to open by trained and properly-equipped firefighters. John Klote has conducted extensive research with elevator smoke control systems, and he has encountered only one instance of elevator doors jammed closed. In that case the doors were easily opened by hand. In fire situations, the elevators are required to go into Phase II operation which is sometimes called firefighter's service. The elevators are only used by firefighters who are equipped with various tools and capable of opening a door that has been jammed shut.

The intent of smoke control systems as stated in Section 909.1 is "to provide a tenable environment for the evacuation or relocation of occupants." Hoistway pressurization acts to prevent smoke from flowing through elevator hoistways and going to floors remote from the fire, helping to provide a tenable environment for the evacuation or relocation of occupants on floors remote from the fire. The changes made in this proposal are essential for design of hoistway pressurization systems that will be effective in controlling smoke.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: Doors opening at recall should be a part of the pressurization design. Reference to Chapter 9 in exception 6 to Section 707.14.1 could lead to misapplication of the code provisions because the smoke control provisions are not intended to apply to pressurization design. Lastly, Sections 707.14.2.2 through 707.14.2.5 would remain and would need to somehow be coordinated perhaps within Section 909.21.

Assembly Action:

None

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Maureen Traxler, City of Seattle, WA, representing Department of Planning & Development; John H. Klote, John H. Klote, Inc.; Douglas H. Evans, Clark County, NV, representing Department of Development Services; Assistant Chief Kenneth L. Tipler, Fire Marshall, City of Seattle, WA, representing Seattle Fire Department, requests Approved as Modified by this public comment.

Replace proposal as follows:

707.14.2 Enclosed elevator lobby pressurization alternative. Where elevator hoistway pressurization is provided in lieu of required enclosed elevator lobbies, the pressurization system shall comply with this section.

707.14.2.1 Pressurization requirements. Elevator hoistways shall be pressurized to maintain a minimum positive pressure of ~~0.04~~ 0.10 inches of water (~~9.96-25~~ Pa) and a maximum positive pressure of ~~0.06~~ 0.25 inches of water (~~14.94-67~~ Pa) with respect to adjacent occupied space on all floors. This pressure shall be measured at the midpoint of each hoistway door, with all elevator cars at the floor of recall and all hoistway doors on the floor of recall open and all other hoistway doors closed. The opening and closing of hoistway doors at each level must be demonstrated during this test. The supply air intake shall be from an outside, uncontaminated source located a minimum distance of 20 feet (6096 mm) from any air exhaust system or outlet.

707.14.2.2 Rational analysis. A rational analysis complying with Section 909.4 shall be submitted with the construction documents.

(Renumber subsequent sections.)

707.14.2.6 Marking and identification. Detection and control systems shall be marked in accordance with Section 909.14.

707.14.2.7 Control diagrams. Control diagrams shall be provided in accordance with Section 909.15.

707.14.2.8 Control panel. A control panel complying with Section 909.16 shall be provided.

707.14.2.9 System response time. Hoistway pressurization systems shall comply with the requirements for smoke control system response time in Section 909.17.

Commenter-s Reason: The IBC allows hoistway pressurization as an alternative to elevator lobbies. However, the current pressurization provisions do not provide a degree of safety comparable to elevator lobbies. The pressure differences of 0.04 to 0.06 inches allowed by the current code are not adequate to keep smoke from migrating through hoistways. The proposed minimum pressurization value of 0.10 is derived from the long experience of John Klote and the City of Seattle's practical experience with enforcing similar provisions. Research, engineering calculation and field observation, including full-scale fire tests, conducted by Dr. John Klote noted in the reason statement for the original proposal, all support 0.10 as the appropriate value for hoistway pressurization.

The maximum of 0.25 inches is based on Seattle's elevator inspection staff observations that pressure differences greater than 0.25 can cause difficulty in operation of elevator doors. Seattle has had hoistway pressurization provisions since 1977.

The rational design analysis per Section 909.4 is an important part of this proposal. It will require the design engineer to take into account the unique characteristics of the building, including location and number of elevators and hoistways, the size and configuration of the building, and other factors that will influence the behavior of the building during fire conditions.

The Code Development Committee's reasons for disapproving this proposal are all addressed in this comment. Hoistway pressurization requirements remain in Section 707.14, removing all ambiguity about which parts of Section 909 apply. All portions of Section 707.14.2 are retained, and the specific pertinent portions of Section 909 are referenced from that section. By retaining Section 707.14.2.1, it is clear that elevator doors are required to be open at the recall level when the pressurization level is measured.

Final Hearing Results

FS67-07/08

AMPC

Code Change No: FS68-07/08

Original Proposal

Section: 707.14.2.5

Proponent: Jonathan Siu, City of Seattle, WA, representing Washington Association of Building Officials Technical Code Development Committee

Revise as follows:

707.14.2.5 Activation of pressurization system. The elevator pressurization system shall be activated upon activation of the building fire alarm system or upon activation of the elevator lobby smoke detectors. Where both a building fire alarm system and elevator lobby smoke detectors are present, each shall be independently capable of activating the pressurization system.

Reason: The purpose of this proposal is to clarify the code requirement for how the elevator pressurization system is activated. The current language in the code appears to allow the designer to choose to activate the hoistway pressurization system with either the fire alarm system or the lobby smoke detectors, even if both are present. In other words, the designer could choose to use just the fire alarm system to trigger the pressurization system, and not hook the lobby smoke detector up to the pressurization system at all, or vice versa. We do not believe this is the intent of the code. Whether the fire is a hot fire away from the hoistway that triggers the fire alarm via sprinkler system activation or a smoky fire near the elevator lobby, the pressurization system should be activated as soon as possible in order to be effective at preventing the spread of smoke from floor to floor through the elevator hoistway. If only one system is capable of activating the hoistway pressurization, there could be a delay in providing that protection from smoke.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:**Approved as Submitted**

Committee Reason: The committee agreed that this proposal clarifies the code requirement for how the elevator pressurization system is activated. If both a fire alarm system and elevator lobby smoke detectors are provided, but only one is capable of activating the hoistway pressurization, there could be a delay in providing that protection from smoke.

Assembly Action:**None**

Final Hearing Results

FS68-07/08**AS**

Code Change No: FS69-07/08

Original Proposal

Section: 707.14.2.6 (New)

Proponent: Gregory J. Cahanin, Cahanin Fire & Code Consulting, representing Smoke Safety Council

Add new text as follows:

707.14.2.6 Special inspection. Special inspection for performance shall be required in accordance with Section 909.18.8. System acceptance shall be in accordance with Section 909.19.

Reason: The enclosed elevator lobby pressurization alternative does not have a clear link to inspection and performance of the pressurization system once installed. These new referenced requirements of Section 909, Smoke Control clearly establish acceptance testing responsibility and performance. The current 707.14.2.1 measurement requirements don't clearly establish who will acknowledge that the pressurization system meets the performance requirements established in 707.14.2.

In the 2006 IBC Commentary on 909.18.8 it is simply and accurately stated, "Smoke control systems require special inspection since they tend to be unique and complex life safety systems." Special inspections established in 909.18.8.1 are a key to insuring that at key stages the elevator shaft pressurization system meets design criteria. The IBC commentary states that the first round of special inspections occur before concealment of ductwork or fire protection elements and then second round that will result in a certificate of occupancy for the building. Inspections include the verification of pressure differences required in 707.14.2 in addition to the interconnection to the fire alarm and detection systems.

The new 909 references will insure that the proper professional trades are involved in the not only the design process, but the acceptance testing of these complex mechanical systems as well.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: Requiring special inspection for an elevator hoistway pressurization system is consistent with requirements for smoke control systems elsewhere in the code and is appropriate.

Assembly Action:

None

Final Hearing Results

FS69-07/08

AS

Code Change No: FS75-07/08

Original Proposal

Section: 709.5

Proponent: Tom Lariviere, Madison Fire Department, representing Joint Fire Service Review Committee

Revise as follows:

709.5 Openings. Openings in a smoke barrier shall be protected in accordance with Section 715.

Exceptions:

1. In Group I-2, where doors are installed across corridors, a pair of opposite-swinging doors without a center mullion shall be installed having vision panels with fire-protection-rated glazing materials in fire-protection-rated frames, the area of which shall not exceed that tested. The doors shall be close fitting within operational tolerances, and shall not have undercuts, louvers or grilles. The doors shall have head and jamb stops, astragals or rabbets at meeting edges and shall be automatic closing by smoke detection in accordance with Section 715.4.7.3. Positive-latching devices are not required.
2. In Group I-2, horizontal sliding doors installed in accordance with section 1008.1.3.3 and protected in accordance with Section 715.

Reason: Horizontal sliding doors meeting those provisions of section 1008.1.3.3 and 715 are acceptable components in a means of egress. Current language prohibits the use of these doors. This proposal will provide consistency and correlation with the other sections of the IBC.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The committee agreed that horizontal sliding doors meeting the provisions of section 1008.1.3.3 and 715 should be acceptable components in a means of egress.

Assembly Action:

None

Final Hearing Results

FS75-07/08

AS

Code Change No: FS76-07/08

Original Proposal

Section: 709.5

Proponent: John Woestman, The Kellen Company, representing Door Safety Council

Revise as follows:

709.5 Openings. Openings in a smoke barrier shall be protected in accordance with Section 715.

Exception: In Group I-2, where doors are installed across corridors, a pair of opposite-swinging doors without a center mullion shall be installed having vision panels with fire-protection-rated glazing materials in fire-protection-rated frames, the area of which shall not exceed that tested. The doors shall be close fitting within operational tolerances, and shall not have undercuts in excess of 3/4", louvers or grilles. The doors shall have head and jamb stops, astragals or rabbets at meeting edges and shall be automatic closing by smoke detection in accordance with Section 715.4.7.3. Where permitted by the door manufacturer's listing, ~~Positive-latching devices are not required.~~

710.5.2 Smoke and draft control doors. Where required elsewhere in the code, doors in smoke partitions shall be tested in accordance with UL 1784, ~~with an artificial bottom seal installed across the full width of the bottom of the door assembly during the test.~~ The air leakage rate of the door assembly shall not exceed 3 cubic feet per minute per square foot [ft³/(min ft²)](0.015424 m³/s m²) of door opening at 0.10 inch (24.9Pa) of water for both the ambient temperature test and the elevated temperature exposure test.

Reason: All doors have undercuts of some nominal dimension in order to permit operation. This proposal defines a maximum dimension, in compliance with that specified by NFPA 80 – Standard for Fire Doors and Other Opening Protectives – 2007 Edition.

Fire door assemblies required to have a minimum fire protection rating of 20 minutes where located in smoke barrier walls must be tested in accordance with NFPA 252 or UL 10C. These test protocols include requirements for positive latching of the test specimens. As proposed in the second revision, the new language would permit the omission of latching hardware where the door manufacturer's listing includes such applications.

The third revision in this proposal recommends deleting text that is redundant to the language of UL 1784, which requires the application of a bottom seal in order to conduct the test.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Modified

Modify the proposal as follows:

710.5.2 Smoke and draft control doors. Where required elsewhere in the code, doors in smoke partitions shall be tested in accordance with UL 1784: with an artificial bottom seal installed across the full width of the bottom of the door assembly during the test. The air leakage rate of the door assembly shall not exceed 3 cubic feet per minute per square foot [ft³/(min ft²)](0.015424 m³/s m²) of door opening at 0.10 inch (24.9Pa) of water for both the ambient temperature test and the elevated temperature exposure test.

Committee Reason: The committee indicated that the undercut tolerance of 3/4 inch for corridor doors in Group I-2 was appropriate and was useful for, and easily verified by, the code official. Also, the committee agreed that it is appropriate to permit the omission of latching hardware where the door manufacturer's listing includes such applications. The modification put the language regarding the artificial bottom seal back into Section 710.5.2 based on the proponent's request; this resulted in no technical changes to Section 710.5.2.

Assembly Action:

None

Final Hearing Results

FS76-07/08

AM

Code Change No: **FS77-07/08**

Original Proposal

Section: 710.5.2

Proponent: Bob Eugene, Underwriters Laboratories Inc.

Revise as follows:

710.5.2 Smoke and draft control doors. Where required elsewhere in the code, doors in smoke partitions shall ~~be~~ meet the requirements for a smoke and draft control door assembly tested in accordance with UL 1784 ~~with an artificial bottom seal installed across the full width of the bottom of the door assembly during the test.~~ The air leakage rate of the door assembly shall not exceed 3.0 cubic feet per minute per square foot [~~ft³/(min ft²)~~] (0.015424 m³/(s m²)) of door opening at 0.10 inch (24.9 Pa) of water for both the ambient temperature test and the elevated temperature exposure test. Installation of smoke doors shall be in accordance with NFPA 105.

Reason: The requirements for smoke and draft control doors are covered in Sections 707.14.1, 710.5.2 and 715.4.3.1 of the International Building Code (IBC). These three sections use somewhat different language. As such, the intent of this proposal is to harmonize the language of Section 710.5.2 with the language of Section 715.4.3.1 recently Approved under FS106-06/07, to the extent appropriate. A separate proposal was submitted for Section 707.14.1.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The committee agreed that the removal of the requirement for the artificial bottom seal for smoke and draft control doors clarified a long debated issue. Further the proposal coordinates the language of Section 710.5.2 with the language of Section 715.4.3.1 approved under FS106-06/07. Lastly, reference to NFPA 105 for installation of smoke doors is appropriate.

Assembly Action:

None

Final Hearing Results

FS77-07/08

AS

Code Change No: **FS80-07/08**

Original Proposal

Sections: 711.5, 711.6, 712.4.1.2, 902.1 (IFC [B] 902.1)

Proponent: Philip Brazil, PE, Reid Middleton, Inc., representing himself

Revise as follows:

711.5 Penetrations. Penetrations of ~~fire-resistance-rated~~ horizontal assemblies shall comply with Section 712.

711.6 Joints. Joints made in or between ~~fire-resistance-rated~~ horizontal assemblies shall comply with Section 713. The void created at the intersection of a floor/ceiling assembly and an exterior curtain wall assembly shall be protected in accordance with Section 713.4.

712.4.1.2 (Supp) Membrane penetrations. Penetrations of membranes that are part of a ~~fire-resistance-rated~~ horizontal assembly shall comply with Section 712.4.1.1.1 or 712.4.1.1.2. Where floor/ceiling assemblies are required to have a fire-resistance rating, recessed fixtures shall be installed such that the required fire resistance will not be reduced.

Exceptions:

1. Membrane penetrations by steel, ferrous or copper conduits, pipes, tubes or vents, or concrete or masonry items where the annular space is protected either in accordance with Section 712.4.1.1 or to prevent the free passage of flame and the products of combustion. The aggregate area of the openings through the membrane shall not exceed 100 square inches (64 500 mm²) in any 100 square feet (9.3m²) of ceiling area in assemblies tested without penetrations.
2. Ceiling membrane penetrations of maximum 2-hour ~~fire-resistance-rated~~ horizontal assemblies by steel electrical boxes that do not exceed 16 square inches (10 323 mm²) in area, provided the aggregate area of such penetrations does not exceed 100 square inches (44 500 mm²) in any 100 square feet (9.29m²) of ceiling area, and the annular space between the ceiling membrane and the box does not exceed 1/8 inch (3.12 mm).
3. Membrane penetrations by electrical boxes of any size or type, which have been listed as part of an opening protective material system for use in horizontal ~~fire-resistance-rated~~ assemblies and are installed in accordance with the instructions included in the listing.
4. Membrane penetrations by listed electrical boxes of any material, provided such boxes have been tested for use in fire-resistance-rated assemblies and are installed in accordance with the instructions included in the listing. The annular space between the ceiling membrane and the box shall not exceed 1/8 inch (3.1 mm) unless listed otherwise.
5. The annular space created by the penetration of a fire sprinkler, provided it is covered by a metal eschutcheon plate.

SECTION 902 DEFINITIONS

902.1 (Supp) (IFC [B] 902.1) Definitions. The following words and terms shall, for the purposes of this chapter, and as used elsewhere in this code, have the meanings shown herein.

FIRE AREA. The aggregate floor area enclosed and bounded by fire walls, fire barriers, exterior walls or ~~fire-resistance-rated~~ horizontal assemblies of a building. Areas of the building not provided with surrounding walls shall be included in the fire area if such areas are included within the horizontal projection of the roof or floor above.

Reason: The changes are proposed for consistency with the definition of "horizontal assembly" in Section 702.1, which is a "fire-resistance-rated floor or roof assembly of materials designed to restrict the spread of fire in which continuity is maintained." The changes will eliminate superfluous language. The code sections above contain the only instances of "fire-resistance-rated" preceding "horizontal assembly(ies)" in the IBC.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The committee agreed that the proposed revisions were appropriate for consistency with the definition of “horizontal assembly” in Section 702.1, which is a “fire-resistance-rated floor or roof assembly of materials designed to restrict the spread of fire in which continuity is maintained.”

Assembly Action:

None

Final Hearing Results

FS80-07/08

AS

Code Change No: **FS81-07/08**

Original Proposal

Sections: 711.9 (New), 407.4.3 (New)

Proponent: Rick Thornberry, PE, The Code Consortium, Inc., representing Alliance for Fire and Smoke Containment and Control (AFSCC)

PART I – IBC FIRE SAFETY

Add new text as follows:

711.9 Smoke barrier. Where horizontal assemblies are required to resist the movement of smoke by other sections of this code in accordance with the definition for smoke barrier, penetrations and joints in such horizontal assemblies shall be protected as required for smoke barriers in accordance with Sections 712.5 and 713.6. Doors located in elevators shaft enclosures that penetrate the horizontal assembly shall be protected by enclosed elevator lobbies complying with Section 707.14.1. Horizontal assemblies shall not be allowed to have unprotected vertical openings. Openings through a horizontal assembly shall be protected as required by Section 707.

PART II – IBC GENERAL

Add new text as follows:

407.4.3 Horizontal assemblies. Horizontal assemblies supporting smoke barriers required by this section shall be designed to resist the movement of smoke and shall comply with Section 711.9.

Reason: This code change proposal is intended to clarify the requirements for horizontal assemblies that are used to support smoke barrier walls such as in Group I-2 occupancies where smoke barriers are required to subdivide floors by Section 407.4. It is clear from the definition for “smoke barrier” that a smoke barrier can be a horizontal assembly. Furthermore, in order to provide for the continuity of the smoke protection for smoke compartments created by vertical smoke barriers to provide for relative safe areas for horizontal movement of patients in a fire emergency, it follows that the floors supporting those smoke barrier walls should also be able to resist the passage or movement of smoke through the assembly to maintain the appropriate level of protection for the occupants. Generally, occupants of Group I-2 occupancies are moved into a smoke barrier that is away from the area where the fire occurred so that they can remain until further moved as necessary or until the fire has been extinguished by the responding fire department. The provisions contained in this code change proposal we believe will provide the equivalent level of smoke protection to that of the smoke barrier for the horizontal assemblies that support the smoke barriers.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing Results

PART I – IBC FIRE SAFETY

Committee Action:

Disapproved

Committee Reason: The committee felt that sending the code-user to Sections 707.14.1 and 707 would be confusing because it is not clear what provisions in Section 707 are applicable to horizontal assemblies that are required to resist the movement of smoke.

Assembly Action:

None

PART II – IBC GENERAL

Committee Action:

Disapproved

Committee Reason: The proposed revisions would not work without the proposed requirements in Part I of the proposal. Part I was heard by the Fire Safety Committee later during the hearings.

Assembly Action:

None

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Mike Ashley, Alliance for Fire and Smoke Containment and Control (AFSCC) requests Approved as Modified by this public comment for Part I.

Modify proposal as follows:

711.9 Smoke barrier. Where horizontal assemblies are required to resist the movement of smoke by other sections of this code in accordance with the definition for smoke barrier, penetrations and joints in such horizontal assemblies shall be protected as required for smoke barriers in accordance with Sections 712.5 and 713.6. ~~Regardless of the number of stories connected by elevator shaft enclosures,~~ doors located in elevator shaft enclosures that penetrate the horizontal assembly shall be protected by enclosed elevator lobbies complying with Section 707.14.1. ~~Openings through horizontal assemblies shall be protected by shaft enclosures complying with Section 707.~~ Horizontal assemblies shall not be allowed to have unprotected vertical openings. ~~Openings through a horizontal assembly shall be protected as required by Section 707.~~

Commenter's Reason: We are requesting approval of this code change proposal as modified by this Public Comment. It provides appropriate code requirements for horizontal assemblies used to support smoke barriers required in Group I-2 occupancies. Currently, the code does not contain specific requirements for these horizontal assemblies which act as smoke barriers based on the definition for "smoke barriers" in Section 702.1. This will provide clear guidance to designers of Group I-2 occupancies, as well as to code enforcement officials responsible for assuring such occupancies comply with the code for the protection the occupants from smoke.

We believe the revisions proposed in this Public Comment respond to the Fire Safety Committee's reasons for recommending disapproval of Part I of this code change proposal which was critical to its proper application. We have revised the reference to Section 707 by specifying that we are requiring shaft enclosures to protect the openings in horizontal assemblies in accordance with the provisions for shaft enclosures in Section 707. We have also reformatted the last two sentences so that the last sentence will contain the restriction on the prohibition of unprotected vertical openings through horizontal assemblies. We believe it is more appropriate for it to follow the requirements that openings in horizontal assemblies be protected by shaft enclosures in accordance with Section 707 so that any of the Exceptions or alternate provisions in Section 707 that allow for unprotected vertical openings under limited conditions would not apply to horizontal assemblies supporting smoke barriers.

Also, we have responded to the Committee's concern about a direct reference to Section 707.14.1 for the protection of doors located in elevator shaft enclosures that penetrate the horizontal assembly used to support smoke barriers. We are requiring that an enclosed elevator lobby be provided in compliance with Section 707.14.1. The purpose of Section 707.14.1 is to basically limit the spread of smoke from floor to floor in buildings having elevators serving more than three stories. So we have further clarified the reference to enclosed elevator lobbies by indicating that the limitation on the number of stories served is not applicable to this situation. This is because it doesn't matter how many floors are connected by an elevator shaft when the floors serve as horizontal assemblies supporting smoke barriers and are, themselves, smoke barriers since the purpose is to prevent smoke migration from floor to floor.

In conclusion, we believe that the modifications in this Public Comment adequately respond to the Committee's concerns about the provisions contained in proposed new Section 711.9 Smoke Barrier. We further believe that these provisions are essential for the proper enforcement of the code in protecting occupants in place who are generally bed-ridden in Group I-2 occupancies. Therefore, we respectfully request that the ICC Class A voting members approve this Public Comment for approved as modified for Code Change Proposal FS81-07/08.

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Mike Ashley, Alliance for Fire and Smoke Containment and Control (AFSCC) requests Approval as Submitted for Part II.

Commenter's Reason: See above reason for public comment to Part I.

Final Hearing Results

FS81-07/08, Part I
FS81-07/08, Part II

AMPC
AS

Code Change No: **FS85-07/08**

Original Proposal

Sections: 202 (New), 712.3, 2102.1

Proponent: Philip Brazil, PE, Reid Middleton, Inc., representing himself

THESE PROPOSALS ARE ON THE AGENDA OF THE IBC FIRE SAFETY AND IBC STRUCTURAL CODE DEVELOPMENT COMMITTEES AS 2 SEPARATE CODE CHANGES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IBC FIRE SAFETY

1. Revise as follows:

712.3 (Supp) Fire-resistance-rated walls. Penetrations into or through fire walls, fire-barriers, smoke-barrier walls, and fire partitions and fire-resistance-rated load-bearing walls shall comply with Sections 712.3.1 through 712.3.4. Penetrations in smoke barrier walls shall also comply with ~~712.5~~ 712.6.

2. Add definition as follows:

SECTION 202 DEFINITIONS

PARTITION. A nonstructural interior wall that spans horizontally or vertically from support to support.

PART II – IBC STRUCTURAL

1. Revise as follows:

SECTION 2102 DEFINITIONS AND NOTATIONS

WALL. A vertical element with a horizontal length-to-thickness ratio greater than three, used to enclose space.

The definition of “Wall” is limited in application to the provisions of Chapter 21.

Cavity wall. A wall built of masonry units or of concrete, or a combination of these materials, arranged to provide an airspace within the wall, and in which the inner and outer parts of the wall are tied together with metal ties.

Composite wall. A wall built of a combination of two or more masonry units bonded together, one forming the backup and the other forming the facing elements.

Dry-stacked, surface-bonded walls. A wall built of concrete masonry units where the units are stacked dry, without mortar on the bed or head joints, and where both sides of the wall are coated with a surface-bonding mortar.

Masonry-bonded hollow wall. A wall built of masonry units so arranged as to provide an airspace within the wall, and in which the facing and backing of the wall are bonded together with masonry units.

Parapet wall. The part of any wall entirely above the roof line.

Reason: Section 712.3 requires penetrations into and through vertical fire containment assemblies (i.e., fire walls, fire barriers, smoke barrier walls and fire partitions) to be protected with listed penetration firestop systems or equivalent protection. It is common in light-frame and similar methods of construction for load-bearing walls to be constructed of wood studs or cold-formed steel studs and covered with gypsum wallboard, thereby forming cavities between the studs. When the load-bearing walls are also fire-resistance-rated due to the building’s type of construction and other requirements, penetrations into or through the load-bearing walls by pipes, tubes, conduits, electrical boxes and other penetrating items can compromise the ability of the wall to support design loads unless the penetrations are protected in the same manner as the penetrations of fire containment assemblies are currently required to be protected.

The continuity provisions for fire barriers (Section 706.5), shaft enclosures (by reference to the provisions for fire barriers), fire partitions (Section 708.4), smoke barriers (Section 709.4), and horizontal assemblies (Section 711.4) require the supporting construction to be protected with fire-resistance-rated construction at least equal to that of the fire containment assembly being supported. If the supporting construction consists of load-bearing walls constructed of wood studs or cold-formed steel studs and covered by gypsum wallboard, penetrations into or through the membranes of these walls can also compromise the ability of the wall to support the fire containment assembly unless the penetrations are protected in the same manner as the penetrations of fire containment assemblies are currently required to be protected.

The ability of a fire containment assembly to provide its intended protection is only as good as its weakest link. The purpose of this proposal is to eliminate fire-resistance-rated load-bearing walls as a potential weakest link.

Several definitions are revised in conjunction with this proposal. A load-bearing wall is defined in Section 202 as a "metal or wood stud wall that supports more than 100 pounds per linear foot of vertical load in addition to its own weight," or a "masonry or concrete wall that supports more than 200 pounds per linear foot of vertical load in addition to its own weight." Section 2102 defines "wall" as a "vertical element with a horizontal length-to-thickness ratio greater than three, used to enclose space." It is apparent from this latter definition that its application is intended to be limited to the provisions of Chapter 21 on masonry. This proposal clarifies the intent by adding text after the definition of "wall" to specify this limited application.

The IBC uses the term "partition" in numerous places but does not provide a definition for it. Without one in the IBC, it has no technical meaning except to the extent that a technical meaning can be derived from the ordinarily accepted meaning of "partition" (refer to Section 201.4). There is confusion among some code users about the distinction between a "wall" and a "partition." This apparent confusion could have an impact on understanding the application of the requirements for load-bearing walls in this proposal. Consequently, this proposal adds a definition for "partition," which was modeled after the definition of "partition" in Section 11.2 of ASCE 7-05.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing Results

PART I – IBC FIRE SAFETY

Committee Action:

Disapproved

Committee Reason: The committee agreed that the application of the penetration protection requirements to fire-resistance load bearing walls was confusing. Typically, load bearing walls can have any number of penetrations that do not affect the structural integrity of the wall that are not specifically protected in accordance with Section 713.2. If the load bearing wall is not also expected to resist the passage of heat and/or products of combustion, then protection of these penetrations is generally not warranted.

Assembly Action:

None

PART II – IBC STRUCTURAL

Committee Action:

Approved as Submitted

Committee Reason: The definition of wall in Chapter 21 is specific to masonry and this proposal makes that clear.

Assembly Action:

None

Final Hearing Results

FS85-07/08, Part I
FS85-07/08, Part II

D
AS

Code Change No: **FS89-07/08**

Original Proposal

Section: 712.3.2

Proponent: Bob Eugene, Underwriters Laboratories Inc.

Revise as follows:

712.3.2 (Supp) Membrane penetrations. Membrane penetrations shall comply with Section 712.3.1. Where walls or partitions are required to have a fire-resistance rating, recessed fixtures shall be installed such that the required fire-resistance will not be reduced.

Exceptions:

1. Membrane penetrations of maximum two-hour fire-resistance-rated walls and partitions by steel electrical boxes that do not exceed 16 square inches (0.0103 m²) in area, provided the aggregate area of the openings through the membrane does not exceed 100 square inches (0.0645 m²) in any 100 square feet (9.29m²) of wall area. The annular space between the wall membrane and the box shall not exceed 1/8 inch (3.1 mm). Such boxes on opposite sides of the wall or partition shall be separated by one of the following:

- 1.1. By a horizontal distance of not less than 24 inches (610 mm) where the wall or partition is constructed with individual non-communicating stud cavities;
- 1.2. By a horizontal distance of not less than the depth of the wall cavity where the wall cavity is filled with cellulose loose-fill, rockwool or slag mineral wool insulation;
- 1.3. By solid fireblocking in accordance with Section 717.2.1;
- 1.4. By protecting both outlet boxes with listed putty pads; or
- 1.5. By other listed materials and methods.
2. Membrane penetrations by listed electrical boxes of any material, provided such boxes have been tested for use in fire-resistance-rated assemblies and are installed in accordance with the instructions included in the listing. The annular space between the wall membrane and the box shall not exceed 1/8 inch (3.1 mm) unless listed otherwise. Such boxes on opposite sides of the wall or partition shall be separated as follows:
 - 2.1. By a horizontal distance of not less than 24 inches (610 mm);
 - 2.2. By solid fireblocking in accordance with Section 717.2.1;
 - 2.3. By protecting both boxes with listed putty pads; or
 - 2.4. By other listed materials and methods.
3. Membrane penetrations by electrical boxes of any size or type, which have been listed as part of a wall opening protective material system for use in fire-resistance-rated assemblies and are installed in accordance with the instructions included in the listing.
4. Membrane penetrations by boxes other than electrical boxes provided such penetrating items and the annular space between the wall membrane and the box, are protected by an approved membrane penetration firestop system installed as tested in accordance with ASTM E 814 or UL 1479, with a minimum positive pressure differential of 0.01 inch (2.49 Pa) of water, and shall have an F and T rating of not less than the required fire-resistance rating of the wall penetrated and be installed in accordance with their listing.
5. The annular space created by the penetration of an automatic sprinkler, provided it is covered by a metal escutcheon plate.

Reason: This proposal is intended to coordinate the requirement of the International Building Code (IBC) with the requirements of the International Residential Code (IRC). During the 2006/2007 Code Development Cycle, this same wording was proposed for inclusion in the IRC and the IBC under Proposal No. FS83. The IRC Building/Energy Committee approved the proposal for inclusion in Section R317.3.2 of the IRC. The IBC Fire Safety Committee brought up concerns and the proposal was disapproved for the IBC. Although the code language included herein is identical to that submitted during the previous cycle under Proposal No. FS83, the justification will attempt to address the concerns of the IBC Fire Safety Committee.

Exceptions 1 and 2 to Section 712.3.2 of the IBC permit electrical boxes to penetrate the membranes of fire-resistance-rated walls and partitions with certain limitations. The limitations on steel electrical boxes covered in Exception 1 include the maximum size of box, the maximum aggregate area of boxes per 100 sq ft of wall area, the annular space between the boxes and the wall membrane, and various methods of separating boxes on opposite sides of walls. Item 1.1 currently requires separation of electrical boxes on opposite sides of walls or partitions by a minimum of 24 in. Presumably, this is intended to place boxes on opposite sides of walls or partitions in separate stud cavities. However, Item 1.1 does not differentiate between installations in walls or partitions constructed with individual stud cavities versus those where the adjacent stud cavities are interconnected. An example of the former would be a wall constructed of either wood or steel studs with gypsum board applied directly to the studs. Examples of the latter would be walls or partitions constructed using resilient channels, or those using parallel rows of studs or staggered studs. Parallel stud construction typically consists of two rows of studs on separate wood plates or steel tracks at the top and bottom. Staggered stud construction typically consists of the two rows of studs on oversized common wood plates top and bottom, with the studs alternately aligned with opposite sides of the common wood plates.

When electrical boxes are placed in adjacent cavities on opposite sides of walls or partitions constructed with individual stud cavities, the studs act as fireblocking to limit the transfer of heat through the wall via the electrical boxes. However, this fireblocking by the studs does not exist for walls or partitions without individual stud cavities. In walls or partitions without individual stud cavities, such as with walls constructed with parallel rows of studs or staggered studs, penetrations by electrical boxes expose the interior spaces within the wall to the free passage of heat and products of combustion, which can travel laterally within the wall. The free transfer of heat and products of combustion could potentially compromise the integrity of the fire-resistance-rated barrier if unprotected outlet box penetrations exist on both sides of the wall.

In summary, the specific intent of this proposal is to limit the use of the current 24 in. separation in Item 1.1 to walls constructed with individual stud cavities. Electrical boxes on opposite sides of walls or partitions without individual cavities will as a result need to be protected by one or more of the methods described in Items 1.2 through 1.5.

During the 2006/2007 Code Development Cycle, the Fire Safety Committee had two concerns about the proposed changes to Item 1.1. First, they questioned how the revisions to Item 1.1 coordinate with Items 1.2 through 1.5. With or without this proposal, Item 1.1 provides one solution for separating boxes on opposite sides of the wall. If it applies, it is an option. If not, some other solution is needed. Items 1.2 through 1.5 provide other solutions. Second, they questioned whether a 24 in. separation between boxes on opposite sides of the wall was needed in a wall constructed with non-communicating stud cavities. For wood stud walls, this question is already addressed via Item 1.2. Item 1.2 allows the boxes to be separated by solid fireblocking. Section 718 lists nominal 2 in. lumber as appropriate for fireblocking. As such, boxes separated by a nominal 2 in. wood stud, regardless of the spacing, are permitted by Item 1.2. The answer to the Committee's question is not as clear for steel stud walls. The 24 in. separation first appeared in the 1979 Edition of the ICBO Uniform Building Code. Unfortunately, the original proposal does not state the justification for the 24 in. separation. As indicated earlier, presumably it was intended to place boxes on opposite sides of walls in separate stud cavities. Presumably, it was also intended to cover wood and steel stud walls. Since stud spacing is typically 12, 16 or 24 in. OC, a 24 in. box separation always assures the boxes are in different cavities. Certainly alternative wording could be developed to likewise assure boxes on opposite sides of the wall are in different cavities even with some lesser spacing. However, without having data to justify some other approach, it is suggested the more conservative approach of maintaining the current 24 in. separation be retained for walls constructed with non-communicating stud cavities.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The committee agreed that this was an appropriate clarification with respect to membrane penetration requirements that would be consistent with the requirements of the IRC.

Assembly Action:

None

Final Hearing Results

FS89-07/08

AS

Code Change No: **FS90-07/08**

Original Proposal

Section: 712.3.2

Proponent: Bob Eugene, Underwriters Laboratories Inc.

Revise as follows:

712.3.2 (Supp) Membrane penetrations. Membrane penetrations shall comply with Section 712.3.1. Where walls or partitions are required to have a fire-resistance rating, recessed fixtures shall be installed such that the required fire-resistance will not be reduced.

Exceptions:

1. Membrane penetrations of maximum two-hour fire-resistance-rated walls and partitions by steel electrical boxes that do not exceed 16 square inches (0.0103 m²) in area, provided the aggregate area of the openings through the membrane does not exceed 100 square inches (0.0645 m²) in any 100 square feet (9.29m²) of wall area. The annular space between the wall membrane and the box shall not exceed 1/8 inch (3.1 mm). Such boxes on opposite sides of the wall or partition shall be separated by one of the following:
 - 1.1. By a horizontal distance of not less than 24 inches (610 mm);
 - 1.2. By a horizontal distance of not less than the depth of the wall cavity where the wall cavity is filled with cellulose loose-fill, rockwool or slag mineral wool insulation;
 - 1.3. By solid fireblocking in accordance with Section 717.2.1;
 - 1.4. By protecting both outlet boxes with listed putty pads; or
 - 1.5. By other listed materials and methods.
2. Membrane penetrations by listed electrical boxes of any material, provided such boxes have been tested for use in fire-resistance-rated assemblies and are installed in accordance with the instructions included in the listing. The annular space between the wall membrane and the box shall not exceed 1/8 inch (3.1 mm) unless listed otherwise. Such boxes on opposite sides of the wall or partition shall be separated as follows by one of the following:
 - 2.1. ~~By a the horizontal distance of not less than 24 inches (610 mm) specified in the listing of the electrical boxes;~~
 - 2.2. By solid fireblocking in accordance with Section 717.2.1;
 - 2.3. By protecting both boxes with listed putty pads; or
 - 2.4. By other listed materials and methods.
3. Membrane penetrations by electrical boxes of any size or type, which have been listed as part of a wall opening protective material system for use in fire-resistance-rated assemblies and are installed in accordance with the instructions included in the listing.

4. Membrane penetrations by boxes other than electrical boxes provided such penetrating items and the annular space between the wall membrane and the box, are protected by an approved membrane penetration firestop system installed as tested in accordance with ASTM E 814 or UL 1479, with a minimum positive pressure differential of 0.01 inch (2.49 Pa) of water, and shall have an F and T rating of not less than the required fire-resistance rating of the wall penetrated and be installed in accordance with their listing.
5. The annular space created by the penetration of an automatic sprinkler, provided it is covered by a metal escutcheon plate.

Reason: This proposal is intended to coordinate the requirement of the International Building Code (IBC) with the requirements of the International Residential Code (IRC). During the 2006/2007 Code Development Cycle, this same wording was proposed for inclusion in the IRC and the IBC under Proposal No. FS83. The IRC Building/Energy Committee approved the proposal for inclusion in Section R317.3.2 of the IRC. The IBC Fire Safety Committee brought up concerns with other provisions included within Proposal No. FS83, and the proposal was disapproved in its entirety for the IBC. There were no concerns expressed on the proposed revision to Item 2.1. As such, the proposed revision to Item 2.1 included herein is identical to that submitted during the previous cycle under Proposal No. FS83 and approved for inclusion in the IRC.

Exceptions 1 and 2 to Section 712.3.2 of the IBC permit electrical boxes to penetrate the membranes of fire-resistance-rated walls and partitions with certain limitations. Exception 1 addresses steel electrical boxes while Exception 2 addresses listed electrical boxes of any materials. Exception 2 specifically permits membrane penetrations of electrical boxes of any materials provided the boxes have been tested for use in fire-resistance-rated assemblies and are installed in accordance with their listing. In the case of listings through UL, the listings are covered under the product category "Outlet Boxes and Fittings Classified for Fire Resistance" (CEYY). Each listing states the Model No., the wall construction, the maximum individual opening size, the maximum aggregate area of openings per 100 sq ft of wall area, the maximum annular space between the boxes and the wall membrane, and the minimum separation between boxes on opposite sides of the wall. Prior to the year 2000, all UL listed nonmetallic boxes had been tested with a minimum separation of 24 in. The 24 in. separation was intended to assure that boxes on opposite sides of the wall were in separate stud cavities. In 2000, one manufacturer developed, tested and listed boxes with a lesser separation, allowing boxes on opposite sides of the wall to be located in the same stud cavity. As such, their listing states the lesser spacing. Since that time several other manufacturers have developed, tested and listed boxes which can also be installed at a separation less than 24 in. As such, Item 2.1 is more restrictive than the testing and listings would now suggest is needed. This proposal is simply intended to permit the installation of boxes on opposite sides of the wall at the horizontal separation permitted by the listing.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The committee agreed that many electrical boxes have been tested as part of the fire rated assembly; therefore limiting the horizontal distance to that specified by the testing is reasonable.

Assembly Action:

None

Final Hearing Results

FS90-07/08

AS

Code Change No: FS95-07/08

Original Proposal

Section: 712.4.1.1.2

Proponent: John Valiulis, PE, Hilti, Inc.

Revise as follows:

712.4.1.1.2 Through-penetration firestop system. Through penetrations shall be protected by an approved through-penetration firestop system installed and tested in accordance with ASTM E 814 or UL 1479, with a minimum positive pressure differential of 0.01 inch of water (2.49 Pa). The system shall have an F-rating and a T-rating of not less than 1 hour but not less than the required rating of the floor penetrated.

Exception: Floor penetrations contained and located within the cavity of a wall above the floor or below the floor do not require a T- rating.

Reason: To clarify what types of installation conditions can prevent a floor through-penetration from getting unsafely hot in the event of a fire.

The normal requirement for firestopping of a penetration through a floor is for the firestop system to provide a T-rating that is equivalent to the F-rating, so as to prevent the penetrant from exceeding a temperature rise of 325 F on the unexposed (non-fire) side. This is normally accomplished by providing some amount of thermal insulation on the penetrating item.

It has long been generally recognized that if the penetrating item is concealed within a wall, then the conditions that can lead to an unsafe temperature rise in the penetrating item should not exist. This occurs due to two possible conditions:

1. The penetrating item is shielded from the fire below the floor by being contained within the cavity of a wall. This will prevent direct heat transfer from the fire to the penetrating item, thus allowing the temperature above the floor from rising as it would if the penetrating item was exposed to the fire.
2. The penetrating item is protected from accidentally igniting combustible contents in the space above the floor by being contained above the floor within the cavity of a wall.

Either will achieve the desired effect, either by keeping the penetrant from getting as hot as quickly, or by shielding an overheated penetrant from combustibles in the room above. The clarification to the exception is thus proposed to indicate that either option would accomplish the desired goal, albeit in a different way.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The committee recognized that if the penetrating item is concealed within a wall, then the conditions that can lead to an unsafe temperature rise in the penetrating item should not exist; therefore removing the requirement for a T-rating at these locations is reasonable.

Assembly Action:

None

Final Hearing Results

FS95-07/08

AS

Code Change No: FS97-07/08

Original Proposal

Section: 712.4.2.1

Proponent: John Valiulis, PE, Hilti, Inc.

Revise as follows:

712.4.2.1 Noncombustible penetrating items. Noncombustible penetrating items that connect not more than three stories are permitted, provided that the annular space is filled to resist the free passage of flame and the products of combustion with an approved noncombustible material ~~to resist the free passage of flame and the products of combustion~~ or with a fill, void or cavity material that is tested and classified for use in through-penetration firestop systems.

Reason: The purpose of this code change is to expand the range of materials that are allowed to be used for sealing of penetrations in non-fire-resistance rated floors to include the materials that are already allowed by this code to be used to seal penetrations in fire-resistive floors.

Materials that are tested and classified by accredited test laboratories as "fill, void or cavity materials for use in through-penetration firestop systems" are used as part of firestop systems that are tested and listed in accordance with test method ASTM E814 (UL 1479) to meet the requirements of IBC section 712. 4.1.1.2 "Through-penetration firestop system". With very few exceptions, these materials would NOT meet the definition of non-combustible, and thus would not be permitted per the 2006 IBC to seal penetrations in non-fire-resistance rated assemblies. However, if these materials can be used to meet the requirements for the sealing of penetrations in fire-resistance rated assemblies, it stands to reason that they should also be allowed as an option in sealing penetrations through non-fire-resistance rated floors. The present code language is overly restrictive and prohibits the use of other products that can achieve the same performance just as well or possibly even better.

Another indication of the fact that the requirement in 712.4.2.1 is unnecessarily restrictive is the fact that the very next code article, 712.4.2.2, which deals with both combustible and noncombustible penetrating items, does not mandate the sealing material to be non-combustible. Since

the sealing of penetrating items that are combustible is logically more demanding than the sealing of penetrating items that are non-combustible, it stands to reason that if the requirement for a non-combustible sealant does not exist for sealing combustible penetrants, then there is no need to impose that restriction for the sealing of non-combustible penetrants, as long as the sealant material has been demonstrated to have properties that make it suitable for use in fire-related applications, as is the case with the classified "fill, void or cavity materials".

The exceptional demands placed on such materials by firestop system testing (per ASTM E814/UL1479) means that materials that have succeeded in being so listed will have properties that make them particularly suitable to seal the annular space in both rated or non-rated floors, with properties such as excellent adhesion to both substrate and penetrants, and good high-temperature resistance via a variety of chemical and physical processes such as insulation, ablation or intumescence.

Materials that have met the requirements for Classification as "Fill, void or cavity material for use in through-penetration firestop systems" can be found, for example, in the UL Fire Resistance Directory (or online at www.UL.com) under the listing category XHHW.

Cost Impact: The code change proposal will not increase the cost of construction. The proposed code change would allow the user additional options and additional flexibility, without disallowing the solution that has previously existed.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The committee agreed that it was appropriate to expand the range of materials that are allowed to be used for sealing of penetrations in non-fire-resistance rated floors to include the materials that are already allowed by this code to be used to seal penetrations in fire resistance rated floors.

Assembly Action:

None

Final Hearing Results

FS97-07/08

AS

Code Change No: FS99-07/08

Original Proposal

Section: 712.5

Proponent: John Williams, Washington State Department of Health, Construction Review Services, representing Washington Association of Building Officials, Technical Code Development Committee

Revise as follows:

712.5 Penetrations in smoke barriers. Penetrations in smoke barriers shall be tested in accordance with the requirements of UL 1479 for air leakage. ~~The air leakage rate of the penetration assembly shall not exceed 5.0 cfm per square foot (0.025m³/s • m²) of penetration opening at 0.30 inch (7.47 Pa) of water for both the ambient temperature and elevated temperature tests.~~

Reason: To delete the requirement for an individual penetration of a smoke barrier to comply with 5 cfm/sq ft. The 5 cfm/sq ft value imposes a restriction on an individual opening rather than minimizing the total smoke leakage within a given area. Thus, it does not significantly improve life safety and only serves to raise the cost of construction.

The Standard, UL 1479 includes an optional air leakage test to determine how well a particular opening is sealed against particulate air and smoke. While in principle it is a good idea to be cognizant of air leakage, this code requirement does not make buildings safer because the method used to report air leakage is flawed.

Reporting air leakage by expressing it in terms of cfm/sq ft is not the actual leakage through the opening. This allows the test to be manipulated to comply with the 5 cfm/sq ft value while at the same time not reducing the air leakage through the opening.

Air leakage occurs within unsealed space within a given opening. In the case of grouped electrical or communications cabling, it represents the interstitial space between each cable within the bundle. In other words, the cables typically do not nest tightly enough to prevent leakage from occurring within the bundle itself. Using caulk to provide a seal around the bundle will provide a near hermetic seal around the bundle, but it will not reduce the leakage through the interstitial space within the bundle. Therefore, the leakage within the bundle is a constant. To mathematically show the flaw in expressing leakage in terms of cubic feet per minute per square foot, please see the examples below:

Consider a 4" diameter cable bundle passes through a 0.5 sq ft opening and the actual leakage is 4.9 cfm - expressed in cfm/sq ft, the leakage would be 9.8 cfm/sq ft (4.9/0.5=9.8).

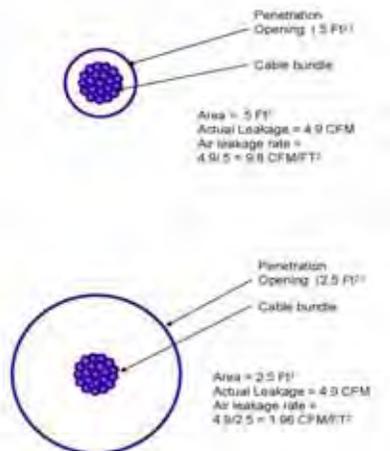
However, if the same 4" diameter cable bundle passes instead through a 2.5 sq ft opening, the interstitial (i.e. unsealed) space within the bundle does not change, so the actual leakage is still 4.9. However, dividing 4.9 by 2.5 will yield a leakage rating of 1.96 cfm/sq ft (4.9/2.5=1.96). The 2 cfm/sq ft value complies with the requirements of Section 712.5 yet the leakage remains the same.

The easy way to make a system pass is to increase the size of the opening. It is not improving life safety because the actual leakage has not been reduced despite the fact that the design listing may state that it provides an L Rating of 5 cfm/sq ft or less. Additionally, most third party laboratories list opening sizes in terms of a "maximum", but they do not specify a minimum opening size. Therefore, a design listing with a published L Rating less than 5 cfm/sq ft may actually provide false comfort since the same grouped penetrant bundle installed through a smaller opening will have a computed L Rating above 5 cfm/sq ft when tested despite the fact that the design listing permits the installation in smaller openings by specifying a maximum opening size without restricting the minimum size.

Finally, limiting an individual opening to 5 cfm/sq ft, but not capping the aggregate may encourage the practice of simply making more small openings that do comply with 5 cfm/sq ft to simply get the same volume of building services into a given area. If a group of air conditioning line sets has an L Rating greater than 5 cfm/sq ft, simply splitting the bundle into two openings may in fact allow each individual bundle to comply with 5 cfm/sq ft, but if you calculate the interstitial space, the actual leakage doesn't change. This has the effect of weakening the wall overall.

Section 712.5 as presently written in the 2006 IBC may actually have a negative impact on life safety by compromising the performance of the assembly by promoting the concept of creating larger openings or a series of smaller openings. The 5 cfm/sq ft value was prematurely added to the codes. It should be struck until such time that reporting methods improve or a better methodology for evaluating leakage through a smoke barrier can be developed.

I am not averse to leaving a reference to the air leakage tests of UL 1479 in the code for now provided that the value is eliminated. It plays up the importance of looking for tested systems, while not mandating a specific value that is arbitrary and subject to exploitation of present testing and reporting methods.



Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The committee felt that criteria for testing of penetrations through smoke barriers in accordance with UL 1479 were needed and should not simply be deleted; this would create a hole in the code.

Assembly Action:

None

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Tony Crimi, A.C. Consulting Solutions Inc., representing International Firestop Council and Bob Eugene, Underwriters Laboratories Inc. request Approved as Modified by this public comment.

Modify proposal as follows:

712.5 Penetrations in smoke barriers. Penetrations in smoke barriers shall be tested in accordance with the requirements of UL 1479 for air leakage. The air leakage rate of the penetration assemblies measured at 0.30 inch (7.47 Pa) of water in both the ambient temperature and elevated temperature tests, shall not exceed:

1. 5.0 cfm per square foot (0.025m³ / s-m²) of penetration opening for each through-penetration firestop system, or,
2. A total cumulative leakage of 50 cfm for any 100 square feet of wall area, or floor area.

Commenter's Reason: (Crimi) There is a need to better define and quantify the performance of Smoke Barriers & Smoke Partitions with respect to their ability to prevent smoke from migrating across them in a fire situation. The existing language in 712.5 of the IBC is a means of providing some minimal level of performance for the through penetrations. The current language has the potential to be manipulated to make the requirement ineffective because the 5 cfm/sq ft value imposes a restriction on an individual opening rather than restricting the total smoke leakage within a given area. To better specify the limits for smoke leakage of through penetrations in Smoke Barriers it is more reasonable to require a total smoke barrier performance level per 100 ft² (for example) in addition to dealing with individual items. By doing that, it would be possible to be more flexible with the individual penetrations, but more comprehensive on the smoke barrier leakage performance.

Justification: This proposed Code change is intended to clarify and improve the Code regarding the requirements for smoke leakage through penetrations in smoke barriers. This proposal would retain the existing 5 cfm/ft² for individual through penetrations as one option, but would allow a new alternative requirement for the cumulative total leakage of all through-penetrations in a smoke barrier. The 50 cfm suggested here is based on two approaches:

1. A very simplistic approach of a theoretical maximum of 10 through penetrations @ max allowed 5 cfm/ft² in 100 ft² of wall or floor area.
2. Section 909.5 permits 1 sq ft of leakage area per 1000 sq feet of wall space. Based on some fundamental assumptions about anticipated pressure differentials during fires, the cumulative value of 50 cfm per 100 ft² proposed also represents approximately 50% of that permitted leakage.

Consequently, if the L-rating of a particular system being used is less than the maximum of 5 cfm/ft², then more through-penetrations could be installed in the same 100 ft² of wall area. Alternatively, an individual through-penetration could be greater than 5 cfm/ft² if the total for the 100 ft² of wall or floor area does not exceed the 50 cfm cumulative value.

Section 715.4.3.1 of the IBC currently includes requirements for leakage rated smoke and draft control doors in corridors and smoke barriers. In addition to these individual limits, the IBC has effectively already established a cumulative level of smoke leakage through these doors in Chapter 10 by identifying the required number of openings for exits and exit access. In addition, Section 705.8 limits the aggregate width of openings at any floor level in a Fire Wall to 25% of the length of the wall. Similarly, Section 706.7 also limits the maximum aggregate width of openings to 25% for Fire Barriers.

For smoke and draft control doors, the IBC contains limits requires the addition of 3.0 cfm/sq ft for each door within the 100 sq ft area (measured at 0.1 in of water column), since that its the limit for smoke and draft control doors in UL 1784 and NFPA 105. The value for leakage through penetrations is actually identical to the leakage rating of smoke and draft control doors in smoke barriers, since 3 cfm/ft² measured at 0.1 in of water column is equivalent to 5.2 cfm/ft² at 0.3 inches of water.

Commenter's Reason: (Eugene) The original proponent pointed out some valid issues relating to the current code provisions relating penetration of smoke barriers. However, deleting the quantitative requirements entirely will leave an unenforceable provision in the code. As such, this public comment is intended to present a solution to the issues brought up by the original proponent.

This proposal suggests two either/or requirements to the air leakage requirements. First, it suggests the current limit of 5.0 cfm per square foot of penetration opening be maintained. Second, it suggests an absolute limit of permissible smoke leakage per 100 sq ft of wall or floor area. The 50 cfm leakage was selected as a reasonable compromise based to the performance of systems published in the UL Fire Resistance Directory.

Final Hearing Results

FS99-07/08

AMPC

Code Change No: FS102-07/08

Original Proposal

Section: 713.1

Proponent: Jason J. Krohn, PE, Precast/Prestressed Concrete Institute

Revise as follows:

713.1 (Supp) General. Joints installed in or between fire-resistance-rated walls, floor or floor/ceiling assemblies and roofs or roof/ceiling assemblies shall be protected by an approved fire-resistant joint system designed to resist the passage of fire for a time period not less than the required fire-resistance rating of the wall, floor or roof in or between which it is installed. Fire-resistant joint systems shall be tested in accordance with Section 713.3. The void created at the intersection of a floor/ceiling assembly and an exterior curtain wall assembly shall be protected in accordance with Section 713.4.

Exception: Fire-resistant joint systems shall not be required for joints in all of the following locations:

1. Floors within a single dwelling unit.
2. Floors where the joint is protected by a shaft enclosure in accordance with Section 707.

3. Floors within atriums where the space adjacent to the atrium is included in the volume of the atrium for smoke control purposes.
4. Floors within malls.
5. Floors within open and enclosed parking ~~structures~~ garages constructed in accordance with Sections 406.3 and 406.4, respectively.
6. Mezzanine floors.
7. Walls that are permitted to have unprotected openings.
8. Roofs where openings are permitted.
9. Control joints not exceeding a maximum width of 0.625 inch (15.9 mm) and tested in accordance with ASTM E 119 or UL 263.

Reason: Exception 8 of Section 707.2 permits floor openings for automobile ramps in open and enclosed parking garages without shaft enclosures. If floor openings for ramps are unenclosed in enclosed garages, there is no logic in requiring fire-resistive joint systems for joints in floors of enclosed garages. The revised wording of Exception 5 is similar to existing text in Exception 8 of Section 707.2. The change from open parking "structure" to "garage" is consistent with the terminology used in Section 406.3.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The committee agreed that since floor openings for ramps are unenclosed in enclosed garages, as allowed in Exception 8 of Section 707.2, there is no logic in requiring fire-resistive joint systems for joints in floors of enclosed garages.

Assembly Action:

None

Final Hearing Results

FS102-07/08

AS

Code Change No: **FS103-07/08**

Original Proposal

Section: 713.1

Proponent: Tom Rubottom, City of Lakewood, CO, representing the Colorado Chapter of ICC

Revise as follows:

713.1 (Supp) General. Joints installed in or between fire-resistance-rated walls, floor or floor/ceiling assemblies and roofs or roof/ceiling assemblies shall be protected by an approved fire-resistant joint system designed to resist the passage of fire for a time period not less than the required fire-resistance rating of the wall, floor or roof in or between which it is installed. Fire-resistant joint systems shall be tested in accordance with Section 713.3. The void created at the intersection of a floor/ceiling assembly and an exterior curtain wall assembly shall be protected in accordance with Section 713.4.

Exception: Fire-resistant joint systems shall not be required for joints in all of the following locations:

1. Floors within a single dwelling unit.
2. Floors where the joint is protected by a shaft enclosure in accordance with Section 707.
3. Floors within atriums where the space adjacent to the atrium is included in the volume of the atrium for smoke control purposes.
4. Floors within malls.

5. Floors and ramps within open ~~parking structures~~ and enclosed parking garages or structures constructed in accordance with Sections 406.3 and 406.4, respectively.
6. Mezzanine floors.
7. Walls that are permitted to have unprotected openings.
8. Roofs where openings are permitted.
9. Control joints not exceeding a maximum width of 0.625 inch (15.9 mm) and tested in accordance with ASTM E 119 or UL 263.

Reason: Section 713.1 Exception 2 states, "Floors where the joint is protected by a shaft enclosure in accordance with Section 707". Section 707.2, Exception 8 states, "A shaft enclosure is not required for automobile ramps in open and enclosed parking garages constructed in accordance with Sections 406.3 and 406.4, respectively". The code is not clear that compliance with Exception 8 to Section 707.2; in turn is complying with Exception 2, to Section 713.1.

It makes no sense to permit the ramps or floors in open and enclosed parking facilities to open to the other levels with no protection; however require that the joints created between fire-resistance-rated walls, floor or floor/ceiling assemblies and roofs or roof/ceiling assemblies to be protected.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Errata: FS103-07/08: Revise exception 5 to Section 713.1 (Supp) by removing the strikeout from the word "open." Exception 5 should read as follows:

5. Floors and ramps within open ~~parking structures~~ and enclosed parking garages or structures constructed in accordance with Sections 406.3 and 406.4, respectively.

Committee Action:

Approved as Submitted

Committee Reason: Consistent with FS102-07/08, the committee agreed that since floor openings for ramps are unenclosed in enclosed garages, as allowed in Exception 8 of Section 707.2, there is no logic in requiring fire-resistive joint systems for joints in floors of enclosed garages.

Assembly Action:

None

Final Hearing Results

FS103-07/08

AS

Code Change No: FS110-07/08

Original Proposal

Section: 713.4

Proponent: Tony Crimi, AC Consulting Solutions Inc, representing North American Insulation Manufacturers' Association (NAIMA) and International Firestop Council

Revise as follows:

713.4 (Supp) Exterior curtain wall/floor intersection. Where fire resistance-rated floor or floor/ceiling assemblies are required, voids created at the intersection of the exterior curtain wall assemblies and such floor assemblies shall be sealed with an approved material or system to prevent the interior spread of fire. Such material or systems shall be securely installed and capable of preventing the passage of flame and hot gases sufficient to ignite cotton waste where subjected either to ASTM E 119 or UL 263 time-temperature fire conditions under a minimum positive pressure differential of 0.01 inch (0.254 mm) of water column (2.5 Pa) or installed as and tested in accordance with ASTM E 2307 to prevent the passage of flame for the time period at least equal to the fire-resistance rating of the floor assembly and prevent the passage of heat and hot gases sufficient to ignite cotton waste. Height and fire-resistance requirements for curtain wall spandrels shall comply with Section 704.9.

Reason #1: (NAIMA) To require perimeter fire barrier joint protection systems to be tested to confirm with ASTM Standard E2307 for determining Fire Resistance of Perimeter Fire Barrier Systems rather than continue to permit the outdated reference to ASTM E119.

Perimeter fire barrier systems are unique building construction details not specifically addressed by other fire test methods. The ASTM E2307 test method specifies criteria and methods to be used to determine the fire resistance of perimeter fire barrier systems. Reference to the existing provisions for testing in accordance with ASTM E119, under the conditions stipulated in IBC Section 713.4, was originally retained in order to allow Code users and manufacturers sufficient time to transition to the new test method. At this point, there is no reason to continue to do so.

Perimeter fire barrier systems are unique building construction details not specifically addressed by other fire test methods. ASTM Committee E5 completed the development of ASTM E2307 *Standard Test Method for Determining Fire Resistance of Perimeter Fire Barrier Systems Using Intermediate-Scale, Multi-story Test Apparatus* in March of 2004. A perimeter fire barrier system is the perimeter joint protection installed in the space between an exterior wall assembly and a floor assembly. Section 713.4 of the IBC currently addresses these exterior wall and floor intersections by requiring materials or systems to be securely installed and capable of preventing the passage of flame and hot gases sufficient to ignite cotton waste where subjected to ASTM E 119 time-temperature fire conditions under a specified minimum positive pressure. However, the ASTM E2307 Standard is clear in identifying that the perimeter fire barrier protection represents a complete system made of numerous material components. Reference to "materials" is not correct or appropriate.

The test method specifies criteria and methods to be used to determine the fire resistance of perimeter fire barrier systems using the intermediate-scale, multistory test apparatus (ISMA). The use of the multi-story test apparatus and this test method are specifically intended to simulate a possible fire exposure on a perimeter fire barrier system. Consequently, this new test method specifies the fire exposure conditions, methods of test, and criteria for evaluation of the ability of a perimeter fire barrier system to maintain the fire resistance where a floor and exterior wall assembly intersect to create a perimeter joint. The fire exposure used is that specified by the test method for the first 30 min of exposure, and then conforms to the Test Methods E 119 time-temperature curve for the remainder of the test in the test room.

ASTM 2307 measures the performance of the perimeter fire barrier system and its ability to maintain a seal to prevent fire spread during the deflection and deformation of the exterior wall assembly and floor assembly expected during a fire condition, while resisting fire exposure from both an interior compartment and from the flame plume emitted from a window burner below. The end point of the fire resistance test is the period of time elapsing before the first condition of compliance is reached as the perimeter fire barrier system is subjected to the time-temperature fire exposure. Having developed this test method, reference to the existing provisions for testing in accordance with ASTM E119, under the conditions stipulated in IBC Section 713.4, should be deleted as the IBC has allow Code users and manufacturers sufficient time to transition to the new test method.

Reason #2: (International Fire Stop Council) To require perimeter fire barrier joint systems to be tested to confirm with ASTM Standard E2307 for determining Fire Resistance of Perimeter Fire Barrier Systems rather than continue to permit the outdated reference to ASTM E119.

Perimeter fire barrier systems are unique building construction details not specifically addressed by other fire test methods. The ASTM E2307 test method specifies criteria and methods to be used to determine the fire resistance of perimeter fire barrier systems. Reference to the existing provisions for testing in accordance with ASTM E119, under the conditions stipulated in IBC Section 713.4, was originally retained in order to allow Code users and manufacturers sufficient time to transition to the new test method. At this point, there is no reason to continue to do so.

ASTM Committee E5 completed the development of ASTM E2307 *Standard Test Method for Determining Fire Resistance of Perimeter Fire Barrier Systems Using Intermediate-Scale, Multi-story Test Apparatus* in March of 2004. A perimeter fire barrier system is the perimeter joint protection installed in the space between an exterior wall assembly and a floor assembly. Section 713.4 of the IBC currently addresses these exterior wall and floor intersections by requiring such materials or systems to be securely installed and capable of preventing the passage of flame and hot gases sufficient to ignite cotton waste where subjected to ASTM E 119 time-temperature fire conditions under a specified minimum positive pressure.

Perimeter fire barrier systems are unique building construction details not specifically addressed by other fire test methods. The test method specifies criteria and methods to be used to determine the fire resistance of perimeter fire barrier systems using the intermediate-scale, multistory test apparatus (ISMA). The use of the multi-story test apparatus and this test method are specifically intended to simulate a possible fire exposure on a perimeter fire barrier system. Consequently, this new test method specifies the fire exposure conditions, methods of test, and criteria for evaluation of the ability of a perimeter fire barrier system to maintain the fire resistance where a floor and exterior wall assembly intersect to create a perimeter joint. The fire exposure used is that specified by the test method for the first 30 min of exposure, and then conforms to the Test Methods E 119 time-temperature curve for the remainder of the test in the test room.

ASTM 2307 measures the performance of the perimeter fire barrier system and its ability to maintain a seal to prevent fire spread during the deflection and deformation of the exterior wall assembly and floor assembly expected during a fire condition, while resisting fire exposure from both an interior compartment and from the flame plume emitted from a window burner below. The end point of the fire resistance test is the period of time elapsing before the first condition of compliance is reached as the perimeter fire barrier system is subjected to the time-temperature fire exposure. Having developed this test method, reference to the existing provisions for testing in accordance with ASTM E119, under the conditions stipulated in IBC Section 713.4, should be deleted as the IBC has allow Code users and manufacturers sufficient time to transition to the new test method.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The committee agreed that the single applicable standard to test exterior curtain wall and floor intersections is ASTM E2307. This standard, unlike ASTM E119 and UL 263, addresses the unique construction details associated with exterior curtain wall and floor intersections.

Assembly Action:

None

Final Hearing Results

FS110-07/08

AS

Code Change No: **FS111-07/08**

Original Proposal

Section: 713.4.1 (New)

Proponent: Tony Crimi, AC Consulting Solutions Inc, representing North American Insulation Manufacturers' Association (NAIMA)

Add new text as follows:

713.4.1 Exterior curtain wall & non fire-resistance rated floor assembly intersections. Voids created at the intersection of exterior curtain wall assemblies and non fire-resistance-rated floor or floor/ceiling assemblies shall be sealed with an approved material or system to prevent the interior spread of fire and the free passage of heat and hot gases.

Reason: To require some minimal level of protection of the void spaces located at the perimeter of a building between non-fire-resistance rated floor assemblies and exterior walls or curtain walls. This proposal would treat perimeter openings similar to the way in which Ducts and Penetration through non fire resistance rated horizontal assemblies are currently handled in the IBC.

Section 713.4 addresses the perimeter fire barrier joint for cases where the floor assemblies have a fire resistance rating. However, there is still a need to prevent the free passage of flame, heat and hot gases at the voids created around the perimeter of a floor assembly, even if the floor is not fire resistance rated. Reference to the existing provisions for testing in accordance with ASTM E2307 or ASTM E E119 in IBC Section 713.4, is not applicable to unrated floor assemblies.

The provisions of IBC Section 713.4 only apply to cases where fire resistance-rated floor or floor/ceiling assemblies are required. However, the risk of spread of flames, smoke, heat, and hot gases through the voids created at the intersection of the exterior curtain wall assemblies and unrated floor assemblies still exist. This proposed change is consistent with sections 716.6.3 dealing with Ducts through non fire resistance rated floor assemblies, and 712.4.2 the treatment of penetrations through non fire resistance rated floor assemblies. Both of these sections require the annular space around the penetrating duct to be protected with an approved noncombustible material that resists the free passage of flame and the products of combustion.

There are numerous examples of severe fires spreading through unprotected perimeter gaps created at the zone of interface between an exterior curtain walls and floor or floor/ceiling assemblies. Most notable among these are the First Interstate Bank Tower fire in Los Angeles in 1988 in which lack of any protection around the perimeter of the floor assemblies led to rapid spread of fire and smoke.

This code change proposal will add performance language which will provide minimum protection for these conditions by requiring some type of noncombustible material to be installed to prevent the interior spread of fire and the free passage of heat and hot gases.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Modified

Modify the proposal as follows:

713.4.1 Exterior curtain wall & non fire-resistance rated floor assembly intersections. Voids created at the intersection of exterior curtain wall assemblies and non fire-resistance-rated floor or floor/ceiling assemblies shall be sealed with an approved material or system to resist ~~prevent~~ the interior spread of fire and the free passage of heat and hot gases.

Committee Reason: The committee agreed that this type of protection is commonly provided and a typical construction practice; therefore adding the requirement to the code is appropriate and will be useful for the code official for enforcement purposes. The modification to replace the word "prevent" with "resist" seemed to be more appropriate based on the intent of the requirements.

Assembly Action:

None

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Rick Thornberry, The Code Consortium, Inc., representing Alcan Composites USA, Inc. requests Approval as Modified by this public comment.

Further modify proposal as follows:

713.4.1 Exterior curtain wall &/non fire-resistance rated floor assembly intersections. Voids created at the intersection of exterior curtain wall assemblies and non fire-resistance-rated floor or floor/ceiling assemblies shall be sealed with an approved material or system to ~~resist~~ retard the interior spread of fire ~~and the free passage of heat and hot gases~~ between stories.

Commenter's Reason: The purpose of this Public Comment is to further clarify this new section for the protection of the voids created at the intersection of exterior curtain wall assemblies and non-fire-resistance rated floor assemblies. The revisions to the title of the subsection are proposed to be consistent with the title of Section 713.4 and are strictly editorial. Editorial revisions have also been made to the text of the subsection to be consistent with the text in Section 717.2.1 Fireblocking Materials. And the text has been further modified to indicate that the purpose of the protection of the void at the intersection is to retard the interior spread of fire between stories. We believe these revisions are appropriate since this type of protection for nonrated types of construction is similar in concept to fireblocking in combustible construction.

Final Hearing Results

FS111-07/08

AMPC

Code Change No: FS112-07/08

Original Proposal

Section: 713.6

Proponent: Tony Crimi, AC Consulting Solutions Inc., representing International Firestop Council

Revise as follows:

713.6 Fire-resistant joint systems in smoke barriers. Fire-resistant joint systems in smoke barriers, and joints at the intersection of a horizontal smoke barrier and an exterior curtain wall, shall be tested in accordance with the requirements of UL 2079 for air leakage. The air leakage rate of the joint shall not exceed 5 cfm per lineal foot (0.00775 m³/s • m) of joint at 0.30 inch (7.47 Pa) of water for both the ambient temperature and elevated temperature tests.

Reason: To require perimeter joints installed at the intersection of exterior curtain wall and horizontal smoke barriers to have the same minimum performance requirement for smoke leakage that currently exists for penetrations and joints in the remainder of the smoke barriers.

When the IBC was updated to require leakage ratings for penetrations and joints in smoke barriers, the joints located at the intersection of the horizontal smoke barrier and the exterior curtain wall were not specifically addressed. Perimeter fire barrier systems are unique building construction details which are required to comply with Section 713.4. This Code change proposal is intended to provide that consistency.

This proposed code change would clarify that the IBC requirements for leakage rating of joints in smoke barriers (Section 713.6) also apply to the perimeter joints installed at the intersection of the exterior curtain wall assemblies and the horizontal smoke barrier. Perimeter fire barrier systems are unique building construction details not specifically addressed by other fire test methods. The current requirements in the IBC specify criteria and methods to be used to determine the fire resistance of perimeter fire barrier systems using either the intermediate-scale, multistory test apparatus (ISMA), or ASTM E119 time-temperature fire conditions. The test criteria for leakage rating of these joints is contained in UL 2079.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The committee agreed that a listed fire-resistant joint system is required at the junction of a horizontal smoke barrier and a curtain wall; therefore the proposed language is appropriate.

Assembly Action:

None

Final Hearing Results

FS112-07/08

AS

Code Change No: **FS113-07/08**

Original Proposal

Section: 714.1.1

Proponent: Maureen Traxler, City of Seattle, WA, representing Washington Association of Building Officials Technical Code Development Committee

Revise as follows:

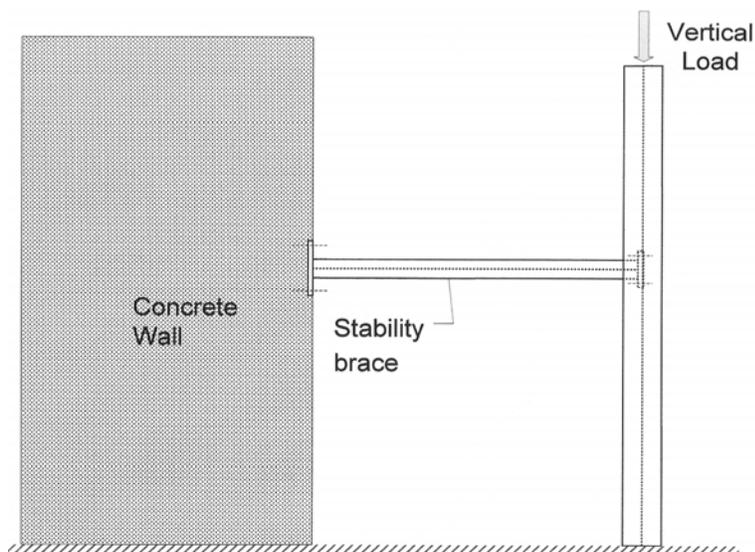
714.1.1 (Supp) Primary structural frame. The primary structural frame shall be is the columns and other structural members including the girders, beams, trusses and spandrels having direct connections to the columns and bracing members designed to carry gravity loads. Bracing members that are essential to the vertical stability of the primary structural frame under gravity loading shall be considered part of the primary structural frame whether or not the bracing member carries gravity loads.

Reason: The purpose of this code change is to clarify the code provisions regarding what portions of the structure should be considered “primary structural frame”, and therefore, require a fire-resistive rating.

The current language is clear in its intent that bracing members that carry only lateral loads (wind or earthquake) are not required to have a fire-resistive rating. Bracing members that carry vertical (gravity) loads as well as lateral loads are required to have a fire-resistive rating. However, the code is silent on bracing members that contribute to the overall stability of the building under gravity loading, but do not directly carry gravity loads.

The figure below illustrates an example where a brace is used to shorten the effective length of a column, preventing the column from buckling under gravity loads. The brace is not directly carrying gravity loads, but under full design loads, if it were not there, the column would fail (assuming the members are designed to the minimum size allowed). In a fire, the brace could be subjected to the same fire conditions as the column. Yet, under the current language in the code, there is no requirement to protect it. So if the fire causes the brace to fail, regardless of what fire-resistive rating is required for the column, the column will also fail.

The proposed language addresses this issue by including these types of braces in the definition of “primary structural frame”. Logically, if the column is required to have a fire-resistance rating, in order for the column to perform as expected, the brace should be protected to the same degree.



Cost Impact: The code change proposal will increase the cost of construction, but only marginally.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The committee indicated that bringing in vertical stability requirements to the primary structural frame was an appropriate technical clarification. The effective length of columns can be increased with proper fire-resistance rated protection provided to the bracing member(s) that are provided to achieve the longer effective length.

Assembly Action:

None

Final Hearing Results

FS113-07/08

AS

Code Change No: FS115-07/08

Original Proposal

Table 601, Section: 704.8.1, 714.1, 714.1.1, 714.1.2, 714.4, 714.2, 714.2.1, 714.3, 714.6

Proponent: Philip Brazil, PE, Reid Middleton, Inc., representing himself

THESE PROPOSALS ARE ON THE AGENDA OF THE IBC FIRE SAFETY AND THE IBC GENERAL CODE DEVELOPMENT COMMITTEES AS 2 SEPARATE CODE CHANGES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IBC FIRE SAFETY

Revise as follows:

704.8.1 (Supp) Allowable area of openings. The maximum area of unprotected and protected openings permitted in an exterior wall in any story of a building shall not exceed the percentages specified in Table 704.8.

Exceptions:

1. In other than Group H occupancies, unlimited unprotected openings are permitted in the first story above grade either:
 - 1.1. Where the wall faces a street and has a fire separation distance of more than 15 feet (4572 mm); or
 - 1.2. Where the wall faces an unoccupied space. The unoccupied space shall be on the same lot or dedicated for public use, shall not be less than 30 feet (9144 mm) in width, and shall have access from a street by a posted fire lane in accordance with the *International Fire Code*.
2. Buildings whose exterior bearing walls, exterior nonbearing walls and exterior primary structural frame are not required to be fire-resistance rated shall be permitted to have unlimited unprotected openings.

714.1 (Supp) Requirements. The fire-resistance ratings of structural members ~~and assemblies~~ shall comply with this section and the requirements for the type of construction as specified in Table 601 ~~and~~. The fire-resistance ratings shall not be less than the ratings required for the fire-resistance-rated assemblies supported by the structural members.

Exception: Fire barriers, fire partitions, smoke barriers and horizontal assemblies as provided in Sections 706.5, 708.4, 709.4 and 711.4, respectively.

714.1.1 (Supp) Primary structural frame. The primary structural frame shall ~~be~~ include all of the following structural members:

1. ~~The columns and other ;~~
2. ~~Structural members including the girders, beams, trusses and spandrels having direct connections to the columns, including girders, beams, trusses and spandrels;~~
3. Members of the floor construction and roof construction having direct connections to the columns; and
4. Bracing members designed to carry gravity loads.

714.2 714.1.2 (Supp) Secondary members. ~~The following structural members of floor or roof construction that are not connected to the columns shall be considered secondary members and not part of the primary structural frame;~~

1. Structural members not having direct connections to the columns;
2. Members of the floor construction not having direct connections to the columns; and
3. Bracing members not designed to carry gravity loads.

714.4 714.2 (Supp) Column protection. ~~Where columns are required to be fire-resistance rated, the entire column, including its connections to beams or girders, shall be provided individual encasement protection by protecting it on all sides for the full column length, including connections to other structural members, with materials having the required fire-resistance rating. Where the column extends through a ceiling, the fire-resistance rating of the column encasement protection shall be continuous from the top of the foundation or floor/ceiling assembly below through the ceiling space to the top of the column.~~

714.2 714.3 (Supp) Individual encasement protection Protection of the primary structural frame other than columns. ~~Girders, trusses, beams, lintels or other structural members of the primary structural frame other than columns that are required to have a fire-resistance rating and that support more than two floors or one floor and roof, or support a load-bearing wall or a nonload-bearing wall more than two stories high, shall be individually protected provided individual encasement protection by protecting them on all sides for the their full length, including connections to other structural members, with materials having the required fire resistance rating.~~

Exception: Individual encasement protection on all sides shall be permitted on all exposed sides provided the extent of protection is in accordance with the required fire-resistance rating, as determined in Section 703.

714.2.4 714.4 (Supp) Alternative Protection of secondary members. ~~The structural Secondary members that are required to have a fire-resistance rating and are not required to be provided individual encasement protection according to Section 714.2 shall be protected by individual encasement protection, by a the membrane or ceiling protection as specified in of a horizontal assembly in accordance with Section 711, or by a combination of both.~~

714.3 714.4.1 (Supp) Membrane protection Light-frame construction. ~~King studs and boundary elements that are integral elements in load-bearing walls of light-framed construction shall be permitted to have required fire-resistance ratings provided by the membrane protection provided for the load-bearing wall.~~

(Renumber Sections 714.2.3-714.2.5 as Sections 714.5-714.7, and Sections 714.3-714.5 as Sections 714.8-714.10)

714.6 714.11 Bottom flange protection. ~~Fire protection is not required at the bottom flange of lintels, shelf angles and plates, spanning not more than 6 feet (1829 mm) whether part of the primary structural frame or not, and from the bottom flange of lintels, shelf angles and plates not part of the primary structural frame, regardless of span.~~

(Renumber subsequent sections)

PART II – IBC GENERAL

Revise table as follows:

TABLE 601 (Supp)
FIRE-RESISTANCE RATING REQUIREMENTS FOR BUILDING ELEMENTS (hours)

BUILDING ELEMENT	TYPE I		TYPE II		TYPE III		TYPE IV	TYPE V	
	A	B	A ^d	B	A ^d	B	HT	A ^d	B
Primary structural frame ^g See Section 714.1.1 Including columns, girders, trusses	3 ^a	2 ^a	1	0	1	0	HT	1	0
Bearing walls Exterior ^{f, g} Interior	3 3 ^a	2 2 ^a	1 1	0 0	2 1	2 0	2 1/HT	1 1	0 0
Nonbearing walls and partitions Exterior	See Table 602								
Nonbearing walls and partitions Interior ^e	0	0	0	0	0	0	See Section 602.4.6	0	0
Floor construction <u>and secondary</u> <u>members</u> See Sections 714.1.1 and 714.1.2 Including supporting beams and joists	2	2	1	0	1	0	HT	1	0
Roof construction <u>and secondary</u> <u>members</u> See Sections 714.1.1 and 714.1.2 Including supporting beams and joists	1-½ ^b	1 ^{b, c}	1 ^{b, c}	0 ^{b, c}	1 ^{b, c}	0 ^{b, c}	HT	1 ^{b, c}	0

For SI: 1 foot = 304.8 mm.

- Roof supports: Fire-resistance ratings of primary structural frame and bearing walls are permitted to be reduced by 1 hour where supporting a roof only.
- Except in Group F-1, H, M and S-1 occupancies, fire protection of structural members shall not be required, including protection of roof framing and decking where every part of the roof construction is 20 feet or more above any floor immediately below. Fire-retardant-treated wood members shall be allowed to be used for such unprotected members.
- In all occupancies, heavy timber shall be allowed where a 1-hour or less fire-resistance rating is required.
- An approved automatic sprinkler system in accordance with Section 903.3.1.1 shall be allowed to be substituted for 1-hour fire-resistance-rated construction, provided such system is not otherwise required by other provisions of the code or used for an allowable area increase in accordance with Section 506.3 or an allowable height increase in accordance with Section 504.2. The 1-hour substitution for the fire resistance of exterior walls shall not be permitted.
- Not less than the fire-resistance rating required by other sections of this code.
- Not less than the fire-resistance rating based on fire separation distance (see Table 602).
- Not less than the fire-resistance rating as referenced in Section 714.5

Reason: The purpose for this proposal is to make the provisions approved by Proposal FS98-06/07-AS more technically sound and to improve coordination with other provisions of the IBC. Reference to "columns, girders and trusses" in the item under "Building Element" for primary structural frame" in Table 601 is deleted because it is effectively replaced by the reference to Section 714.1.1 and conflicts with the references in Section 714.1.1 to columns, girders, beams, trusses and spandrels.

In Section 714.1, "and assemblies" is deleted because the subject of Section 714.1 is structural members, not assemblies, which implies floor, roof or wall assemblies. The other revisions are editorial. Note that "structural member" is not currently defined in the IBC.

The revision to Section 714.1.1 may appear editorial but it is being done to make it clear which components of the structure are part of the primary structural frame. The current language implies that, in addition to columns and bracing members designed to carry gravity loads, only girders, beams, trusses and spandrels having direct connections to the columns are part of the primary structural frame. The intent, however, is that, in addition to columns, all structural members having direct connections to the columns, including structural members of the floor construction and roof construction and bracing members that are designed to carry gravity loads, are part of the primary structural frame. The listing of girders, beams, trusses and spandrels in Section 714.1.1 should be viewed as examples of such structural members.

Section 714.1.1 is also revised to specify all members of the primary structural frame as structural members. This revision makes it clear that bracing members are structural members and reduces questions over the scope of Section 714.1, which specifies structural members but not bracing members. Structural members of the floor construction and roof construction having direct connections to the columns are also identified as members of the primary structural frame. This revision correlates Section 714.1.1 with Section 714.1.2 on secondary members, which specifies members of the floor construction and roof construction not connected to columns.

Section 714.1.2 is revised because the current language does not make it clear whether structural members not having direction connections to the columns and bracing members not designed to carry gravity loads are members of the floor or roof construction such that they are considered secondary members. The current language also creates a gap between what structural members are considered part of the primary structural frame and what are considered secondary members. This gap consists of a third group of structural members that are neither part of

the primary structural frame nor secondary members. Section 714.1.2 is revised to close this gap by clearly specifying what structural members are secondary members, including structural members not having direct connections to the columns as structural members and bracing members not designed to carry gravity loads.

Also in Section 714.1.2, members of the floor or roof construction “not connected” to the columns is changed to “not having direct connections” to the columns to make it clear that structural members indirectly connected via supporting beams or girders that are directly connected to the columns are not intended to be members of the primary structural frame. Note that horizontal bracing members typically are part of the floor or roof construction. The format of Section 714.1.2 is revised to specify individual items in the same manner as Section 714.1.1.

In conjunction with the proposed changes to Section 714.1.2, secondary members are added to the listings of floor construction and roof construction in Table 601 along with references to Sections 714.1.1 and 714.1.2 in the same manner as the listing for primary structural frame. With the approval of FS98-06/07, secondary members become a distinct type of building element and should be specified in Table 601 along with primary structural frame.

The order of the technical provisions in Section 714 is revised. The primary structural frame consists of the columns with the most restrictive technical provisions (Section 714.4), other members of the primary structural frame with technical provisions that are less restrictive than columns (Section 714.3), and secondary members with technical provisions that are less restrictive than the primary structural frame (Section 714.2.1). These sections are rearranged beginning with the most restrictive: columns in Section 714.2, primary structural frame members other than columns in Section 714.3 and secondary members in Section 714.4.

References to individual encasement protection are clarified. Renumbered Sections 714.2 and 714.3 (current Sections 714.4 and 714.2) reference individual encasement protection but neither section contains technical provisions for it. Also, the title of renumbered Section 714.3 is “individual encasement protection” but the provisions in the section do not mention it. Instead, individual protection on all sides of the structural member for its full length, including connections to other structural members, is specified. If individual encasement protection is the intent, it is not achieved by reliance on the title of the section, which is nonmandatory. Renumbered Sections 714.2 and 714.3 are revised by specifying individual encasement protection as individual protection on all sides of the structural member for its full length, including connections to other structural members, with materials having the required fire-resistance rating.

An exception is added to renumbered Section 714.3 (current Section 714.2) on primary structural frame members other than columns. Beams and girders typically support floor or roof construction, which prevents the protection of their surfaces that bear against floor or roof members (i.e., steel decks). The exception permits the protection on all sides to be only on exposed sides provided the assembly being relied on for the required fire resistance rating limits protection to the exposed sides.

“Structural frame” in Item (a) of Table 601, Section 704.8.1 (Exception 2) and Section 714.6 (Section 714.11 in proposal) is changed to “primary structural frame” for better consistency with the changes approved by FS98-06/07. With these changes a clear distinction will be established between “primary structural frame” in the nonstructural provisions of the IBC and “structural frame” in the structural provisions. The use of “structural frame” is found in Sections 2104.2.1, 2109.4.3, 2109.7.4, 2110.1.1, 3402.1 (technically infeasible) and H109.1.

Additional references to the footnotes in Table 601 at the fire-resistance ratings for roof construction in Table 601 are made to restore the original references, which were inadvertently deleted in the 2007 IBC Supplement. Note that Footnotes (c) and (d) in the 2006 IBC are Footnotes (b) and (c) in the 2007 IBC Supplement.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

PART I – IBC FIRE SAFETY

Committee Action:

Approved as Modified

Modify the proposal as follows:

714.1 (Supp) Requirements. The fire-resistance ratings of structural members and assemblies shall comply with this section and the requirements for the type of construction as specified in Table 601. The fire-resistance ratings shall not be less than the ratings required for the fire-resistance-rated assemblies supported by the structural members.

(Portions of the proposal not shown remain unchanged)

Committee Reason: The committee felt that the reorganization of Section 714 orders the requirements to create a more user-friendly code, for both the designer and the code official. The modification put back the words “and assemblies” to cover items other than structural members.

Assembly Action:

None

PART II – IBC GENERAL

Committee Action:

Disapproved

Committee Reason: Part II of the proposal was heavily dependant upon the action on Part I, which at the time of the IBC General Committee hearings had not been discussed yet.

Assembly Action:

None

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because public comments were submitted.

Public Comment 1:

Paul K. Heilstedt, PE, FAIA, Chair, representing ICC Code Technology Committee (CTC), requests Approval as Modified by this public comment for Part I.

Modify proposal as follows:

714.1.1 (Supp) Primary structural frame. The primary structural frame shall include all of the following structural members:

1. The columns;
2. Structural members having direct connections to the columns, including girders, beams, trusses and spandrels;
3. Members of the floor construction and roof construction having direct connections to the columns; and
4. ~~Bracing members designed to carry gravity loads.~~ Bracing members that are essential to the vertical stability of the primary structural frame under gravity loading shall be considered part of the primary structural frame whether or not the bracing member carries gravity loads.

714.1.2 (Supp) Secondary members. The following structural members shall be considered secondary members and not part of the primary structural frame:

1. Structural members not having direct connections to the columns;
2. Members of the floor construction not having direct connections to the columns; and
3. ~~Bracing members not designed to carry gravity loads.~~ Bracing members other than those that are part of the primary structural frame in accordance with Section 714.1.1

(Portions of proposal not shown remain unchanged)

Commenter's Reason: The purpose of this public comment is to coordinate the code committee's action on code changes FS 113 and FS 115. Code change FS 113 included technical revisions to the primary structural frame provisions of Section 714.1.1 while FS 115 is primarily an editorial re-formatting of Section 714.

Specifically, approved code change FS 113 revised the requirements for bracing considered part of the structural frame of the building. The approved language from FS 113 has been incorporated in Item 4 to Section 714.1.1. In order to coordinate this change, Item 3 to Section 714.1.2 needs to be revised to clarify that bracing which is not part of the structural frame is not limited to bracing which is not designed to carry gravity loads.

Code issues are assigned to the CTC by the ICC Board as "areas of study". Information on the CTC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CTC effort can be downloaded from the following website: <http://www.iccsafe.org/cs/cc/ctc/index.html>. Since its inception in April/2005, the CTC has held fifteen meetings - all open to the public. This public comment is a result of the CTC's investigation of the area of study entitled "NIST World Trade Center Recommendations". The CTC web page for this area of study is: <http://www.iccsafe.org/cs/cc/ctc/WTC.html>

Public Comment 2:

Maureen Traxler, City of Seattle, Department of Planning and Development, representing Washington Association of Building Officials Technical Code Development Committee, requests Approval as Modified by this public comment for Part I.

Modify proposal as follows:

Section 202 ~~714.1.1~~ (Supp) Primary structural frame. The primary structural frame shall include all of the following structural members:

1. The columns;
2. Structural members having direct connections to the columns, including girders, beams, trusses and spandrels;
3. Members of the floor construction and roof construction having direct connections to the columns; and
4. Bracing members designed to carry gravity loads.

Section 202 ~~714.1.2~~ (Supp) Secondary members. The following structural members shall be considered secondary members and not part of the primary structural frame:

1. Structural members not having direct connections to the columns;
2. Members of the floor construction not having direct connections to the columns; and
3. Bracing members not designed to carry gravity loads.

(Portions of proposal not shown remain unchanged)

Commenter's Reason: Sections 714.1.1 and 714.1.2 function as definitions of "primary structural frame" and "secondary members". We are proposing to clearly identify them as definitions to make it obvious to code users that the terms are defined. The terms are used in both Chapters 6 and 7, and, therefore, should be located in Chapter 2. If the definition is located in Chapter 2 it is obvious that the definition applies to both chapters.

This item is on the agenda for individual consideration because a public comment was submitted for Part II.

Public Comment:

Maureen Traxler, City of Seattle Department of Planning and Development, representing Washington Association of Building Officials Technical Code Development Committee, requests Approval as Modified by this public comment.

Modify proposal as follows:

TABLE 601 (Supp)
FIRE-RESISTANCE RATING REQUIREMENTS FOR BUILDING ELEMENTS (hours)

BUILDING ELEMENT	TYPE I		TYPE II		TYPE III		TYPE IV	TYPE V	
	A	B	A ^d	B	A ^d	B	HT	A ^d	B
Primary structural frame ^g See Section 714.1.1 and 714.1.2 202	3 ^a	2 ^a	1	0	1	0	HT	1	0
Bearing walls Exterior ^{f, g}	3	2	1	0	2	2	2	1	0
Interior	3 ^a	2 ^a	1	0	1	0	1/HT	1	0
Nonbearing walls and partitions Exterior	See Table 602								
Nonbearing walls and partitions Interior ^e	0	0	0	0	0	0	See Section 602.4.6	0	0
Floor construction and secondary members See Sections 714.1.1 and 714.1.2 202	2	2	1	0	1	0	HT	1	0
Roof construction and secondary members See Sections 714.1.1 and 714.1.2 202	1-1/2 ^b	1 ^{b, c}	1 ^{b, c}	0 ^{b, c}	1 ^{b, c}	0 ^{b, c}	HT	1 ^{b, c}	0

- a. Roof supports: Fire-resistance ratings of primary structural frame and bearing walls are permitted to be reduced by 1 hour where supporting a roof only.
- b. through g. (No change)

Commenters Reason: Sections 714.1.1 and 714.1.2 function as definitions of “primary structural frame” and “secondary members”. We are proposing to clearly identify them as definitions to make it obvious to code users that the terms are defined. The terms are used in both Chapters 6 and 7, and, therefore, should be located in Chapter 2. If the definition is located in Chapter 2 it is obvious that the definition applies to both chapters.

Final Hearing Results

FS115-07/08, Part I AMPC1, 2
FS115-07/08, Part II AMPC

Code Change No: FS116-07/08

Original Proposal

Section: 714.4

Proponent: Donald R. Monahan, Walker Parking Consultants, representing Parking Consultants Council of the National Parking Association

Revise as follows:

714.4 Impact protection. Where the fire protective covering of a structural member is subject to impact damage from moving vehicles, the handling of merchandise or other activity, the fire protective covering shall be protected by corner guards or by a substantial jacket of metal or other noncombustible material to a height adequate to provide full protection, but not less than 5 feet (1524 mm) from the finished floor.

Exception: Corner protection is not required on concrete columns in open or enclosed parking garages.

Reason: This code change is intended to clarify the impact protection requirements to preserve the fire rating for concrete columns in parking garages.

Concrete is a durable material that is not susceptible to damage from moving vehicles at the relatively low speeds in a parking garage. Further, the structural concrete members are designed to resist such impact. Therefore, supplemental impact protection should not be required.

The proponent has 30 years of experience in parking garage design and restoration and has not observed any problems with damage to concrete columns from moving vehicles in parking garages. Further, the vast experience of the 52 members of the Parking Consultants Council of the National Parking Association indicates that corner guards are not necessary in concrete parking structures. Corner guards have seldom been provided in over 3000 parking garages designed by Walker Parking Consultants.

Also, data from the National Fire Incident Reporting System indicates that fires in parking structures are an infrequent occurrence, that they typically do not spread, and that damage to the structural members from vehicle fires is minimal. Therefore, an infrequent chip off a concrete column is not likely to cause significant exposure to fire damage of the concrete column.

The requirement to add corner guards increases the cost of the parking structure by approximately \$0.50 per sf. Per 2007 R.S. Means Square Foot Costs, the corner guards are approximately \$25 per lineal foot installed. For a 5 foot height, the cost per each corner guard is \$125. On a recent project in San Diego at Children's Hospital, there are 66 columns on 5 levels requiring two corner guards and 33 columns on five levels requiring 4 corner guards or 264 corner guards per level. There were then 1320 corner guards required at a cost of \$125 each or a total cost of \$165,000. The total cost is approximately \$0.49 per sf. This cost is an unnecessary expense and does not increase the benefit to life safety in a concrete parking structure.

Cost Impact: This code change proposal will not increase the cost of construction - see the last paragraph of the reason statement above.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The committee agreed that the structural integrity of a concrete column supporting a parking garage is sufficiently robust so as not to require impact protection (corner guards).

Assembly Action:

None

Final Hearing Results

FS116-07/08

AS

Code Change No: FS118-07/08

Original Proposal

Section: 714

Proponent: Sarah A. Rice, Schirmer Engineering

Revise as follows:

(Entire section relocated from Section 714 and renumbered to Section 704)

**SECTION ~~714~~ 704
FIRE-RESISTANCE RATING OF STRUCTURAL MEMBERS**

(Entire section relocated from Section 704 and renumbered to Section 705)

**SECTION ~~704~~ 705
EXTERIOR WALLS**

(Entire section relocated from Section 705 and renumbered to Section 706)

**SECTION ~~705~~ 706
FIRE WALLS**

(Entire section relocated from Section 706 and renumbered to Section 707)

**SECTION ~~706~~ 707
FIRE BARRIERS**

(Entire section relocated from Section 707 and renumbered to Section 708)

**SECTION ~~707-708~~
SHAFT ENCLOSURES**

(Entire section relocated from Section 708 and renumbered to Section 709)

**SECTION ~~708~~ 709
FIRE PARTITIONS**

(Entire section relocated from Section 709 and renumbered to Section 710)

**SECTION ~~709~~ 710
SMOKE BARRIERS**

(Entire section relocated from Section 710 and renumbered to Section 711)

**SECTION ~~710~~ 711
SMOKE PARTITIONS**

(Entire section relocated from Section 711 and renumbered to Section 712)

**SECTION ~~711~~ 712
HORIZONTAL ASSEMBLIES**

(Entire section relocated from Section 712 and renumbered to Section 713)

**SECTION ~~712~~ 713
PENETRATIONS**

(Entire section relocated from Section 713 and renumbered to Section 714)

**SECTION ~~713~~ 714
FIRE-RESISTANT JOINT SYSTEMS**

Reason: The material contained in Section 714 Fire-resistance Rating of Structural Members is a fundamental provision applicable to all types of fire rated assemblies. It would seem to be something that the user should find right away when reading Chapter 7. As there are no references to Section 714 in any of the specific sections covering specific types of assemblies, it's relocation to the beginning of Chapter 7 seems reasonable.

The order of Chapter 7 would then be:

- 701 General
- 702 Definitions
- 703 Fire Resistance Ratings and Fire Tests
- 704 Fire Resistance Rating of Structural Members
- 705 Exterior Walls
- 706 Fire Walls
- 707 Fire Barriers
- 708 Shaft Enclosures
- 709 Fire Partitions
- 710 Smoke Barriers
- 711 Smoke Partitions

Etc.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The committee agreed that the requirements contained in Section 714 Fire-resistance Rating of Structural Members are applicable to all types of fire rated assemblies; therefore it's relocation to the beginning of Chapter 7 seems appropriate.

Assembly Action:

None

Final Hearing Results

FS118-07/08

AS

Code Change No: **FS120-07/08**

Original Proposal

Sections: 715.4, 715.4.5 (New)

Proponent: William F. O'Keeffe, SAFTIFIRST

1. Revise as follows:

715.4 Fire door and shutter assemblies. Approved fire door and fire shutter assemblies shall be constructed of any material or assembly of component materials that conforms to the test requirements of Section 715.4.1, 715.4.2 or 715.4.3 and the fire-protection rating indicated in Table 715.4. Fire door frames with transom lights, sidelights or both shall comply with Section 715.4.5. Fire door assemblies and shutters shall be installed in accordance with the provisions of this section and NFPA 80.

Exceptions:

1. Labeled protective assemblies that conform to the requirements of this section or UL 10A, UL 14B and UL 14C for tin-clad fire door assemblies.
2. Floor fire door assemblies in accordance with Section 711.8.

2. Add new text as follows:

715.4.5 Fire door frames with transom lights and sidelights. Door frames with transom lights, sidelights, or both shall be permitted where a ¾-hour fire protection rating or less is required in accordance with Table 715.4. Where a fire protection rating exceeding ¾-hour is required in accordance with Table 715.4, fire door frames with transom lights, sidelights, or both, shall be installed with fire-resistance rated glazing tested as an assembly in accordance with ASTM E119.

(Renumber subsequent sections)

Reason: The proposed text is consistent with NFPA 80 (2006) provisions 6.3.3.3 and 6.3.3.4, which specify the limitations on door frames with transom and sidelights. NFPA 80 was revised in the 2006 revision cycle to clarify that door frames with transom and sidelights installed with fire resistance-rated glazing tested to NFPA 251 (ASTM E119) are permitted where a fire protection rating exceeding ¾-hour is required. This code revision brings the NFPA 80 clarification of the limitations on sidelight and transom door frames into the IBC, where code enforcers and other code users can readily identify the limits, rather than having to refer to NFPA 80.

This code change is needed to address the current confusion by code users that fire protection rated glazing listed for use in door and frames rated in excess for ¾-hours are permitted, when they are not. The use of fire protection rated glazing materials that do not meet the temperature rise limits of ASTM E119 compromise fire safety where door openings are needed for egress in fire wall assemblies requiring 1-hour or above door opening protection.

Cost Impact: This is a clarification of the code and will have no cost impact.

Public Hearing Results

Committee Action:

Approved as Modified

Modify the proposal as follows:

715.4 Fire door and shutter assemblies. Approved fire door and fire shutter assemblies shall be constructed of any material or assembly of component materials that conforms to the test requirements of Section 715.4.1, 715.4.2 or 715.4.3 and the fire-protection rating indicated in Table 715.4. Fire door frames with transom lights, sidelights or both shall comply be permitted in accordance with Section 715.4.5. Fire door assemblies and shutters shall be installed in accordance with the provisions of this section and NFPA 80.

Exceptions:

1. Labeled protective assemblies that conform to the requirements of this section or UL 10A, UL 14B and UL 14C for tin-clad fire door assemblies.
2. Floor fire door assemblies in accordance with Section 711.8.

715.4.5 Fire door frames with transom lights and sidelights. Door frames with transom lights, sidelights, or both shall be permitted where a ¾-hour fire protection rating or less is required in accordance with Table 715.4. Where a fire protection rating exceeding ¾-hour is required in accordance with Table 715.4, fire door frames with transom lights, sidelights, or both, shall be permitted where installed with fire-resistance rated glazing tested as an assembly in accordance with ASTM E119 or UL 263.

Committee Reason: The committee agreed that requirements specific to fire door frames with transom lights and sidelights needed to be addressed in the code. Further, the committee agreed that the technical requirements were appropriate and based on NFPA 80. The modifications were to opt for more appropriate code language, language consistencies with NFPA 80 and to add an appropriate referenced to an alternative standard (UL 263) referenced elsewhere in the code.

Assembly Action:

None

Final Hearing Results

FS120-07/08

AM

Code Change No: FS121-07/08

Original Proposal

Section: 715.4.3

Proponent: A. Brooks Ballard, Virginia Department of Corrections

Revise as follows:

715.4.3 Door assemblies in corridors and smoke barriers. Fire door assemblies required to have a minimum fire protection rating of 20 minutes where located in corridor walls or smoke-barrier walls having a fire-resistance rating in accordance with Table 715.4 shall be tested in accordance with NFPA 252 or UL 10C without the hose stream test.

Exceptions:

1. Viewports that require a hole not larger than 1 inch (25 mm) in diameter through the door, have at least a 0.25-inch-thick (6.4 mm) glass disc and the holder is of metal that will not melt out where subject to temperatures of 1,700°F (927°C).
2. Corridor door assemblies in occupancies of Group I-2 shall be in accordance with Section 407.3.1.
3. Unprotected openings shall be permitted for corridors in multitheater complexes where each motion picture auditorium has at least one-half of its required exit or exit access doorways opening directly to the exterior or into an exit passageway.
4. Horizontal sliding doors in smoke barriers that comply with 408.3 and 408.7.4 in occupancies in Group I-3.

Reason: Horizontal sliding doors are frequently used when highest security is required and in high usage situations in detention and correctional facilities. Exception 4 allows the use of horizontal sliding doors in smoke barriers for Use Group I-3 occupancies in accordance with Section 410.0. This exception recognizes that many security doors are of the sliding type. Swinging doors may present a concern in the operation of such facilities since they can more easily be blocked from opening and used as a weapon. Horizontal sliding doors are allowed in Group I-3 by Section 1008.1.2 and are an integral part of maintaining the security necessary in buildings containing this type of occupant. This exception will allow proper levels of security to be maintained in the highest security areas without compromising occupant life safety in the buildings.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The committee agreed that horizontal sliding doors are allowed in Group I-3 by Section 1008.1.2 and are an integral part of maintaining the security in buildings of this type. This exception will allow proper levels of security to be maintained in these types of buildings without compromising occupant life safety.

Assembly Action:

None

Final Hearing Results

FS121-7/08

AS

Code Change No: **FS136-07/08**

Original Proposal

Sections: 715.5.7, 715.5.7.1, 715.5.7.2

Proponent: William O'Keeffe, SAFIFIRST

Revise as follows:

715.5.7 Interior fire window assemblies. Fire-protection-rated glazing used in fire window assemblies located in fire partitions and fire barriers shall be limited to use in assemblies with a maximum fire-resistance rating of 1 hour in accordance with this section.

715.5.7.1 Where 3/4-hour fire protection window assemblies permitted. Fire-protection-rated glazing requiring 45-minute opening protection in accordance with Table 715.5 shall be limited to fire partitions designed in accordance with Section 708 and fire barriers utilized in the applications set forth in Sections 706.3.6 and 706.3.8 where the fire-resistance rating does not exceed 1 hour.

715.5.7.2 Size Area limitations. The total area of windows shall not exceed 25 percent of the area of a common wall with any room.

Reason: This is a clarification of the code to specifically address the rating requirements for interior windows. Additionally, the more correct terminology for section 715.5.7.3 should be "area" limits, rather than "size" limits.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The committee agreed that this proposal clarifies the code by specifically addressing the rating requirements for interior windows by providing a specific reference to Table 715.5.

Assembly Action:

None

Final Hearing Results

FS136-07/08

AS

Code Change No: **FS137-07/08**

Original Proposal

Sections: 716.2.1 (IMC [B] 607.2.1)

Proponent: Raymond A. Grill, PE, Arup, representing himself

Revise as follows:

716.2.1 (IMC [B] 607.2.1) Smoke control system. Where the installation of a fire damper will interfere with the operation of a required smoke control system designed in accordance with Section 909, approved alternative protection shall be utilized. Where mechanical systems including ducts and dampers utilized for normal building ventilation serve as part of the smoke control system, the expected performance of these systems in smoke control mode shall be addressed in the rational analysis required by Section 909.4.

Reason: This change is intended to clarify the code. The current language has been interpreted to not allow the building HVAC system to be utilized as part of a smoke control system. The change doesn't change the requirements of the code. It simply states that the building HVAC system can be utilized. As an example, even in atrium exhaust systems, the normal building mechanical ventilation systems are often designed to provide makeup air for the atrium exhaust system. A separate makeup air system is not mandated by the code and shouldn't be. Fire dampers in supply ducts serving as makeup air in a smoke control mode do not jeopardize the performance of the smoke control system.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Modified

Modify the proposal as follows:

716.2.1 (IMC [B] 607.2.1) Smoke control system. Where the installation of a fire damper will interfere with the operation of a required smoke control system ~~designed~~ in accordance with Section 909, approved alternative protection shall be utilized. Where mechanical systems including ducts and dampers utilized for normal building ventilation serve as part of the smoke control system, the expected performance of these systems in smoke control mode shall be addressed in the rational analysis required by Section 909.4.

Committee Reason: The added language regarding the performance of mechanical systems used for smoke control is appropriate and will aid in plan review and enforcement. The modification deletes what the committee considered a confusing and unnecessary term.

Assembly Action:

None

Final Hearing Results

FS137-07/08

AM

Code Change No: FS139-07/08

Original Proposal

Sections: 716.3, 716.3.1, 716.3.2, 716.3.2.1 (New), Table 716.3.3.1, 716.3.2.2 (New), 716.3.1.1, 716.3.3.1 (New), 716.3.2.1, 716.3.3.3 (New) [IMC [B] 607.3, [B] 607.3.1, [B] Table 607.3.1, [B] 607.3.1.1, [B] 607.3.2, [B] 607.3.2.1

Proponent: Lee J. Kranz, City of Bellevue, representing The Washington Association of Building Officials (WABO), Technical Code Development Committee

Revise as follows:

716.3 (IMC [B] 607.3) Damper testing, and ratings and actuation. Damper testing, ratings and actuation shall be in accordance with Sections 716.3.1 through 716.3.3.

716.3.1 (IMC [B] 607.3.1) Damper testing. Dampers shall be listed and bear the label of an approved testing agency indicating compliance with the standards in this section. Fire dampers shall comply with the requirements of UL 555. Only fire dampers labeled for use in dynamic systems shall be installed in heating, ventilation and air-conditioning systems designed to operate with fans on during a fire. Smoke dampers shall comply with the requirements of UL 555S. Combination fire/smoke dampers shall comply with the requirements of both UL 555 and UL 555S. Ceiling radiation dampers shall comply with the requirements of UL 555C.

~~716.3.1.2~~ **716.3.2 (IMC [B] 607.3.1-607.3.2) Fire protection Damper rating.** Damper ratings shall be in accordance with Sections 716.3.2.1 and 716.3.2.2.

716.3.2.1 (IMC [B] 607.3.2.1) Fire damper ratings. Fire dampers shall have the minimum fire protection rating specified in ~~Table 716.3.4~~ 716.3.2.1 for the type of penetration.

**TABLE ~~716.3.4~~ 716.3.2.1 (IMC [B] Table 607.3.4 607.3.2.1)
FIRE DAMPER RATING**

(Portions of table not shown do not change)

716.3.2.2 (IMC [B] 607.3.2.2) Smoke damper ratings. Smoke damper leakage ratings shall not be less than Class II. Elevated temperature ratings shall not be less than 250°F (121°C).

716.3.1.4 716.3.3 (IMC [B] 607.3.1.4-607.3.3) Fire Damper actuating device actuation. Damper actuation shall be in accordance with 716.3.3.1 through 716.3.3.3 as applicable.

716.3.3.1 (IMC [B] 607.3.3.1) Fire damper actuation device. The fire damper actuating actuation device shall meet one of the following requirements:

1. The operating temperature shall be approximately 50°F (10°C) above the normal temperature within the duct system, but not less than 160°F (71°C).
2. The operating temperature shall be not more than 286°F (141°C) where located in a smoke control system complying with Section 909.
3. ~~Where a combination fire/smoke damper is located in a smoke control system complying with Section 909, the operating temperature rating shall be approximately 50°F (10°C) above the maximum smoke control system designed operating temperature, or a maximum temperature of 350°F (177°C). The temperature shall not exceed the UL 555S degradation test temperature rating for a combination fire/smoke damper.~~

~~**716.3.2 (IMC [B] 607.3.2) Smoke damper ratings.** Smoke damper leakage ratings shall not be less than Class II. Elevated temperature ratings shall not be less than 250°F (121°C).~~

~~**716.3.2.4 716.3.3.2 (IMC [B] 607.3.2.4-607.3.3.2) Smoke damper actuation methods.** The smoke damper shall close upon actuation of a listed smoke detector or detectors installed in accordance with Section 907.10 and one of the following methods, as applicable:~~

1. Where a smoke damper is installed within a duct, a smoke detector shall be installed in the duct within 5 feet (1524 mm) of the damper with no air outlets or inlets between the detector and the damper. The detector shall be listed for the air velocity, temperature and humidity anticipated at the point where it is installed. Other than in mechanical smoke control systems, dampers shall be closed upon fan shutdown where local smoke detectors require a minimum velocity to operate.
2. Where a smoke damper is installed above smoke barrier doors in a smoke barrier, a spot-type detector listed for releasing service shall be installed on either side of the smoke barrier door opening.
3. Where a smoke damper is installed within an unducted opening in a wall, a spot-type detector listed for releasing service shall be installed within 5 feet (1524 mm) horizontally of the damper.
4. Where a smoke damper is installed in a corridor wall or ceiling, the damper shall be permitted to be controlled by a smoke detection system installed in the corridor.
5. Where a total-coverage smoke detector system is provided within areas served by a heating, ventilation and air-conditioning (HVAC) system, smoke dampers shall be permitted to be controlled by the smoke detection system.

716.3.3.3 (IMC [B] 607.3.3.3) Smoke control system damper actuation. Where a combination fire/smoke damper is located in a smoke control system complying with Section 909, the operating temperature rating shall be approximately 50°F (27.8°C) above the maximum smoke control system designed operating temperature, or a maximum temperature of 350°F (177°C). The temperature shall not exceed the UL 555S degradation test temperature rating for a combination fire/smoke damper.

Reason: This is a reorganization of IBC Section 716.3 related to fire damper, smoke damper and combination fire/smoke damper testing, rating and actuation requirements. The proposed format addresses testing, rating and actuation for all 3 types of dampers into 3 separate subsections which organizes the information to be more user friendly. Item #3 of Section 716.3.1.1 has been relocated to a new Section 716.3.3.3 and has a new title that more accurately reflects its purpose.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: Based on the proponent's request for disapproval.

Assembly Action:

None

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Lee J. Kranz, City of Bellevue, Washington, representing Washington Association of Building Officials Technical Code Development Committee, requests Approved as Modified by this public comment.

Modify proposal as follows:

716.3.2 (IMC [B] 607.3.2) Damper rating. Damper ratings shall be in accordance with Sections 716.3.2.1 and ~~716.3.2.2~~ through 716.3.2.3.

716.3.2.3 (IMC [B] 607.3.2.3) Combination fire/smoke damper ratings. Combination fire/smoke dampers shall have the minimum fire protection rating specified for fire dampers in Table 716.3.2.1 for the type of penetration and shall also have a minimum Class II leakage rating and a minimum elevated temperature rating of 250°F (121°C).

716.3.3.1 (IMC [B] 607.3.3.1) Fire damper actuation device. The fire damper actuation device shall meet one of the following requirements:

1. The operating temperature shall be approximately 50°F (10°C) above the normal temperature within the duct system, but not less than 160°F (71°C).
2. The operating temperature shall be not more than ~~350°F (177°C)~~ 286°F (141°C) where located in a smoke control system complying with Section 909.

716.3.3.2 (IMC [B] 607.3.3.2) Smoke damper actuation methods. The smoke damper shall close upon actuation of a listed smoke detector or detectors installed in accordance with Section 907.10 and one of the following methods, as applicable:

1. Where a smoke damper is installed within a duct, a smoke detector shall be installed in the duct within 5 feet (1524 mm) of the damper with no air outlets or inlets between the detector and the damper. The detector shall be listed for the air velocity, temperature and humidity anticipated at the point where it is installed. Other than in mechanical smoke control systems, dampers shall be closed upon fan shutdown where local smoke detectors require a minimum velocity to operate.
2. Where a smoke damper is installed above smoke barrier doors in a smoke barrier, a spot-type detector listed for releasing service shall be installed on either side of the smoke barrier door opening.
3. Where a smoke damper is installed within an unducted opening in a wall, a spot-type detector listed for releasing service shall be installed within 5 feet (1524 mm) horizontally of the damper.
4. Where a smoke damper is installed in a corridor wall or ceiling, the damper shall be permitted to be controlled by a smoke detection system installed in the corridor.
5. Where a total-coverage smoke detector system is provided within areas served by a heating, ventilation and air-conditioning (HVAC) system, smoke dampers shall be permitted to be controlled by the smoke detection system.

~~**716.3.3.3 (IMC [B]607.3.3.3) Smoke control system damper actuation.** Where a combination fire/smoke damper is located in a smoke control system complying with Section 909, the operating temperature rating shall be approximately 50°F (27.8°C) above the maximum smoke control system designed operating temperature, or a maximum temperature of 350°F (177°C). The temperature shall not exceed the UL 555S degradation test temperature rating for a combination fire/smoke damper.~~

716.3.3.3 (IMC [B]607.3.3.3) Combination fire/smoke damper actuation. Combination fire/smoke damper actuation shall be in accordance with Sections 716.3.3.1 and 716.3.3.2. Combination fire/smoke dampers installed in smoke control system shaft penetrations shall not be activated by local area smoke detection unless it is secondary to the smoke management system controls.

716.3.3.4 (IMC [B]607.3.3.4) Ceiling radiation damper actuation. The operating temperature of a ceiling radiation damper actuation device shall be 50°F (27.8°C) above the normal temperature within the duct system, but not less than 160°F (71°C).

716.6.2.1 (IMC [B]607.6.2.1) Ceiling radiation dampers. ~~Ceiling radiation dampers shall be tested in accordance with UL 555C and~~ installed in accordance with the manufacturer’s installation instructions and listing. Ceiling radiation dampers are not required where either of the following applies:

1. Tests in accordance with ASTM E119 have shown that ceiling radiation dampers are not necessary in order to maintain the fire-resistance rating of the assembly.
2. Where exhaust duct penetrations are protected in accordance with Section 712.4.1.2, are located within the cavity of a wall and do not pass through another dwelling unit or tenant space.

(Portions of proposal not shown remain unchanged)

Commenter’s Reason: After meeting with industry representatives we are suggesting approval of this proposal.

This code change accomplishes 5 things:

1. It consolidates all the code requirements for testing, ratings and actuation of dampers into one subsection which makes it more user friendly and accessible.
2. Clarifies that combination fire/smoke dampers must meet the hourly rating requirements of Table 716.3.2.1.
3. Modifies the maximum damper operating temperature for fire dampers used in smoke control systems to 350 degrees F to be consistent with other provisions in IBC Section 716.

4. Clarifies that combination fire/smoke dampers used in smoke control systems shall not be activated by a local area detector as that could render the smoke control system inoperable.
5. Adds ceiling radiation damper actuation criteria.
- This change is needed to provide better clarity and usability. The format is organized better because it gives the requirements for each of the 4 types of dampers; fire, smoke, combination fire/smoke and ceiling radiation dampers, in 3 separate subsections; testing, rating and actuation. For clarity please add the following to the bottom of the reason statement: Stikethroughs and underlines show changes to the current code text.

Final Hearing Results

FS139-07/08

AMPC

Code Change No: FS141-07/08

Original Proposal

Sections: 716.5 (IMC [B] 607.5)

Proponent: Sam Dardano, City of Boulder, representing Colorado Association of Plumbing and Mechanical Officials (CAPMO)

Revise as follows:

716.5 (IMC [B] 607.5) (Supp) Where required. Fire dampers, smoke dampers and combination fire/smoke dampers ~~and ceiling radiation dampers~~ shall be provided at the locations prescribed in Sections 716.5.1 through 716.5.7. Where an assembly is required to have both fire dampers and smoke dampers, combination fire/smoke dampers or a fire damper and a smoke damper shall be required.

Reason: Ceiling dampers do not belong in this section as none of the referenced sections (716.5.1 through 716.5.7) relate to them.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:**Approved as Submitted**

Committee Reason: The committee agreed that ceiling dampers do not belong in this section as none of the referenced sections (716.5.1 through 716.5.7) relate to them.

Assembly Action:**None**

Final Hearing Results

FS141-07/08

AS

Code Change No: **FS145-07/08**

Original Proposal

Sections: 716.5.4 (IMC [B] 607.5.3)

Proponent: Lori Lee Graham, City of Portland, OR

Revise as follows:

716.5.4 (IMC [B] 607.5.3) (Supp) Fire partitions. Ducts and air transfer openings that penetrate fire partitions shall be protected with listed fire dampers installed in accordance with their listing.

Exceptions: In occupancies other than Group H, fire dampers are not required where any of the following apply:

1. ~~The partitions are tenant separation or~~ Corridor walls in buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2 and the duct is protected as a through penetration in accordance with Section 712.

(Exceptions not shown remain unchanged)

Reason: There has been confusion in the interpretation of this exception. In the IBC, the term 'tenant separation' is used only in conjunction with covered mall buildings. Since covered mall buildings are explicitly addressed in 716.5.4, Exception 2, there is a question about what the term 'tenant separation' means in the first exception and as such the first exception has been used in any case where two tenants are next to each other including dwelling units. Deletion of the first portion of exception 1 allows the corridor exception to remain and does not negatively affect covered malls since they are addressed in exception 2

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The committee agreed that since covered mall buildings are explicitly addressed in 716.5.4, Exception 2, there is a question about what the term 'tenant separation' means in the first exception. Deletion of the first portion of exception 1 allows the corridor exception to remain and does not negatively affect covered malls since they are addressed in exception 2.

Assembly Action:

None

Final Hearing Results

FS145-07/08

AS

Code Change No: **FS147-07/08**

Original Proposal

Sections: 717.2.5, 717.2.5.1 (New); IRC R602.8

Proponent: Jesse J. Beitel, Hughes Associates, Inc., representing Spray Polyurethane Foam Alliance

THESE PROPOSALS ARE ON THE AGENDA OF THE IBC FIRE SAFETY AND IRC BUILDING/ENERGY CODE DEVELOPMENT COMMITTEES AS 2 SEPARATE CODE CHANGES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IBC FIRE SAFETY

Delete and substitute as follows:

~~**717.2.5 Ceiling and floor openings.** Where annular space protection is provided in accordance with Exception 6 of Section 707.2, Exception 1 of Section 712.4.1.2, or Section 712.4.2, fireblocking shall be installed at openings around vents, pipes, ducts, chimneys and fireplaces at ceiling and floor levels, with an approved material to resist the free passage of flame and the products of combustion. Factory-built chimneys and fireplaces shall be fireblocked in accordance with UL 103 and UL 127.~~

717.2.5 Ceiling and floor openings. Where required by Exception 6 of Section 707.2, Exception 1 of Section 712.4.1.2 or Section 712.4.2, fireblocking of the annular space around vents, pipes, ducts, chimneys and fireplaces at ceilings and floor levels shall be installed with a material specifically tested in the form and manner intended for use to demonstrate its ability to remain in place and resist the free passage of flame and the products of combustion.

717.2.5.1 Factory-built chimneys and fireplaces. Factory-built chimneys and fireplaces shall be fireblocked in accordance with UL 103 and UL 127.

PART II – IRC BUILDING/ENERGY

Revise as follows:

R602.8 Fireblocking required. Fireblocking shall be provided to cut off all concealed draft openings (both vertical and horizontal) and to form an effective fire barrier between stories, and between a top story and the roof space. Fireblocking shall be provided in wood-frame construction in the following locations.

1. In concealed spaces of stud walls and partitions, including furred spaces and parallel rows of studs or staggered studs; as follows:
 - 1.1. Vertically at the ceiling and floor levels.
 - 1.2. Horizontally at intervals not exceeding 10 feet (3048 mm).
2. At all interconnections between concealed vertical and horizontal spaces such as occur at soffits, drop ceilings and cove ceilings.
3. In concealed spaces between stair stringers at the top and bottom of the run. Enclosed spaces under stairs shall comply with Section R311.2.2.
4. At openings around vents, pipes, ducts, cables and wires at ceiling and floor level, with an approved material to resist the free passage of flame and products of combustion. ~~The material filling this annular space shall not be required to meet the ASTM E 136 requirements~~ a material specifically tested in the form and manner intended for use to demonstrate its ability to remain in place and resist the free passage of flame and the products of combustion.
5. For the fireblocking of chimneys and fireplaces, see Section R1003.19.
6. Fireblocking of cornices of a two-family dwelling is required at the line of dwelling unit separation.

Reason: (IBC) During the last Code change cycle there were discussions concerning fireblocking materials and their use. To address these issues, this code proposal is a revision to the existing Section 717.2.5 of the IBC.

The revision clarifies the requirements for the fireblocking materials. The requirements are that any material used as fireblocking in combustible construction must demonstrate via testing, that it can remain in place and resist the free passage of flame and products of combustion. While a specific test is not specified, some manufacturers have used existing standardized tests to demonstrate that their materials can meet these requirements.

The language for the performance requirements is similar to that already in Section 717.2.5 and in Section 717.2.1 for loose-fill insulation used as fireblocking.

The revision also allows that any material (combustible or noncombustible) can be used if it demonstrates that it can meet the performance requirements. Thus, the words “approved material” were not included in this revision.

This revision provides clearer requirements to assist Code Officials in using this Section.

(IRC) During the last Code change cycle there were discussions concerning fireblocking materials and their use. To address these issues, this code proposal is a revision to the existing Item 4 of Section R602.8 of the IRC.

The revision clarifies the requirements for the fireblocking materials used in this application. The requirements are that any material used as fireblocking must demonstrate via testing, that it can remain in place and resist the free passage of flame and products of combustion. While a specific test is not specified, some manufacturers have used existing standardized tests to demonstrate that their materials can meet these requirements.

The language for the performance requirements is similar to that required in Section R602.8.1.3 [Supplement] of the IRC for loose-fill insulation used as fireblocking.

The revision also allows any material (combustible or noncombustible) to be used if it demonstrates that it can meet the performance requirements. Thus, the additional language added during the last cycle concerning “...not be required to meet the ASTM E 136 requirements” was not included in this revision.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

PART I – IBC FIRE SAFETY

Committee Action:

Approved as Submitted

Committee Reason: The committee agreed that these proposed revisions provide good performance language describing how fireblocking needs to perform, which will allow for many products to determine compliance.

Assembly Action:

None

PART II – IRC B/E

Committee Action:

Disapproved

Committee Reason: This proposal would eliminate fireblocking that is in use now and will require testing. There are no testing criteria specified. This may require proprietary material.

Assembly Action:

None

Final Hearing Results

FS147-07/08, Part I
FS147-07/08, Part II

AS
D

Code Change No: FS149-07/08

Original Proposal

Sections: 202 (New), 719.1, 719.2, 719.2.1, 2604 (New), Chapter 35 (New)

Proponent: Marcelo M. Hirschler, GBH International, representing American Fire Safety Council

1. Add new definition as follows:

REFLECTIVE PLASTIC CORE FOIL INSULATION. An insulation material with a reflective metallic surface on at least one side and a thin plastic core containing voids consisting of open or closed cells distributed throughout the material.

2. Revise as follows:

719.1 General. Insulating materials, including facings such as vapor retarders and vapor-permeable membranes, similar coverings, and all layers of single and multilayer reflective foil insulations, shall comply with the requirements of this section. Where a flame spread index or a smoke-developed index is specified in this section, such index shall

be determined in accordance with ASTM E 84 or UL 723. Any material that is subject to an increase in flame spread index or smoke-developed index beyond the limits herein established through the effects of age, moisture, or other atmospheric conditions shall not be permitted.

Exceptions:

1. Fiberboard insulation shall comply with Chapter 23.
2. Foam plastic insulation shall comply with Chapter 26.
3. Duct and pipe insulation and duct and pipe coverings and linings in plenums shall comply with the *International Mechanical Code*.
4. All layers of single and multilayer reflective plastic core foil insulation shall comply with Section 2604.

719.2 Concealed installation. Insulating materials, where concealed as installed in buildings of any type of construction, shall have a flame spread index of not more than 25 and a smoke-developed index of not more than 450.

Exception: Cellulose loose-fill insulation that is not spray applied, complying with the requirements of Section 719.6, shall only be required to meet the smoke-developed index of not more than 450.

719.2.1 Facings. Where such materials are installed in concealed spaces in buildings of Type III, IV or V construction, the flame spread and smoke-developed limitations do not apply to facings, coverings, and layers of reflective foil insulation that are installed behind and in substantial contact with the unexposed surface of the ceiling, wall or floor finish.

Exception: All layers of single and multilayer reflective plastic core foil insulation shall comply with Section 2604.

3. Add new text as follows

SECTION 2604
REFLECTIVE PLASTIC CORE FOIL INSULATION

2604.1 General. The provisions of this section shall govern the requirements and uses of reflective plastic core foil insulation in buildings and structures. Reflective plastic core insulation shall comply with the requirements of 2604.2 and of one of the following: Section 2604.3, 2604.4 or 2604.5.

2604.2 Labeling and identification. Packages and containers of reflective plastic core foil insulation and reflective plastic core foil insulation components delivered to the job site shall bear the label of an approved agency showing the manufacturer's name, the product listing, product identification and information sufficient to determine that the end use will comply with the code requirements.

2604.3 Surface burning characteristics. Testing in accordance with ASTM E 84 or UL 723 shall be in accordance with Sections 2604.3.1 and 2604.3.2.

2604.3.1 Special preparation and mounting. Reflective plastic core foil insulation shall be tested in the manner intended for use and at the maximum thickness intended for use, in accordance with ASTM E 84, or UL 723, using the specimen preparation and mounting procedures of ASTM E 2231 or an alternate set of specimen preparation and mounting procedures for ASTM E 84, or UL 723, which are specific to the testing of reflective plastic core foil insulation.

2604.3.2 Exposed applications. If the reflective plastic core foil insulation is used exposed it shall be classified for surface burning characteristics in accordance with Section 803.1 and the requirements of this code for the application. The flame spread index shall not exceed 75 for any application.

2604.4 Room corner test heat release. Reflective plastic core foil insulation shall comply with the acceptance criteria of Section 803.1.2.1 when tested in accordance with NFPA 286 in the manner intended for use and at the maximum thickness intended for use.

2604.5 Thermal barrier. Reflective plastic core foil insulation shall be separated from the interior of a building by an approved thermal barrier of 0.5-inch (12.7 mm) gypsum wallboard or equivalent thermal barrier material that will limit the average temperature rise of the unexposed surface to not more than 250°F (120°C) after 15 minutes of fire exposure, complying with the standard time-temperature curve of ASTM E 119 or UL 263.

2604.5.1 Thermal barrier installation. The thermal barrier shall be installed in such a manner that it will remain in place for 15 minutes based on FM 4880, UL 1040, NFPA 286 or UL 1715.

2604.5.2 Surface burning characteristics. The reflective plastic core foil insulation shall exhibit a flame spread index no higher than 75 and a smoke developed index no higher than 450 when tested in accordance with Section 2604.3.1.

(Renumber subsequent sections)

4. Add standard to Chapter 35 as follows:

ASTM

E 2231-07 Standard Practice for Specimen Preparation and Mounting of Pipe and Duct Insulation Materials to Assess Surface Burning Characteristics

Reason: Recent work has shown that the traditional method of testing reflective plastic core foil insulation in the ASTM E 84 test (using chicken wire, or poultry netting, and rods) produces misleading results, with the serious potential for leading to severe fires. Testing reflective plastic core foil insulation with the ASTM E 84 test using chicken wire and rods suggests that the reflective plastic core foil insulation is safe and meets a flame spread index of 25 or less. In fact, when reflective plastic core foil insulation is tested in a more realistic way, with fasteners, the flame spread index of some materials jumps to over 200. A room corner test, NFPA 286, indicates that some types of reflective plastic core insulation do indeed cause rapid flashover (in less than 4 min, while the burner is still just at 40 kW and has not yet been raised to 160 kW). ASTM E 2231 is a standard practice for Steiner tunnel specimen preparation and mounting for pipe and duct insulation materials that does not permit testing using chicken wire (poultry netting) and that can be used for testing reflective plastic core foil insulation materials. Moreover, a process is underway, within the ASTM E05.22 subcommittee, to develop an alternate standard practice specific to reflective plastic core foil insulation materials. It has become apparent that testing via ASTM E 84 with either (a) mounting in accordance with ASTM E 2231 or (b) mounting in accordance with a standard practice specific to plastic core reflective foil insulation materials (yet to be developed) will represent a significant improvement in fire safety.

Alternately, reflective plastic core foil insulation materials can be tested using the room corner test, NFPA 286, or they can be covered with a thermal barrier, just like foam plastic insulation is required to be covered.

The fire safety issues have mainly been found with the foil/bubble materials, but they would also apply to the foil/foam materials, which are already covered under the requirements of foam plastic insulation and don't need additional requirements but should not be excluded from the foam plastic requirements.

This proposal differs from proposal FS147 in the 2006/2007 cycle in several major ways, as follows:

1. This proposal permits continued testing in the Steiner tunnel test (ASTM E 84 or UL 723), but requires the use of an appropriate specimen preparation and mounting method.
2. This proposal excludes reflective foil/fiberglass materials from the new requirements, as these materials are already appropriately tested at present.
3. This proposal includes a definition of reflective plastic core foil insulation, which was absent before.
4. This proposal adds a new section into Chapter 26 that is very similar to the section for foam plastic insulation, which immediately precedes it.
5. The specimen preparation and mounting method proposed, ASTM E 2231, is already used by the ICC family of codes both in the IMC and in the IRC.
6. The new code language proposed is already suitable for incorporating any future standard practice for ASTM E 84 test specimen preparation and mounting of reflective plastic core foil insulation materials, if and when it is developed.
7. The code proposal also addresses section 719.2.1, previously not addressed.

This proposal differs from proposal FS215 in the 2006/2007 cycle in several major ways, as follows:

1. This proposal permits continued testing in the Steiner tunnel test (ASTM E 84 or UL 723), but requires the use of an appropriate specimen preparation and mounting method.
2. This proposal excludes reflective foil/fiberglass materials from the new requirements, as these materials are already appropriately tested at present.
3. The specimen preparation and mounting method proposed, ASTM E 2231, is already used by the ICC family of codes both in the IMC and in the IRC.
4. The new code language proposed is already suitable for incorporating any future standard practice for ASTM E 84 test specimen preparation and mounting of reflective plastic core foil insulation materials, if and when it is developed.
5. This proposal addresses section 719 as well as the new section 2604.
6. This proposal revises the definition as requested by the committee.

Cost Impact: The code change proposal should not increase the cost of construction.

Public Hearing Results

Analysis: Review of proposed new standard ASTM E2231-07 indicated that, in the opinion of ICC Staff, the standard did comply with ICC standards criteria.

Committee Action:

Disapproved

Committee Reason: As with FS148-07/08, the committee felt that the proposed requirements for reflective plastic core foil insulation were not totally appropriate. The referenced standard is applicable to a different component (pipe and duct insulation); therefore its applicability to plastic core foil insulation is not clear. Some of the items seem unnecessary, such as the thermal barrier requirements. Lastly, some of the language in the labeling requirements appears difficult to achieve, such as "information to determine that the end use will comply with the code requirements."

Assembly Action:

None

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Jesse J. Beitel, Hughs Associates, Inc., representing Reflective Insulation Manufacturers Association, requests Approved as Modified by this public comment.

Marcelo M. Hirschler, GBH International, representing American Fire Safety Council, requests Approved as Modified by this public comment.

Replace proposal as follows:

REFLECTIVE PLASTIC CORE INSULATION. An insulation material packaged in rolls, that is less than 0.5 inches thick, with at least one exterior low emittance surface (0.1 or less) and a core material containing voids or cells.

719.1 General. Insulating materials, including facings such as vapor retarders and vapor-permeable membranes, similar coverings, and all layers of single and multilayer reflective foil insulations, shall comply with the requirements of this section. Where a flame spread index or a smoke-developed index is specified in this section, such index shall be determined in accordance with ASTM E 84 or UL 723. Any material that is subject to an increase in flame spread index or smoke-developed index beyond the limits herein established through the effects of age, moisture, or other atmospheric conditions shall not be permitted.

Exceptions:

1. Fiberboard insulation shall comply with Chapter 23.
2. Foam plastic insulation shall comply with Chapter 26.
3. Duct and pipe insulation and duct and pipe coverings and linings in plenums shall comply with the *International Mechanical Code*.
4. All layers of single and multilayer reflective plastic core insulation shall comply with Section 2612.

719.2 Concealed installation. Insulating materials, where concealed as installed in buildings of any type of construction, shall have a flame spread index of not more than 25 and a smoke-developed index of not more than 450.

Exception: Cellulose loose-fill insulation that is not spray applied, complying with the requirements of Section 719.6, shall only be required to meet the smoke-developed index of not more than 450.

719.2.1 Facings. Where such materials are installed in concealed spaces in buildings of Type III, IV or V construction, the flame spread and smoke-developed limitations do not apply to facings, coverings, and layers of reflective foil insulation that are installed behind and in substantial contact with the unexposed surface of the ceiling, wall or floor finish.

Exception: All layers of single and multilayer reflective plastic core insulation shall comply with Section 2612.

SECTION 2612
REFLECTIVE PLASTIC CORE INSULATION

2612.1 General. The provisions of this section shall govern the requirements and uses of reflective plastic core insulation in buildings and structures. Reflective plastic core insulation shall comply with the requirements of Section 2612.2 and of one of the following: Section 2612.3 or 2612.4.

2612.2 Identification. Packages and containers of reflective plastic core insulation delivered to the job site shall show the manufacturer's or supplier's name, product identification and information sufficient to determine that the end use will comply with the code requirements.

2612.3 Surface-burning characteristics. Reflective plastic core insulation shall have a flame-spread index of not more than 25 and a smoke-developed index of not more than 450 when tested in accordance with ASTM E 84 or UL 723. The reflective plastic core insulation shall be tested at the maximum thickness intended for use and shall be tested using one of the mounting methods in Section 2612.3.1 or 2612.3.2.

2612.3.1 Mounting of test specimen. The test specimen shall be mounted on 2-inch (51 mm) high metal frames so as to that create an air space between the unexposed face of the reflective plastic core insulation and the lid of the test apparatus.

2612.3.2 Specific testing. A set of specimen preparation and mounting procedures shall be used which are specific to the testing of reflective plastic core insulation.

2612.4 Room corner test heat release. Reflective plastic core insulation shall comply with the acceptance criteria of Section 803.1.2.1 when tested in accordance with NFPA 286 or UL 1715 in the manner intended for use and at the maximum thickness intended for use.

Commenter's Reason: (Beitel) This comment applies to the following Code proposals: FS148, FS149 and FS195. This comment is an agreement between the proponents of the three referenced Code proposals and other involved industries. This wording was developed at the Code Hearings in Palm Springs and it was proposed as a floor modification. At that time, the FS Committee Chair ruled that the proposed floor modification was out of order due to the perceived extent of the modifications. The Committee basically asked that the proponents of the three Code proposals submit the modification in the Comment process and this Comment addresses that request.

Background

In the last Code cycle, the issue of the fire performance and fire testing of reflective plastic core insulations was raised. The manufacturers of these products were then engaged in a research and testing program to evaluate the fire performance of these products and developed a new mounting method for these types of materials in the ASTM E84 test method such that the E84 flame-spread results could be correlated to full-scale fire tests of the same materials in end-use configurations. This has been accomplished and a new mounting method for these types of materials is currently being processed by ASTM.

FS 195, FS 148 and FS149 were Code proposals submitted to address these issues. The overall purpose was to add a new Section to Chapter 26 that adds a definition of reflective plastic core insulation and provide fire test requirements for these types of materials.

Comment

The proposed Comment is an incorporation of the best points from the three Code Proposals. The primary changes are:

1. Providing pointers in two Sections of the Code (§719.1 & §719.2.1) that send the reader to the appropriate Section in Chapter 26
2. (from FS148 & FS149)
3. Provides an improved definition of the Reflective Plastic Core Insulation material (from FS195, FS148 & FS149 plus other input)
4. Provides a better reference to the tests that are required. These tests use either a new ASTM E84 mounting method (either as a written description or as a new ASTM E84 mounting method in process) or a room/corner test. (from FS148, FS149 & FS195)

The modifications proposed in this Comment, are supported by the proponents of FS148, FS149 and FS195 as well as many other interested parties. These parties believe that this is a very good compromise for all and it should be adopted by the membership so these products can be appropriately regulated in the 2009 edition of the IBC.

Commenter's Reason: (Hirschler) This comment is the result of an agreement between the proponent of FS 148 and FS 149 and the proponent of FS 195. It combines the key elements of both proposals. This same wording was proposed as a floor modification at the Palm Springs code hearings but the committee chair ruled that the modifications to the individual proposals were too significant to be considered.

The key problem to be solved is that "reflective plastic core insulation" is not properly tested when the ASTM E 84 (Steiner tunnel) fire test method is used without the correct mounting procedure, since it has been shown that materials can pass the ASTM E 84 test (when conducted in a way that is inappropriate for reflective plastic core insulation materials) and yet lead to flashover in a room-corner test. Materials that perform in that fashion are not safe. Manufacturers have developed alternate materials that can be used properly.

The testing problem can be solved in two ways: (a) testing in accordance with the room-corner fire test (NFPA 286), which is suitable for use by all interior finish materials or (b) testing in accordance with ASTM E 84 but mounting the material such that it is tested at the maximum thickness intended for use and by using a mounting method that is specific for its use, such as being mounted on 2-inch (51 mm) high metal frames so as to that create an air space between the unexposed face of the reflective plastic core insulation and the lid of the test apparatus.

There are some differences between this comment and the original FS 149 proposal:

A more generic definition is being proposed here (not only foil needs to be used).

There is an understanding here that foam plastic core reflective insulation is a foam plastic and needs to meet the requirements of exposed foam plastics, so that this need not be repeated.

There is an understanding here that insulation materials intended for use as pipe and duct insulation (and tested in accordance with ASTM E 84 and the mounting method of ASTM E 2231) are properly covered by the International Mechanical Code, so that this need not be repeated.

There is no requirement for listing in this proposal.

There are some differences between this comment and the original FS 195 proposal:

A more generic definition is being proposed here (less restrictive).

The reflective insulation referenced in sections 719.1 and 719.2 are also addressed.

There is no reference to a potential future ASTM standard mounting method.

This comment has received approval from the two industries that made the original proposals, namely the manufacturers of fire retardants (American Fire Safety Council, submitters of FS 148 and FS 149) and the manufacturers of reflective plastic core insulation (Reflective Insulation Manufacturers Association, submitters of FS 195). The proposed code wording in this comment was distributed through a variety of other stake holders, many of whom were lined up in February at Palm Springs in support of the proposal.

Final Hearing Results

FS149-07/08

AMPC

Code Change No: **FS153-07/08**

Original Proposal

Table 720.1(3)

Proponent: Philip Brazil, PE, Reid Middleton, Inc., representing himself

Revise table as follows:

**TABLE 720.1(3)
MINIMUM PROTECTION FOR FLOOR AND ROOF SYSTEMS^{a,q}**

FLOOR OR ROOF CONSTRUCTION	ITEM NUMBER	CEILING CONSTRUCTION	MINIMUM THICKNESS OF CEILING (inches)	
			2 hour	1 hour
23. Wood I-joint (minimum joist depth 9-1/4" with a minimum flange depth of 15/16" and a minimum flange cross sectional area of 2.3 square inches) at 24" o.c. spacing with 1x4 (nominal) wood furring strip spacer applied parallel to and covering the bottom of the bottom flange of each member, tacked in place. 2" mineral wool insulation, 3.5 pcf (nominal) installed adjacent to the bottom flange of the I-joint and supported by the 1x4 furring strip spacer.	23-1.1	1/2" deep single leg resilient channel 16" on center (channels doubled at wallboard end joints), placed perpendicular to the furring strip and joist and attached to each joist by 1-7/8" Type S drywall screws. 5/8" Type C gypsum wallboard applied perpendicular to the channel with end joints staggered at least 4' and fastened with 1-1/8" Type S drywall screws spaced 7" on center. Wallboard joints to be taped and covered with joint compound		<u>5/8</u>
25. Wood I-joint (minimum I-joint depth 9-1/4" with a minimum flange depth of 1-1/2" and a minimum flange cross-sectional area of 5.25 square inches; minimum web thickness of 3/8") @ 24" o.c., 1-1/2" mineral fiber wool insulation (2.5 pcf - nominal) resting on hat-shaped furring channels.	25-1.1	Minimum 0.026" thick hat-shaped channel 16" o.c. (channels doubled at wallboard end joints), placed perpendicular to the joist and attached to each joist by 1-5/8" Type S drywall screws. 5/8" Type C gypsum wallboard applied perpendicular to the channel with end joints staggered and fastened with 1-1/8" Type S drywall screws spaced 12" o.c. in the field and 8" o.c. at the wallboard ends. Wallboard joints to be taped and covered with joint compound.		Varies <u>5/8</u>
26. Wood I-joint (minimum I-joint depth 9-1/4" with a minimum flange depth of 1-1/2" and a minimum flange cross-sectional area of 5.25 square inches; minimum web thickness of 7/16") @ 24" o.c., 1-1/2" mineral fiber wool insulation (2.5 pcf - nominal) resting on resilient channels.	26-1.1	Minimum 0.019" thick resilient channel 16" o.c. (channels doubled at wallboard end joints), placed perpendicular to the joist and attached to each joist by 1-5/8" Type S drywall screws. 5/8" Type C gypsum wallboard applied perpendicular to the channel with end joints staggered and fastened with 1" Type S drywall screws spaced 12" o.c. in the field and 8" o.c. at the wallboard ends. Wallboard joints to be taped and covered with joint compound.		Varies <u>5/8</u>
27. Wood I-joint (minimum I-joint depth 9-1/4" with a minimum flange thickness of 1-1/2" and a minimum flange cross-sectional	27-1.1	Two layers of 1/2" Type X gypsum wallboard applied with the long dimension perpendicular to the I-joists with end joints staggered. The base layer		Varies <u>1</u>

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FLOOR OR ROOF CONSTRUCTION	ITEM NUMBER	CEILING CONSTRUCTION	MINIMUM THICKNESS OF CEILING (inches)	
<p>area of 2.25 square inches; minimum web thickness of 3/8") @ 24" o.c.</p>		<p>is fastened with 1-5/8" Type S drywall screws spaced 12" o.c. and the face layer is fastened with 2" Type S drywall screws spaced 12" o.c. in the field and 8" o.c. on the edges. Face layer end joints shall not occur on the same I-joist as base layer end joints and edge joints shall be offset 24" from base layer joints. Face layer to also be attached to base layer with 1-1/2" Type G drywall screws spaced 8" o.c. placed 6" from face layer end joints. Face layer wallboard joints to be taped and covered with joint compound.</p>		
<p>28. Wood I-joist (minimum I-joist depth 9-1/2" with a minimum flange depth of 1-5/16" and a minimum flange cross-sectional area of 1.95 square inches; minimum web thickness of 3/8") @ 24" o.c.</p>	<p>28-1.1</p>	<p>Minimum 0.019" thick resilient channel 16" o.c.(channels doubled at wallboard end joints), placed perpendicular to the joist and attached to each joist by 1-5/8" Type S drywall screws. Two layers of 1/2" Type X gypsum wallboard applied with the long dimension perpendicular to the I-joists with end joints staggered. The base layer is fastened with 1-1/4" Type S drywall screws spaced 12" o.c. and the face layer is fastened with 1-5/8" Type S drywall screws spaced 12" o.c. Face layer end joints shall not occur on the same I-joist as base layer end joints and edge joints shall be offset 24" from base layer joints. Face layer to also be attached to base layer with 1-1/2" Type G drywall screws spaced 8" o.c. placed 6" from face layer end joints. Face layer wallboard joints to be taped and covered with joint compound.</p>		<p>Varies 1</p>
<p>29. Wood I-joist (minimum I-joist depth 9-1/4" with a minimum flange depth of 1-1/2" and a minimum flange cross-sectional area of 2.25 square inches; minimum web thickness of 3/8") @ 24" o.c. with hat-shaped channels supporting the middle and face layers of gypsum wallboard. Unfaced fiberglass insulation is installed between the I-joists supported on the upper surface of the flange by stay wires spaced 12" o.c.</p>	<p>29-1.1</p>	<p>Base layer of 5/8" Type C gypsum wallboard attached directly to I-joists with 1-5/8" Type S drywall screws spaced 12" o.c. with ends staggered. Minimum 0.0179" thick resilient hat-shaped 7/8-inch furring channel 16" o.c. (channels doubled at wallboard end joints), placed perpendicular to the joist and attached to each joist by 1-5/8" Type S drywall screws after the base layer of gypsum wall board has been applied. The middle and face layers of 5/8" Type C gypsum wallboard applied perpendicular to the channel with end joints staggered. The middle layer is fastened with 1" Type S drywall screws spaced 12" o.c. The face layer is applied parallel to the middle layer but with the edge joints offset 24" from those of the middle layer and fastened with 1-5/8" Type S drywall screws 8" o.c. The joints shall be taped and covered with joint compound.</p>	<p>2-3/4</p>	<p>Varies</p>
<p>30. Channel-shaped 18 gauge steel joists (minimum depth 8") spaced a maximum 24" o.c.</p>	<p>30-1.1</p>	<p>Base layer 5/8" Type X gypsum board applied perpendicular to bottom of framing members with 1-1/8" Type S-12</p>	<p>3-3/8</p>	

FLOOR OR ROOF CONSTRUCTION	ITEM NUMBER	CEILING CONSTRUCTION	MINIMUM THICKNESS OF CEILING (inches)	
supporting tongue-and-groove wood structural panels (nominal minimum 3/4" thick) applied perpendicular to framing members. Structural panels attached with 1-5/8" Type S-12 screws spaced 12" o.c.		screws spaced 12" o.c. Second layer 5/8" Type X gypsum board attached perpendicular to framing members with 1-5/8" Type S-12 screws spaced 12" o.c. Second layer joints offset 24" from base layer. Third layer 5/8" Type X gypsum board attached perpendicular to framing members with 2-3/8" Type S-12 screws spaced 12" o.c. Third layer joints offset 12" from second layer joints. Hat-shaped 7/8-inch rigid furring channels applied at right angles to framing members over third layer with two 2-3/8" Type S-12 screws at each framing member. Face layer 5/8" Type X gypsum board applied at right angles to furring channels with 1-1/8" Type S screws spaced 12" o.c.		

(Portions of table not shown remain unchanged)

Reason: The changes are proposed to make technical improvements to the assemblies in Table 720.1(3) and to also make them more consistent with the data in Proposal FS148-04/05-AS, which is the origin of the assemblies.

"Mineral fiber" is changed to "mineral wool" in the column for floor or roof construction at Assemblies 25-1.1 and 26-1.1 because corresponding Diagrams #25 and #26 from FS148-04/05 specify mineral wool. Refer to Item #3 in each of the diagrams.

"Resilient channel" is changed to "hat-shaped 7/8-inch furring channel" in the column for ceiling construction at Assembly 29-1.1 because corresponding Diagram #29 from FS148-04/05 specifies hat-shaped furring channel. Refer to Item #5 of the diagram. The columns for minimum ceiling thickness are also changed from 1-hour to 2-hour assemblies because Diagram #29 specifies a 2-hour, not a 1-hour, fire-resistance rating.

"Varies" is changed to actual thickness in the columns for minimum ceiling thickness because the ceiling thicknesses do not vary in these cases. For Assemblies 23-1.1 and 25-1.1 through 28-1.1, the thickness equals the thickness of gypsum board. For Assembly, 29-1.1, the thickness equals the thickness of the furring channel plus the gypsum board (3 x 5/8 + 7/8).

The language on hat-shaped channels is deleted from the column for floor or roof construction at Assembly 29-1.1 because the channels are between the layers of gypsum board at the ceiling and are not part of the floor or roof construction.

A height of 7/8-inch is added in the column for floor or roof construction at Assembly 30-1.1 because the ceiling thickness of 3-3/8 inch specified in the current 2006 IBC matches the thickness of the gypsum board plus 7/8-inch channels (4 x 5/8 + 7/8).

"Furring" is added to the column for floor or roof construction at Assembly 25-1.1 because corresponding Diagram #25 from FS148-04/05 specifies hat-shaped furring channels. Refer to Item #5 of the diagram.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The committee agreed that the changes in ceiling thickness and terminologies within Table 720.1(3) were appropriate based on industry practices.

Assembly Action:

None

Final Hearing Results

FS153-07/08

AS

Code Change No: FS154-07/08

Original Proposal

Sections: 721.2.4.1, 721.4.1.1 (New), 721.2.4.1.2 (New), 721.2.4.2, 721.2.4.3 (New), 721.2.4.5

Proponent: Joseph J. Messersmith, Jr, PE, Portland Cement Association; Daniel Falconer, PE, American Concrete Institute

Revise as follows:

721.2.4 Concrete columns. Concrete columns shall comply with this section.

721.2.4.1 Minimum size. The minimum overall dimensions of reinforced concrete columns for fire-resistance ratings of 1 hour to 4 for exposure to fire on all sides hours shall comply with ~~Table 721.2.4~~ this section.

721.2.4.1.1 Concrete strength less than or equal to 12,000 psi. For columns made with concrete having a specified compressive strength, f'_c , of less than or equal to 12,000 psi (82.7 MPa), the minimum dimension shall comply with Table 721.2.4.

721.2.4.1.2 Concrete strength greater than 12,000 psi. For columns made with concrete having a specified compressive strength, f'_c , greater than 12,000 psi (82.7 MPa), for fire-resistance ratings of 1 hour to 4 hours the minimum dimension shall be 24 inches (610 mm).

721.2.4.2 Minimum cover for R/C columns. The minimum thickness of concrete cover to the main longitudinal reinforcement in columns, regardless of the type of aggregate used in the concrete and the specified compressive strength of concrete, f'_c , shall not be less than 1 inch (25 mm) times the number of hours of required fire resistance or 2 inches (51 mm), whichever is less.

721.2.4.3 Tie and spiral reinforcement. For concrete columns made with concrete having a specified compressive strength, f'_c , greater than 12,000 psi (82.7 MPa), tie and spiral reinforcement shall comply with the following:

1. The free ends of rectangular ties shall terminate with a 135-degree standard tie hook.
2. The free ends of circular ties shall terminate with a 90-degree standard tie hook.
3. The free ends of spirals, including at lap splices, shall terminate with a 90-degree standard tie hook.

The hook extension at the free end of ties and spirals shall be the larger of six bar diameters and the extension required by Section 7.1.3 of ACI 318. Hooks shall project into the core of the column.

(Renumber subsequent sections)

Reason: The proposal updates the column requirements based on new provisions in ACI 216.1-07/TMS 0216.1-07, *Code Requirements for Determining Fire Resistance of Concrete and Masonry Construction Assemblies*, the successor to ACI 216.1-97/TMS 0216.1-97, which is presently referenced in Section 721.1 of the IBC. Coordinating provisions within the IBC and those of reference standards, on which the IBC's provisions are based, is desirable to avoid confusion among the various users. The intent of the new provisions is to prevent ties or spirals from disengaging from the longitudinal reinforcement should the concrete cover over the ties or spirals be lost during a fire. The proposal expands on the provisions found in ACI 216.1/TMS 0216.1 by addressing spiral reinforcement, which is typically used for lateral reinforcement in round columns.

A separate proposal updates the reference to the new edition of the standard.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The committee agreed that the proposal updates the column requirements based on new provisions in ACI 216.1-07/TMS 0216.1-07, *Code Requirements for Determining Fire Resistance of Concrete and Masonry Construction Assemblies*, which is presently referenced in Section 721.1 of the IBC.

Assembly Action:

None

Final Hearing Results

FS154-07/08

AS

Code Change No: **FS155-07/08**

Original Proposal

Sections: 602.4.7, 721.2, 721.3

Proponent: Sarah A. Rice, Schirmer Engineering Corporation

Revise as follows:

602.4.7 Exterior structural members. Where a ~~horizontal~~ fire separation distance of 20 feet (6096 mm) or more is provided, wood columns and arches conforming to heavy timber sizes shall be permitted to be used externally.

721.2.1.4.3 Nonsymmetrical assemblies. For a wall having no finish on one side or different types or thicknesses of finish on each side, the calculation procedures of Sections 721.2.1.4.1 and 721.2.1.4.2 shall be performed twice, assuming either side of the wall to be the fire-exposed side. The fire-resistance rating of the wall shall not exceed the lower of the two values.

Exception: For an exterior wall with ~~more~~ a fire separation distance greater than 5 feet (1524 mm) of horizontal separation, the fire shall be assumed to occur on the interior side only.

721.3.2.3 Nonsymmetrical assemblies. For a wall having no finish on one side or having different types or thicknesses of finish on each side, the calculation procedures of this section shall be performed twice, assuming either side of the wall to be the fire-exposed side. The fire-resistance rating of the wall shall not exceed the lower of the two values calculated.

Exception: For exterior walls with ~~more~~ a fire separation distance greater than 5 feet (1524 mm) of horizontal separation, the fire shall be assumed to occur on the interior side only.

721.4.1.4 Nonsymmetrical assemblies. For a wall having no finish on one side or having different types or thicknesses of finish on each side, the calculation procedures of this section shall be performed twice, assuming either side to be the fire-exposed side of the wall. The fire resistance of the wall shall not exceed the lower of the two values determined.

Exception: For exterior walls with ~~more~~ a fire separation distance greater than 5 feet (1524 mm) of horizontal separation, the fire shall be assumed to occur on the interior side only.

721.6.2.3 Exterior walls. For an exterior wall ~~having more~~ with a fire separation distance greater than 5 feet (1524 mm) of horizontal separation, the wall is assigned a rating dependent on the interior membrane and the framing as described in Tables 721.6.2(1) and 721.6.2(2). The membrane on the outside of the nonfire-exposed side of exterior walls ~~having more~~ with a fire separation distance greater than 5 feet (1524 mm) of horizontal separation may consist of sheathing, sheathing paper, and siding as described in Table 721.6.2(3).

Reason: The term 'fire separation distance' is defined in 702. The term is most clearly used in Table 602 to determine fire resistance rating of exterior walls based on distance to property lines. It is used in over 40 other places in the code to describe that horizontal distance. These 5 sections currently use the term horizontal separation when the intent of the sections is fire separation distance. The use of the phrase Horizontal separation in these sections is incorrect and could be confused by users as meaning something other than the fire separation distance. The intent of the change is to promote editorial consistency.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The committee agreed that the use of the phrase "horizontal separation" in these sections is incorrect and could be confused by users as meaning something other than the fire separation distance; therefore replacing these terms with "fire separation distance" is appropriate.

Assembly Action:

None

Final Hearing Results

FS155-07/08

AS

Code Change No: FS156-07/08

Original Proposal

Table 721.1.4(1)

Proponent: Joseph J. Messersmith, Jr., PE, Portland Cement Association; Daniel Falconer, PE, American Concrete Institute

Revise table as follows:

**TABLE 721.2.1.4(1)
MULTIPLYING FACTOR FOR FINISHES ON NONFIRE-EXPOSED SIDE OF
CONCRETE OR CONCRETE MASONRY WALLS**

TYPE OF FINISH APPLIED TO CONCRETE OR CONCRETE MASONRY WALL	TYPE OF AGGREGATE USED IN CONCRETE OR CONCRETE MASONRY			
	Concrete: siliceous or carbonate Concrete Masonry: siliceous or calcareous gravel	Concrete: sand lightweight concrete Concrete Masonry: limestone, cinders or unexpected slag	Concrete: lightweight concrete Concrete Masonry: expanded shale, clay or slate	Concrete Masonry: pumice, or expanded slag
Portland cement-sand plaster	1.00	0.75 ^a	0.75 ^a	0.50 ^a
Gypsum-sand plaster or gypsum wallboard	1.25	1.00	1.00	1.00
Gypsum-vermiculite or perlite plaster	1.75	1.50	1.50	1.25
Gypsum wallboard	<u>3.00</u>	<u>2.25</u>	<u>2.25</u>	<u>2.25</u>

For SI: 1 inch = 25.4 mm.

- a. For portland cement-sand plaster 5/8 inch or less in thickness and applied directly to the concrete or concrete masonry on the nonfire-exposed side of the wall, the multiplying factor shall be 1.00.

Reason: The proposal updates the multiplying factor for gypsum wallboard based on values in ACI 216-97/TMS 0216-97, *Standard Method for Determining Fire Resistance of Concrete and Masonry Construction Assemblies*, which is referenced in Section 721.1 of the IBC, and the successor to that standard, ACI 216.1-07/TMS 0216.1-07, *Code Requirements for Determining Fire Resistance of Concrete and Masonry Construction Assemblies*. The same multiplying factors for gypsum wallboard also appear in ASCE 29-05, *Standard Calculation Methods for Structural Fire Protection*, which is also referenced in Section 721.1 of the IBC. Coordinating provisions within the IBC and those of reference standards covering the same subject is desirable to avoid confusion among the various users.

Other changes are editorial to make it clear that the factors are applicable to finishes applied to concrete and concrete masonry walls, provide internal coordination within the table and to make it easier to differentiate between aggregates used in concrete and those used in concrete masonry units.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Modified

Modify the proposal as follows:

TABLE 721.2.1.4(1)
MULTIPLYING FACTOR FOR FINISHES ON NONFIRE-EXPOSED SIDE OF
CONCRETE OR CONCRETE MASONRY WALLS

TYPE OF FINISH APPLIED TO CONCRETE OR CONCRETE MASONRY WALL	TYPE OF AGGREGATE USED IN CONCRETE OR CONCRETE MASONRY			
	Concrete: siliceous or carbonate Concrete Masonry: siliceous or calcareous gravel	Concrete: sand lightweight concrete Concrete Masonry: limestone, cinders or unexpected slag	Concrete: lightweight concrete Concrete Masonry: expanded shale, clay or slate	Concrete Masonry: pumice, or expanded slag
Portland cement-sand plaster	1.00	0.75 ^a	0.75 ^a	0.50 ^a
Gypsum-sand plaster	1.25	1.00	1.00	1.00
Gypsum-vermiculite or perlite plaster	1.75	1.50	1.50 1.25	1.25
Gypsum wallboard	3.00	2.25	2.25	2.25

For SI: 1 inch = 25.4 mm.

- a. For portland cement-sand plaster 5/8 inch or less in thickness and applied directly to the concrete or concrete_masonry on the nonfire-exposed side of the wall, the multiplying factor shall be 1.00.

Committee Reason: The committee agreed that the proposal appropriately updates the multiplying factor for gypsum wallboard based on values in ACI 216-97/TMS 0216-97, *Standard Method for Determining Fire Resistance of Concrete and Masonry Construction Assemblies*, which is referenced in Section 721.1 of the IBC. The modification revised the multiplying factor for lightweight concrete with a gypsum-vermiculite or perlite plaster finish from 1.5 to 1.25 for consistency with ACI 216-97/TMS 0216-97.

Assembly Action:

None

Final Hearing Results

FS156-07/08

AM

Code Change No: **FS157-07/08**

Original Proposal

Table 721.2.1.4(1)

Proponent: James C. Gerren, Clark County Department of Development Services, NV

Revise table as follows:

TABLE 721.2.1.4(1)
MULTIPLYING FACTOR FOR FINISHES ON NONFIRE-EXPOSED SIDE OF WALL

TYPE OF FINISH APPLIED TO MASONRY WALL	TYPE OF AGGREGATE USED IN CONCRETE OR CONCRETE MASONRY			
	Concrete: siliceous or carbonate Masonry: siliceous or carbonate; calcareous gravel solid clay brick	Concrete: sand-lightweight concrete Masonry: limestone, cinders or unexpanded slag, clay tile; hollow clay brick; concrete masonry units of expanded shale and <20% sand	Concrete: lightweight concrete Masonry: concrete masonry units of expanded shale, expanded clay, expanded slag, or slate pumice < 20% sand	Concrete: pumice, or expanded slag Masonry: concrete masonry units of expanded slag, expanded clay, or pumice
Portland cement-sand plaster	1.00	0.75 ^a	0.75 ^a	0.50 ^a
Gypsum-sand plaster or gypsum wallboard	1.25	1.00	1.00	1.00
Gypsum-vermiculite or perlite plaster	1.75	1.50	1.50 1.25	1.25
Gypsum wallboard	3.00	2.25	2.25	2.25

For SI: 1 inch = 25.4 mm

- a. For Portland cement-sand plaster 5/8 inch or less in thickness and applied directly to the concrete or masonry on the non-fire-exposed side of the wall, the multiplying factor shall be 1.00.

CODE CHANGES RESOURCE COLLECTION – INTERNATIONAL BUILDING CODE

Reason: The purpose of this proposal is to revise IBC Table 721.2.1.4(1) to be consistent with Table 5.1 of ACI 216.1-97, *Standard Method for Determining Fire Resistance of Concrete and Masonry Construction Assemblies*, and Tables 2-2 and 4-2 of ASCE/SFPE 29-2005, *Standard Calculation Methods for Structural Fire Protection*.

Currently, IBC Sections 721.2.1.4.1 and 721.3.2.1 reference Table 721.2.1.4(1) for the multiplying factors for finishes on the non-fire-exposed side of concrete or concrete masonry walls, respectively. The factors in Table 721.2.1.4(1) are used as part of a calculation method to determine the fire-resistance rating of concrete or concrete masonry walls with finishes of gypsum wallboard or plaster applied to one or both sides of the wall. However, the version of Table 721.2.1.4(1) currently provided in the IBC contains several errors, including:

1. The multiplying factors for gypsum wallboard finishes are lumped together with the factors listed for gypsum-sand plaster. This is a mistake in Table 721.2.1.4(1) that has no technical justification. Table 5.1 of ACI 216.1-97 and Tables 2-2 and 4-2 of ASCE/SFPE 29-2005 all identify separate multiplying factors for gypsum wallboard. The proposed revision to Table 721.2.1.4(1) would correct this mistake and make the multiplying factors for gypsum wallboard in Table 721.2.1.4(1) consistent with Table 5.1 of ACI 216.1-97 and Tables 2-2 and 4-2 of ASCE/SFPE 29-2005.
2. The multiplying factor indicated in Table 721.2.1.4(1) for gypsum-vermiculite or perlite plaster finish applied to lightweight concrete or concrete masonry units of expanded shale, expanded clay, or pumice less than 20% sand is liberally incorrect. Specifically, the multiplying factor is currently provided as 1.50, but should be 1.25, as it is in Table 5.1 of ACI 216.1-97 and Tables 2-2 and 4-2 of ASCE/SFPE 29-2005. Please note that without this correction, the factors in columns 3 and 4 of Table 721.2.1.4(1) are identical and could be merged. However, the separate columns are needed because they are supposed to have different multiplying factors for gypsum-vermiculite or perlite plaster finishes.
3. Column 5 of the current version of Table 721.2.1.4(1) incorrectly references concrete only (i.e., does not reference masonry). However, the intent of the factors in column 5 is to apply to masonry only, not concrete. Specifically, the factors in column 5 are intended to apply to concrete masonry units of expanded slag, expanded clay, or pumice. Please note that the factors provided in column 5 of IBC Table 721.2.1.4(1) are not even used in Table 5.1 of ACI 216.1-97. Instead, these factors are provided in Table 4-2 (masonry), but not Table 2-2 (concrete), of ASCE/SFPE 29-2005. The proposed revision would make IBC Table 721.2.1.4(1) consistent with Table 4-2 of ASCE/SFPE 29-2005.
4. The current column headings in IBC Table 721.2.1.4(1) are vague and inconsistent with Table 5.1 of ACI 216.1-97 and Tables 2-2 and 4-2 of ASCE/SFPE 29-2005. The proposed revisions to the column headings would eliminate potential interpretive issues and make Table 721.2.1.4(1) consistent with Table 5.1 of ACI 216.1-97 and Tables 2-2 and 4-2 of ASCE/SFPE 29-2005.

Since IBC Section 721.1 permits the calculated fire resistance of concrete, concrete masonry, and clay masonry assemblies to be in accordance with ACI 216.1-97, it is necessary to revise IBC Table 721.2.1.4(1) to make it consistent with Table 5.1 of ACI 216.1-97. In addition, the proposed revisions would make IBC Table 721.2.1.4(1) consistent with Tables 2-2 and 4-2 of ASCE/SFPE 29-2005, which is an industry standard regarding calculation methods for structural fire protection.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Modified

**TABLE 721.2.1.4(1)
MULTIPLYING FACTOR FOR FINISHES ON NONFIRE-EXPOSED SIDE OF WALL**

TYPE OF FINISH APPLIED TO WALL	TYPE OF AGGREGATE USED IN CONCRETE OR CONCRETE MASONRY			
	Concrete: siliceous or carbonate Masonry: siliceous or carbonate; solid clay brick	Concrete: sand-lightweight Masonry: clay tile; hollow clay brick; concrete masonry units of expanded shale and <20% sand	Concrete: lightweight Masonry: concrete masonry units of expanded shale, expanded clay, expanded slag, or pumice < 20% sand	Masonry: concrete masonry units of expanded slag, expanded clay, or pumice
Portland cement-sand plaster	1.00	0.75 ^a	0.75 ^a	0.50 ^a
Gypsum-sand plaster	1.25	1.00	1.00	1.00
Gypsum-vermiculite or perlite plaster	1.75	1.50	1.25	1.25
Gypsum wallboard	3.00	2.25	2.25	2.25

For SI: 1 inch = 25.4 mm

- a. For Portland cement-sand plaster 5/8 inch or less in thickness and applied directly to the concrete or concrete masonry on the non-fire-exposed side of the wall, the multiplying factor shall be 1.00.

Committee Reason: The committee agreed that the proposal appropriately updates the multiplying factor for gypsum wallboard based on values in ACI 216-97/TMS 0216-97, *Standard Method for Determining Fire Resistance of Concrete and Masonry Construction Assemblies*, which is referenced in Section 721.1 of the IBC, and Tables 2-2 and 4-2 of ASCE/SFPE 29-2005, *Standard Calculation Methods for Structural Fire Protection*. The modification adds clarification to the footnote that it is concrete masonry that is the specified material.

Assembly Action:

None

Final Hearing Results

FS157-07/08

AM

Code Change No: **FS158-07/08**

Original Proposal

Section: 721.3.1.1, Table 721.3.2

Proponent: Jason Thompson, PE, National Concrete Masonry Association (NCMA), representing Masonry Alliance for Codes and Standards (MACS)

Revise as follows:

721.3.1.1 Concrete masonry unit plus finishes. The equivalent thickness of concrete masonry assemblies, T_{ea} , shall be computed as the sum of the equivalent thickness of the concrete masonry unit, T_e , as determined by Section 721.3.1.2, 721.3.1.3, or 721.3.1.4, plus the equivalent thickness of finishes, T_{ef} , determined in accordance with Section 721.3.2:

$$T_{ea} = T_e + T_{ef} \quad \text{(Equation 7-6)}$$
~~$$T_e = V_n / LH = \text{Equivalent thickness of concrete masonry unit (inch) (mm).}$$~~

where:

~~V_n = Net volume of masonry unit (inch³) (mm³);
 L = Specified length of masonry unit (inch) (mm);
 H = Specified height of masonry unit (inch) (mm).~~

TABLE 721.3.2
MINIMUM EQUIVALENT THICKNESS (inches)
OF BEARING OR NONBEARING CONCRETE MASONRY WALLS^{a,b,c,d}

(Portions of table not shown remain unchanged)

For SI: 1 inch = 25.4 mm.

- a. Values between those shown in the table can be determined by direct interpolation.
- b. Where combustible members are framed into the wall, the thickness of solid material between the end of each member and the opposite face of the wall, or between members set in from opposite sides, shall not be less than 93 percent of the thickness shown in the table.
- c. Requirements of ASTM C 55, ASTM C 73, ~~or~~ ASTM C 90, or ASTM C 744 shall apply.
- d. Minimum required equivalent thickness corresponding to the hourly fire-resistance rating for units with a combination of aggregate shall be determined by linear interpolation based on the percent by volume of each aggregate used in manufacture.

Reason: Section 721.3.1.2 requires that the equivalent thickness of a concrete masonry unit be determined in accordance with ASTM C 140. This is consistent with the method of determining the equivalent thickness in accordance with the reference standard ACI 216.1/TMS 0216, upon which these provisions are based. Section 721.3.1.1, however, also includes an alternative method of calculating the equivalent thickness of a concrete masonry unit that may result in a value different than that determined through standardized procedures. This change proposal removes the alternative method of calculating the equivalent thickness for consistency and clarity.

Footnote c in Table 721.3.2 is modified to introduce concrete masonry units complying with the requirements of ASTM C 744, consistent with the reference standard ACI 216.1/TMS 0216. The physical properties of ASTM C 744 concrete masonry units must comply with either ASTM C 55, C 73, or C 90, depending upon the unit configuration and application.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The committee agreed that this change appropriately removes the alternative method of calculating the equivalent thickness provided in Section 721.3.1.1 that may result in a value different than that determined through standardized procedures. Further, footnote c in

CODE CHANGES RESOURCE COLLECTION – INTERNATIONAL BUILDING CODE

Table 721.3.2 has been appropriately modified to introduce concrete masonry units complying with the requirements of ASTM C 744, consistent with the reference standard ACI 216.1/TMS 0216.

Assembly Action:

None

Final Hearing Results

FS158-07/08

AS

Code Change No: FS159-07/08

Original Proposal

Table 721.6.2(3)

Proponent: Matthew Dobson, Vinyl Siding Institute

Revise table as follows:

**TABLE 721.6.2(3)
MEMBRANE^a ON EXTERIOR FACE OF WOOD STUD WALLS**

SHEATHING	PAPER	EXTERIOR FINISH
5/8-inch T & G lumber 5/16-inch exterior glue wood structural panel ½-inch gypsum wallboard 5/8-inch gypsum wallboard ½-inch fiberboard	Sheathing paper	Lumber siding Wood shingles and shakes ¼-inch wood structural panels—exterior type ¼-inch hardboard Metal siding Stucco on metal lath Masonry veneer Vinyl Siding
None	—	3/8-inch exterior-grade wood structural panels

For SI: 1 pound/cubic foot = 16.0185 kg/m³.

a. Any combination of sheathing, paper and exterior finish is permitted.

Reason: Vinyl siding has no negative impact on the performance ability of a fire rated assemblies. This section of the code simply provides a method of specify a fire rated assembly through the use of certain product that have been given certain performance a ability. The exterior finish component to these assemblies under this section does not provide any additional performance. This will enable the building official to understand that vinyl siding can be applied with these assemblies without any effect to the fire rating.

Vinyl siding is accepted in numerous fire rated assemblies and is well recognized for not contributing to the growth of a fire or creating any undue hazard.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The committee agreed that based on the exterior finishes already allowed in Table 721.6.2(3), the addition of vinyl siding would be appropriate.

Assembly Action:

None

Final Hearing Results

FS159-07/08

AS

Code Change No: FS160-07/08

Original Proposal

Chapter 7; IFC Chapter 7

Proponent: Bill McHugh, Firestop Contractors International Association

THESE PROPOSALS ARE ON THE AGENDA OF THE IBC FIRE SAFETY AND THE IFC CODE DEVELOPMENT COMMITTEES AS 2 SEPARATE CODE CHANGES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES

PART I – IBC FIRE SAFETY

Revise chapter title as follows:

CHAPTER 7
FIRE-RESISTANCE-RATED CONSTRUCTION
FIRE AND SMOKE PROTECTION FEATURES

PART II – IFC

Revise chapter title as follows:

CHAPTER 7
FIRE-RESISTANCE-RATED CONSTRUCTION
FIRE AND SMOKE PROTECTION FEATURES

Reason: Fire and smoke protection features better reflects the purpose of this chapter. Fire resistance is very one dimensional, while the chapter demands much more than simple fire resistance, including structural fire resistance, firestop systems that protect for fire and smoke, fire, smoke and fire/smoke dampers that protect against fire and smoke, fire doors, fire rated glazing, etc. Additionally, a fire protection feature may provide sound protection in addition to fire and smoke. Therefore, fire and smoke protection features fits the chapter better.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

PART I – IBC FIRE SAFETY
Committee Action:

Approved as Modified

Modify the proposal as follows:

CHAPTER 7
FIRE AND SMOKE PROTECTION FEATURES

Committee Reason: The committee agreed that the proposed title better reflects the purpose of Chapter 7. The modification was to correct a spelling error.

Assembly Action:

None

PART II – IFC
Committee Action:

Disapproved

Committee Reason: The current chapter title is preferred and avoids potential confusion with the current title of Chapter 9. Also, a change could be premature since the ICC Code Technology Committee Fire Safety study group is currently working on a re-write of Chapter 7 which could include a title revision.

Assembly Action:

None

Final Hearing Results

FS160-07/08, Part I	AM
FS160-07/08, Part II	D

Code Change No: **FS163-07/08****Original Proposal**

Sections: 803.1.4, 803.9, 803.11.2, 2603.4.1.2

Proponent: Philip Brazil, PE, Reid Middleton, Inc., representing himself

Revise as follows:

803.1.4 (Supp) Acceptance criteria for textile and expanded vinyl wall or ceiling coverings tested to ASTM E 84 or UL 723. Textile wall and ceiling coverings and expanded wall and ceiling coverings shall have a Class A flame spread index in accordance with ASTM E 84 or UL 723 and be protected by an automatic sprinklers sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2.

TABLE 803.9 (Supp)
INTERIOR WALL AND CEILING FINISH REQUIREMENTS BY OCCUPANCY^k

- I. Applies when the exit enclosures, exit passageways, corridors or rooms and enclosed spaces are protected by a an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2.

(Portions of table and footnotes not shown remain unchanged)

803.11.2 (Supp) Set-out construction. Where walls and ceilings are required to be of fire-resistance-rated or noncombustible construction and walls are set out or ceilings are dropped distances greater than specified in Section 803.11.1, Class A finish materials, in accordance with Section 803.1.1 or 803.1.2, shall be used except where interior finish materials are protected on both sides by an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2, or attached to noncombustible backing or furring strips installed as specified in Section 803.11.1. The hangers and assembly members of such dropped ceilings that are below the main ceiling line shall be of noncombustible materials, except that in Type III and V construction, fire-retardant-treated wood shall be permitted. The construction of each set-out wall shall be of fire-resistance-rated construction as required elsewhere in this code.

2603.4.1.2 Cooler and freezer walls. Foam plastic installed in a maximum thickness of 10 inches (254 mm) in cooler and freezer walls shall:

1. Have a flame spread index of 25 or less and a smoke-developed index of not more than 450, where tested in a minimum 4 inch (102 mm) thickness.
2. Have flash ignition and self-ignition temperatures of not less than 600°F and 800°F (316°C and 427°C), respectively.
3. Have a covering of not less than 0.032-inch (0.8 mm) aluminum or corrosion-resistant steel having a base metal thickness not less than 0.0160 inch (0.4 mm) at any point.
4. Be protected by an automatic sprinkler system in accordance with Section 903.3.1.1. Where the cooler or freezer is within a building, both the cooler or freezer and that part of the building in which it is located shall be sprinklered.

Reason: The changes are proposed for consistency with the use of “automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2 (where applicable)” elsewhere in the 2006 IBC and 2007 IBC Supplement. These are virtually the only instances in the 2006 IBC or 2007 IBC Supplement where consistency is lacking.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The committee agreed that the changes are necessary for consistency with the use of “automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2 (where applicable)” elsewhere in the 2006 IBC and 2007 IBC Supplement

Assembly Action:

None

Final Hearing Results

FS163-07/08

AS

Code Change No: FS164-07/08

Original Proposal

Section: 803.1.4, Chapter 35 (New)

Proponent: Marcelo M. Hirschler, GBH International, representing American Fire Safety Council

1. Revise as follows:

803.1.4 (Supp) Acceptance criteria for textile and expanded vinyl wall or ceiling coverings tested to ASTM E 84 or UL 723. Textile wall and ceiling coverings and expanded vinyl wall and ceiling coverings shall have a Class A flame spread index in accordance with ASTM E 84 or UL 723 and be protected by automatic sprinklers installed in accordance with Section 903.3.1.1 or 903.3.1.2. Test specimen preparation and mounting shall be in accordance with ASTM E 2404.

2. Add new standard to Chapter 35 as follows:

ASTM

E 2404-06Standard Practice for Specimen Preparation and Mounting of Textile, Paper or Vinyl Wall or Ceiling Coverings to Assess Surface Burning Characteristics

Reason: This proposal recommends that a standard practice be referenced for testing textile wall and ceiling coverings and expanded vinyl wall and ceiling coverings in the Steiner tunnel test, ASTM E 84. The committee on fire standards, ASTM E05, developed a standard practice, entitled **Standard Practice for Specimen Preparation and Mounting of Textile, Paper or Vinyl Wall or Ceiling Coverings to Assess Surface Burning Characteristics**, specifically for a mandatory way of preparing test specimens and mounting them in the tunnel. This replaces optional guidance on mounting methods found in the Appendix of ASTM E 84 and ensures testing consistency.

This proposal also corrects a typo, by adding the missing word vinyl.

Cost Impact: This proposal should not increase the cost of construction.

Public Hearing Results

Note: The following analysis was not in the Code Change Proposal book but was posted on the ICC website.

Analysis: Review of proposed new standard ASTM E2404-06 indicated that, in the opinion of ICC Staff, the standard did comply with ICC standards criteria.

Committee Action:

Approved as Submitted

Committee Reason: The committee agreed that the proposed test method, ASTM E2404, was the appropriate test method because it deals specifically with textile, paper or vinyl wall or ceiling coverings.

Assembly Action:

None

Final Hearing Results

FS164-07/08

AS

Code Change No: **FS165-07/08**

Original Proposal

Sections: 803.9 (New); IFC 803.8 (New)

Proponent: Jim Lathrop, Koffel Associates, Inc., representing Bobrick

THESE PROPOSALS ARE ON THE AGENDA OF THE IBC FIRE SAFETY AND THE IFC CODE DEVELOPMENT COMMITTEES AS 2 SEPARATE CODE CHANGES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IBC FIRE SAFETY

Add new text as follows:

803.9 High Density Polyethylene (HDPE). Where high density polyethylene is used as an interior finish it shall comply with Section 803.1.2. (Supp)

(Renumber subsequent sections)

PART II – IFC

Add new text as follows:

803.8 High Density Polyethylene (HDPE). Where high density polyethylene is used as an interior finish it shall comply with Section 803.1.2. (Supp) of the IBC

Reason: HDPE is a thermoplastic that when it burns gives off considerable energy and produces a pooling flammable liquids fire. Recent full scale room-corner tests using NFPA 286 have demonstrated a significant hazard. These tests had to be terminated prior to the standard 15 minute duration due to flashover occurring, yet there was still much of the product left to burn. Extensive flammable liquid pool fires occurred during the tests. Yet this same material when tested in accordance with the tunnel test, ASTM E-84, is often given a FSI of 25 or less. However the resulting test is so intense some labs will not test HDPE partitions in their tunnel due to the damage it can do to the tunnel. This proposal will assure that when using HDPE partitions they will be formulated in such a manner to reduce the hazard that they present. Following is some of the data from one of the NFPA 286 tests: Peak HRR (excl burner) 1733 kW; Total Heat Released (excl. burner) 121 MJ; Peak Heat Flux to the floor 35.2 kW/m²; Peak Avg Ceiling Temp 805°C, 1481°F

Cost Impact: NFPA 286 is a more expensive test than is ASTM E-84 however it yields usable data that ASTM E-84 does not, and the test arrangement is more representative of how the product is used.

Public Hearing Results

PART I – IBC FIRE SAFETY

Committee Action:

Approved as Modified

Modify the proposal as follows:

803.9 High Density Polyethylene (HDPE). Where high density polyethylene is used as an interior finish it shall comply with the requirements of Section 803.1.2. (Supp)

Committee Reason: The committee agreed that these products are being used and there performance is critical to public health and safety; therefore these products should be regulated and this proposal is appropriate. The modification results in more enforceable language.

Assembly Action:

None

PART II – IFC

Committee Action:

Approved as Submitted

Committee Reason: This change identifies a known interior finish hazard, provides retroactive regulation of it and is consistent with the action taken by the IBC-FS Committee.

Assembly Action:

None

Final Hearing Results

F165-07/08, Part I	AM
F165-07/08, Part II	AS

Code Change No: FS167-07/08

Original Proposal

Sections: 803.9 (New), 202 (New), Chapter 35 (New)

Proponent: Marcelo M. Hirschler, GBH International, representing American Fire Safety Council

1. Add new text as follows:

803.9 Site-fabricated stretch systems. Where used as interior wall or interior ceiling finish materials, site-fabricated stretch systems shall be tested in the manner intended for use, and shall comply with the requirements of Section 803.1.1 or 803.1.2. If the materials are tested in accordance with ASTM E 84 or UL 723, specimen preparation and mounting shall be in accordance with ASTM E 2573.

(Renumber subsequent sections)

2. Add new definition as follows:

Site-fabricated stretch system. A system, fabricated on site and intended for acoustical, tackable or aesthetic purposes, that is comprised of three elements: (a) a frame (constructed of plastic, wood, metal or other material) used to hold fabric in place, (b) a core material (infill, with the correct properties for the application), and (c) an outside layer, comprised of a textile, fabric or vinyl, that is stretched taut and held in place by tension or mechanical fasteners via the frame.

3. Add new standard to Chapter 35 as follows:

ASTM

<u>E 2573-07</u>	<u>Standard Practice for Specimen Preparation and Mounting of Site-Fabricated Stretch Systems to Assess Surface Burning Characteristics</u>
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Reason: The ASTM committee on fire standards, ASTM E05, has issued a standard practice, ASTM E 2573, Standard practice for specimen preparation and mounting of site-fabricated stretch systems. Until now there was no correct mandatory way to test these systems. These systems are now being used extensively because they can stretch to cover decorative walls and ceilings with unusual looks and shapes. The systems consist of three parts: a fabric (or vinyl), a frame and an infill core material. The testing has often been done of each component separately instead of testing the composite system. That is an inappropriate way to test and not the safe way to conduct the testing. Now that a consensus standard method of testing exists, the code should recognize it. The proposed definition was taken from the standard, ASTM E 2573, word for word.

This type of product is not exclusive to any individual manufacturer. Three examples, taken from different manufacturers, are shown as illustrations.



Cost Impact: This code change proposal should not increase the cost of construction.

Public Hearing Results

Note: The following analysis was not in the Code Change Proposal book but was posted on the ICC website.

Analysis: Review of proposed new standard ASTM E2573-07 indicated that, in the opinion of ICC Staff, the standard did comply with ICC standards criteria.

Committee Action:

Approved as Submitted

Committee Reason: The committee agreed that site-fabricated stretch systems are now being used extensively and that since a standard has been developed to deal with the mounting of such systems to determine surface burning characteristics (ASTM E2573), the systems should be regulated in the code.

Assembly Action:

None

Final Hearing Results

FS167-07/08

AS

Code Change No: FS168-07/08

Original Proposal

Section: 803.11.4

Proponent: Douglas H. Evans, PE, Clark County, NV, representing Department of Development Services

Revise as follows:

803.11.4 (Supp) Materials. An interior wall or ceiling finish that is not more than 0.25 inch (6.4 mm) thick shall be applied directly against a noncombustible backing.

Exceptions:

1. ~~Class A materials, in accordance with Section 803.1.1 or 803.1.2.~~ Non-combustible materials.
2. Materials where the qualifying tests were made with the material suspended or furred out from the noncombustible backing.

Reason: Taking into account how the E 84 test is performed, this code allowance has no basis in physics. Most thin combustible materials take on the burning characteristics of their substrate. In the E 84 furnace, thin combustible materials are held in place with chicken wire on top of one-quarter inch metal rods two feet on center down the length of the furnace. As tested, the substrate is the noncombustible lid of the furnace. The fire dynamics issue has to do with mass to surface burning ratio. The more surface, and less mass, exposed to oxygen and heat, the more apt a material is to burn (dust explosions are one example). As such, many thin combustible materials can obtain a Class A rating, but may readily burn when they have no substrate and are exposed to an ignition source. The paper on drywall is one such example.

An additional concern is the potential for adverse interaction with sprinklers. If a fire originates between four heads, when the heat plume impinges on the thin combustible ceiling, there is no assurance that sprinklers in the plane of the membrane will activate prior to the membrane deteriorating. If the membrane degrades from the heat, the heat will enter the void above the membrane and the sprinklers protecting the void will activate. Sprinklers above the membrane will then pre-wet the membrane and the sprinkler piping penetrating the membrane. This situation may allow the fire to spread below the membrane.

Cost Impact: It is unlikely this subject impacts most interior finish installations, but for those impacted, the cost of construction will increase.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The committee agreed that the term "non-combustible" was more appropriate for exception #1 to Section 803.11.4 based on the fact that some materials that can qualify as Class A materials really are not intended to be under the scope of this exception because they may readily burn if not installed on a noncombustible backing.

Assembly Action:

None

Final Hearing Results

FS168-07/08

AS

Code Change No: **FS169-07/08**

Original Proposal

Section: 804.4.1

Proponent: Tom Lariviere, Fire Department, Madison, MS, representing Joint Fire Service Review Committee

Revise as follows:

804.4.1 Minimum critical radiant flux. Interior floor finish and floor covering materials in exit enclosures, exit passageways and corridors shall not be less than Class I in Groups I-1, I-2 and I-3 and not less than Class II in Groups A, B, E, H, I-4, M, R-1, R-2 and S. In all areas, floor covering materials shall comply with the DOCFF-1 “pill test” (CPSC 16 CFR, Part 1630).

Exception: Where a building is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2, Class II materials are permitted in any area where Class I materials are required, and materials complying with the DOC FF-1 “pill test” (CPSC 16 CFR, Part 1630) are permitted in any area where Class II materials are required.

Reason: This proposal requires a fire rating for floor covering materials in I-1 occupancies. In Group I-1 occupancies clients/patients are located for over 24 hours and this will provide a higher level of safety for these facilities and provide consistency between the IBC and Federal Regulations.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The committee agreed that Group I-1 occupancies should be required to have minimum critical radiant flux of Class I for floor finishes and floor coverings in exit enclosures, exit passageways and corridors based on similar levels of hazards associated with other Groups that are currently required to meet Class I (I-2, I-3). This will also provide consistency between the IBC and Federal Regulations.

Assembly Action:

None

Final Hearing Results

FS169-07/08

AS

Code Change No: **FS171-07/08**

Original Proposal

Section: 909.20.5

Proponent: Maureen Traxler, City of Seattle, WA, representing Department of Planning & Development; John H. Klote, John H. Klote, Inc.; Douglas H. Evans, Clark County, NV, representing Department of Development Services; Assistant Chief Kenneth L. Tipler, Fire Marshall, City of Seattle, WA, representing Seattle Fire Department

Revise as follows:

909.20.5 Stair pressurization alternative. Where the building is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1, the vestibule is not required, provided that interior exit stairways are pressurized to a minimum of 0.15 0.10 inches of water (~~37~~ 25 Pa) and a maximum of 0.35 inches of water (87 Pa) in the shaft relative to the building measured with all stairway doors closed under maximum anticipated ~~stack pressures~~ conditions of stack effect and wind effect.

Reason: The proposal changes the minimum stair pressurization from 0.15 to 0.10 inches of water. This easing of the pressurization requirement will reduce the cost and complexity of pressurized stairs, while retaining the full protection of pressurized stairs. A pressure difference of 0.10 inches of water is sufficient to prevent smoke from infiltrating the stairs under the extreme condition of a fully-involved fire in the space next to the stair door. This is supported by both engineering analysis and full scale fire tests (see NFPA 92A 2006; Klote and Milke 2002).

While at NIST, Dr. John Klote did a series of full-scale fire tests at the Plaza Hotel Building in Washington, D.C. In these fires, the section of a corridor near the stairs was fully involved in fire. In these tests, a pressure difference of 0.10 inches controlled smoke from very large fires that were only a few feet away from the stairway door. Another test consisted of a room fire that flashed over and remained at fully-developed conditions for some time. A number of other full scale tests have confirmed that pressurization can control smoke from extremely large fires. These tests show that 0.10 inches of water is sufficient to control smoke with a flashed over fire anywhere on the floor even when it is in the corridor next to the stair door.

Cost Impact: This code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: Based on recent research on stair pressurization the committee felt that changing the minimum stair pressurization from 0.15 to 0.10 inches of water was appropriate and that the phrase "conditions of stack effect and wind effect" more appropriately describe what stack pressures were.

Assembly Action:

None

Final Hearing Results

FS171-07/08

AS

Code Change No: FS172-07/08

Original Proposal

Section: 909.20.6.1

Proponent: Lee J. Kranz, City of Bellevue, representing The Washington Association of Building Officials (WABO), Technical Code Development Committee

Revise as follows:

909.20.6.1 (Supp) Ventilation systems. Smokeproof enclosure ventilation systems shall be independent of other building ventilation systems. The equipment, control wiring, power wiring and ductwork shall comply with one of the following:

1. Equipment, control wiring, power wiring and ductwork shall be located exterior to the building and directly connected to the smokeproof enclosure or connected to the smokeproof enclosure by ductwork enclosed by not less than 2-hour fire barriers constructed in accordance with Section 706 or horizontal assemblies constructed in accordance with Section 711, or both.
2. Equipment, control wiring, power wiring and ductwork shall be located within the smokeproof enclosure with intake or exhaust directly from and to the outside or through ductwork enclosed by not less than 2-hour fire barriers constructed in accordance with Section 706 or horizontal assemblies constructed in accordance with Section 711, or both.
3. Equipment, control wiring, power wiring and ductwork shall be located within the building if separated from the remainder of the building, including other mechanical equipment, by not less than 2-hour fire barriers constructed in accordance with Section 706 or horizontal assemblies constructed in accordance with Section 711, or both.

Exceptions:

1. Control wiring and power wiring utilizing a 2-hour rated cable or cable system.
2. Where incased with not less than 2" of concrete.

CODE CHANGES RESOURCE COLLECTION – INTERNATIONAL BUILDING CODE

Reason: Smokeproof enclosure ventilation systems, including stair enclosures required to be pressurized in accordance with IBC Section 1020.1.7, must have pressurization equipment and ductwork protected to the same fire resistance rating as the shaft they serve per Section 909.20.6.1. This code change will help to insure the system will function properly in the event of a fire in order to maintain a tenable environment for safe means of egress. The proposed change clarifies that control wiring and power wiring serving the pressurization fan are critical equipment components that must also be protected to insure overall system viability. The exceptions are intended to allow listed 2 hour rated wiring and/or 2" of concrete coverage (as permitted in NEC Section 230.6) as an acceptable alternative to fire rated barriers

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The committee agreed that the proposed change appropriately addresses control wiring and power wiring serving the pressurization fan that are critical equipment components that should also be protected. Further, the exceptions appropriately allow listed 2 hour rated wiring and/or 2" of concrete coverage as acceptable alternatives to fire rated barriers. This is consistent with requirements currently in the NFPA 70.

Assembly Action:

None

Final Hearing Results

FS172-07/08

AS

Code Change No: FS173-07/08

Original Proposal

Section: 1402.1

Proponent: Robert McCluer, RMc Code Consulting, representing Metal Construction Association

Revise definition as follows:

**SECTION 1402
DEFINITIONS**

METAL COMPOSITE MATERIAL (MCM) SYSTEM. An exterior wall ~~finish system~~ covering fabricated using MCM in a specific assembly including joints, seams, attachments, substrate, framing and other details as appropriate to a particular design.

Reason: The term exterior wall finish system is often associated only with the exterior insulation and finish systems (EIFS) that are commonly used as wall covering materials. A more proper reference to the defined term, Exterior Wall Covering, will avoid any confusion that may occur and the need to further specify what sections of the code apply to MCM.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The committee agreed that the term exterior wall finish system is often associated only with the exterior insulation and finish systems (EIFS) that are commonly used as wall covering materials; therefore replacing "finish system" with "covering" in the definition of Metal Composite Material System is appropriate.

Assembly Action:

None

Final Hearing Results

FS173-07/08

AS

Code Change No: **FS175-07/08**

Original Proposal

Sections: 202, 1402, 1403.2, 1404.11 (New), 1408 (New), 1412.1 (New), Chapter 35; IRC 202, R703.9 through R703.9.4.2 (New), Chapter 43

Proponent: Jesse J. Beitel, Hughes Associates, representing the EIFS Industry Members Association

THIS PROPOSAL IS ON THE AGENDA OF THE IBC FIRE SAFETY AND IRC BUILDING/ENERGY CODE DEVELOPMENT COMMITTEES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IBC FIRE SAFETY

1. Add new definitions as follows:

SECTION 202 DEFINITIONS

EXTERIOR INSULATION AND FINISH SYSTEMS (EIFS). See Section 1402.1

EXTERIOR INSULATION AND FINISH SYSTEMS (EIFS) WITH DRAINAGE. See Section 1402.1

SECTION 1402 DEFINITIONS

EXTERIOR INSULATION AND FINISH SYSTEMS (EIFS). EIFS are nonstructural, non-load bearing, exterior wall cladding systems that consist of an insulation board attached either adhesively or mechanically, or both, to the substrate; an integrally reinforced base coat; and a textured protective finish coat.

EXTERIOR INSULATION AND FINISH SYSTEMS (EIFS) WITH DRAINAGE. An EIFS that incorporates a means of drainage applied over a water-resistive barrier.

2. Revise as follows:

1403.2 Weather protection. Exterior walls shall provide the building with a weather-resistant exterior wall envelope. The exterior wall envelope shall include flashing, as described in Section 1405.3. The exterior wall envelope shall be designed and constructed in such a manner as to prevent the accumulation of water within the wall assembly by providing a water-resistive barrier behind the exterior veneer, as described in Section 1404.2, and a means for draining water that enters the assembly to the exterior. Protection against condensation in the exterior wall assembly shall be provided in accordance with the *International Energy Conservation Code*.

Exceptions:

1. A weather-resistant exterior wall envelope shall not be required over concrete or masonry walls designed in accordance with Chapters 19 and 21, respectively.
2. Compliance with the requirements for a means of drainage, and the requirements of Sections 1404.2 and 1405.3, shall not be required for an exterior wall envelope that has been demonstrated through testing to resist wind-driven rain, including joints, penetrations and intersections with dissimilar materials, in accordance with ASTM E 331 under the following conditions:
 - 2.1. Exterior wall envelope test assemblies shall include at least one opening, one control joint, one wall/eave interface and one wall sill. All tested openings and penetrations shall be representative of the intended end-use configuration.
 - 2.2. Exterior wall envelope test assemblies shall be at least 4 feet by 8 feet (1219 mm by 2438 mm) in size.
 - 2.3. Exterior wall envelope assemblies shall be tested at a minimum differential pressure of 6.24 pounds per square foot (psf) (0.297 kN/m²).
 - 2.4. Exterior wall envelope assemblies shall be subjected to a minimum test exposure duration of 2 hours.
3. Exterior Insulation and Finish System (EIFS) complying with Section 1408.4.1

3. Add new text as follows:

1404.11 Exterior Insulation and finish system. Exterior Insulation and Finish System (EIFS) shall comply with ASTM E 2568. Exterior Insulation and Finish System (EIFS) with Drainage shall comply with ASTM E 2568 and ASTM E 2273.

SECTION 1408
EXTERIOR INSULATION AND FINISH SYSTEMS (EIFS)

1408.1 General. The provisions of this section shall govern the materials, construction and quality of Exterior Insulation and Finish Systems (EIFS) for use as exterior wall coverings in addition to other applicable requirements of Chapters 7, 14, 16, 17 and 26.

1408.2 Performance characteristics. EIFS shall be constructed such that it meets the performance characteristics required in ASTM E 2568.

1408.3 Structural design. The underlying structural framing and substrate shall be designed and constructed to resist loads as required by Chapter 16.

1408.4 Weather resistance. EIFS shall comply with Section 1403 and shall be designed and constructed to resist wind and rain in accordance with this section and the manufacturer's application instructions.

1408.4.1 EIFS with drainage. EIFS with drainage shall meet the requirements of ASTM E 2273 and is required on framed walls of Type V Construction, Group R1, R2, R3, and R4 occupancies.

1408.4.1.1 For EIFS with drainage, the water-resistive barrier shall comply with Section 1404.2 or ASTM E 2570.

1408.5 Installation. Installation of the EIFS and EIFS with Drainage shall be in accordance with the EIFS manufacturer's instructions.

1408.6 Special Inspections. EIFS installations shall comply with the provisions of Sections 1704.1 and 1704.12.

1704.12.1 Water-resistive barrier coating. A water-resistive barrier coating complying with ASTM E 2570 requires special inspection of the water-resistive barrier coating when installed over a sheathing substrate.

4. Add new standards to Chapter 35 as follows:

ASTM

<u>E 2273-03</u>	<u>Standard Test Method for Determining the Drainage Efficiency of Exterior Insulation and Finish Systems (EIFS) Clad Wall Assemblies</u>
<u>E 2568-07</u>	<u>Standard Specification for PB Exterior Insulation and Finish Systems (EIFS)</u>
<u>E 2570-07</u>	<u>Standard Test Method for Evaluating Water-Resistive Barrier (WRB) Coatings Used Under Exterior Insulation and Finish Systems (EIFS) for EIFS with Drainage</u>

PART II – IRC BUILDING/ENERGY

1. Add new definitions as follows:

EXTERIOR INSULATION AND FINISH SYSTEMS (EIFS). EIFS are nonstructural, non-load bearing, exterior wall cladding systems that consist of an insulation board attached either adhesively or mechanically, or both, to the substrate; an integrally reinforced base coat; and a textured protective finish coat.

EXTERIOR INSULATION AND FINISH SYSTEMS (EIFS) WITH DRAINAGE. An EIFS that incorporates a means of drainage applied over a water-resistive barrier.

2. Delete and substitute as follows:

~~**R703.9 Exterior insulation finish systems, general.** All Exterior Insulation Finish Systems (EIFS) shall be installed in accordance with the manufacturer's installation instructions and the requirements of this section. Decorative trim shall not be face-nailed through the EIFS. The EIFS shall terminate not less than 6 inches (152 mm) above the finished ground level.~~

R703.9.1 Water-resistive barrier. All EIFS shall have a water-resistive barrier applied between the underlying water-sensitive building components and the exterior insulation, and a means of draining water to the exterior of the veneer. A water-resistive barrier shall be compliant with ASTM D226 Type I asphalt saturated felt or equivalent, shall be applied horizontally with the upper layer lapped over the lower layer not less than 2 inches (51 mm), and shall have all vertical joints lapped not less than 6 inches (152 mm).

R703.9.2 Flashing, general. Flashing of EIFS shall be provided in accordance with the requirements of Section R703.8.

R703.9 Exterior Insulation and Finish System (EIFS)/EIFS with drainage

R703.9.1 Exterior Insulation and Finish System (EIFS). EIFS shall comply with ASTM E 2568.

R703.9.2 Exterior Insulation and Finish System (EIFS) with drainage. EIFS with drainage shall comply with ASTM E 2568 and ASTM E 2273.

R703.9.2.1 Water-resistive barrier. The water-resistive barrier shall comply with Section R703.2 or ASTM E 2570.

R703.9.2.2 Installation. The water-resistive barrier shall be applied over all building components.

Exception: A water-resistive barrier shall not be required over concrete or masonry walls designed in accordance with Chapter 6 and flashed according to Section R703.7 or R703.8.

R703.9.3 Flashing, general. Flashing of EIFS shall be provided in accordance with the requirements of Section R703.8

R703.9.4 EIFS/EIFS with drainage installation. All EIFS shall be installed in accordance with the manufacturer's installation instructions and the requirements of this section.

R703.9.4.1 Terminations. The EIFS shall terminate not less than 6 inches (152 mm) above the finished ground level.

R703.9.4.2 Decorative trim. Decorative trim shall not be faced nailed though the EIFS.

3. Add standards to Chapter 43 as follows:

ASTM

<u>E 2273-03</u>	<u>Standard Test Method for Determining the Drainage Efficiency of Exterior Insulation and Finish Systems (EIFS) Clad Wall Assemblies</u>
<u>E 2568-07</u>	<u>Standard Specification for PB Exterior Insulation and Finish Systems (EIFS)</u>
<u>E 2570-07</u>	<u>Standard Test Method for Evaluating Water-Resistive Barrier (WRB) Coatings Used Under Exterior Insulation and Finish Systems (EIFS) for EIFS with Drainage</u>

Reason: (IBC) Exterior Insulation and Finish Systems (EIFS) are non-load bearing, exterior wall coverings and have been used successfully in North America in both residential and commercial applications.

The use of EIFS in North America in the mid-1970's was due in large measure to the oil embargo and the resultant surge in interest in high energy efficiency wall systems, in addition to the aesthetics of the exterior appearance of the cladding. Today, EIFS are used extensively all over North America and in many others areas around the world, particularly in Europe and the Pacific Rim. EIFS have been used in the United States for more than thirty years and hold the #1 market share for all commercial claddings.

Because EIFS represented a relatively new concept in building technology at the time of its introduction in North America, it has become one of the most exhaustively tested cladding systems available on the market today. EIFS has been exposed to extensive ASTM / NFPA tests for fire performance, impact resistance, accelerated weathering, and a host of other conditions and performance attributes.

As EIFS were introduced into the U.S., the industry worked with the Evaluation Services of the three legacy Codes to develop Acceptance Criteria that included test requirements and criteria for its applications. Based on this work, the various manufacturers received ES Reports for their products and their various applications.

Existing IBC Section 1704.12 provides some EIFS specific requirements and there are many other existing code chapters/sections (Chapters 14, 16, 26, etc) that although not EIFS specific, do apply to EIFS. Additionally, existing ICC ES Acceptance Criteria (AC 235, AC 219, AC 212, etc.) further establish requirements for EIFS or related components and, based on these criteria, numerous EIFS manufacturers hold evaluation reports to demonstrate code compliance. Currently, the ES Reports provide the primary acceptance mechanism for EIFS.

The purpose of the proposed code change is to further develop existing code language based in part on newly adopted ASTM standards that are specific to EIFS. The following table provides a cross reference to the sections of the ASTM Standards that were previously addressed with the various requirements in the ICC Acceptance Criteria. The AC 219 "Acceptance Criteria for Exterior Insulation and Finish Systems" was converted to ASTM E 2568. The AC 235 "Acceptance Criteria for EIFS Clad Drainage Wall Assemblies" is the same as AC 219 but with the added requirement to test for Drainage Efficiency in accordance with ASTM E 2273. The AC 212 "Acceptance Criteria for Water-Resistive Barrier Coatings Used as Water-Resistive Barriers Over Exterior Sheathing" was converted to ASTM E 2570.

CODE CHANGES RESOURCE COLLECTION – INTERNATIONAL BUILDING CODE

EIFS and EIFS with Drainage

AC 219 & 235 Test Requirements	ASTM E 2568	Difference between standards
Salt Spray – Section 4.2 ASTM B 117	Section 5.1.1 ASTM B 117	None
Tensile Bond – Section 4.3 ASTM C 297 or E 2134 ¹	Section 5.1.1 ASTM C 297 or E 2134	None
Freeze Thaw - Section 4.4 ICC ES Procedure ²	Section 5.1.1 ASTM E 2485 Section 9.2	None
Water Resistance – Section 4.5 ASTM D 2247	Section 5.1.1 ASTM D 2247	None
Fire Endurance – Section 4.6.1 ASTM E 119	Section 5.3.1 ASTM E 119	None
Noncombustible Construction – Section 4.6.2 NFPA 285	Section 5.3.1 NFPA 285	None
Ignition Resistance – Section 4.6.2 NFPA 268	Section 5.3.1 NFPA 268	None
Surface Burning – Section 4.6.2 ASTM E 84	Section 5.4 ASTM E 84	None
Structural Performance/Wind Load – Section 4.7.1 ASTM E 330	Section 5.5 ASTM E 330	None
Wind Driven Rain/Water Penetration – Section 4.8.1 ASTM E 331	Section 5.1.1 ASTM E331	None
Accelerated Weathering – Section 4.9 ASTM G153 or G 155	Section 5.1.1 ASTM G 153 or G 155	None
Drainage Test – Section 4.10 ASTM E 2273	Not applicable covered in Section 1404.12 of proposed code change	

Water-Resistive Barrier Coating

AC 212 Test Requirements	ASTM E 2570	Difference between standards
Tensile Bond – Section 4.1 ASTM C 297 or E 2134 ¹	Sect. 8.1.1 Conduct tests in accordance with ASTM C 297 or E 2134	None
Freeze Thaw - Section 4.2 ICC ES Procedure ²	Section 8.2.1 Conduct tests in accordance with ASTM E 2485 Section 9.2	None
Water Resistance – Section 4.3 ASTM D 2247	Section 8.3.1 Conduct tests in accordance with ASTM D 2247	None
Water Vapor Transmission – Section 4.4 ASTM E 96	Section 8.4.2 Conduct tests in accordance with ASTM E 96 Section 12	None
Water Penetration – Section 4.4 ASTM E 331	Section 8.5.4.1 Conduct tests in accordance with ASTM E 331	None
Durability <ul style="list-style-type: none"> • Transverse load – Section 4.4.1 ASTM E 1233 Proc. A • Racking – Section 4.6.2 ASTM E 72 • Environmental Conditioning – Section 4.6.3 ASTM E 2570 • Water Penetration – Section 4.7.4 ASTM E 331 	Section 8.5.1.1 Test specimen in accordance with ASTM E 1233 Proc. A Section 8.5.2.1 Apply load per ASTM E 72 Section 8.5.3 ³ Section 8.5.4.1 Conduct tests in accordance with ASTM E 331	None None None None
Weathering <ul style="list-style-type: none"> • Ultraviolet Light Exposure – Section 4.8.1 ICC ES procedure • Wet/Dry Cycling – Section 4.8.2 ICC ES procedure • Hydrostatic Pressure – Section 4.8.3 AATCC Test Method 127-1985 	Section 8.6.1.1 Test specimens in accordance with ASTM D 2898 ⁴ Section 8.6.2.1 ⁵ Section 8.6.3.1 Samples shall be tested in accordance with Method 127-1985	None None None

¹ ASTM E 2134 is specifically for EIFS; ASTM C 297 is generic

² ICC ES procedure was converted to ASTM E 2485

³ ICC ES procedure is listed in Section 8.5.3 of ASTM E 2570

⁴ ASTM D 2898 is referenced with ICC ES conditions noted

⁵ ICC ES procedure is listed in Section 8.6.2.1 of ASTM E 2570

In summary, the establishment of an EIFS specific code section that includes references to other applicable code sections and nationally recognized standards will enable building officials to determine code compliance for these well established systems in a manner that is consistent with other building materials currently in the IBC.

(IRC) Exterior Insulation and Finish Systems (EIFS) are non-load bearing, exterior wall coverings and have been used successfully in North America in both One and Two Family Dwellings as well as commercial applications.

The use of EIFS in North America in the mid-1970's was due in large measure to the oil embargo and the resultant surge in interest in high energy efficiency wall systems, in addition to the aesthetics of the exterior appearance of the cladding. Today, EIFS are used extensively all over North America and in many others areas around the world, particularly in Europe and the Pacific Rim. EIFS have been used in the United States for more than thirty years and hold the #1 market share for all commercial claddings.

Because EIFS represented a relatively new concept in building technology at the time of its introduction in North America, it has become one of the most exhaustively tested cladding systems available on the market today. EIFS has been exposed to extensive ASTM / NFPA tests for fire performance, impact resistance, accelerated weathering, and a host of other conditions and performance attributes.

As EIFS were introduced into the U.S., the industry worked with the Evaluation Services of the three legacy Codes to develop Acceptance Criteria that included test requirements and criteria for its applications. Based on this work, the various manufacturers received ES Reports for their products and their various applications.

Existing IRC Section R703.9 provides some EIFS specific requirements. Additionally, existing ICC ES Acceptance Criteria (AC 235, AC 219, AC 212, etc.) further establish requirements for EIFS or related components and, based on these criteria, numerous EIFS manufacturers hold evaluation reports to demonstrate code compliance. Currently, the ES Reports provide the primary acceptance mechanism for EIFS.

The purpose of the proposed code change is to further develop existing code language based in part on newly adopted ASTM standards that are specific to EIFS. The following table provides a cross reference to the sections of the ASTM Standards that were previously addressed with the various requirements in the ICC Acceptance Criteria. The AC 219 "Acceptance Criteria for Exterior Insulation and Finish Systems" was converted to ASTM E 2568. The AC 235 "Acceptance Criteria for EIFS Clad Drainage Wall Assemblies" is the same as AC 219 but with the added requirement to test for Drainage Efficiency in accordance with ASTM E 2273. The AC 212 "Acceptance Criteria for Water-Resistive Barrier Coatings Used as Water-Resistive Barriers Over Exterior Sheathing" was converted to ASTM E 2570.

EIFS and EIFS with Drainage

AC 219 & 235 Test Requirements	ASTM E 2568	Difference between standards
Salt Spray – Section 4.2 ASTM B 117	Section 5.1.1 ASTM B 117	None
Tensile Bond – Section 4.3 ASTM C 297 or E 2134 ¹	Section 5.1.1 ASTM C 297 or E 2134	None
Freeze Thaw - Section 4.4 ICC ES Procedure ²	Section 5.1.1 ASTM E 2485 Section 9.2	None
Water Resistance – Section 4.5 ASTM D 2247	Section 5.1.1 ASTM D 2247	None
Fire Endurance – Section 4.6.1 ASTM E 119	Section 5.3.1 ASTM E 119	None
Noncombustible Construction – Section 4.6.2 NFPA 285	Section 5.3.1 NFPA 285	None
Ignition Resistance – Section 4.6.2 NFPA 268	Section 5.3.1 NFPA 268	None
Surface Burning – Section 4.6.2 ASTM E 84	Section 5.4 ASTM E 84	None
Structural Performance/Wind Load – Section 4.7.1 ASTM E 330	Section 5.5 ASTM E 330	None
Wind Driven Rain/Water Penetration – Section 4.8.1 ASTM E 331	Section 5.1.1 ASTM E331	None
Accelerated Weathering – Section 4.9 ASTM G153 or G 155	Section 5.1.1 ASTM G 153 or G 155	None
Drainage Test – Section 4.10 ASTM E 2273	Not applicable covered in Section 1404.12 of proposed code change	

CODE CHANGES RESOURCE COLLECTION – INTERNATIONAL BUILDING CODE

Water-Resistive Barrier Coating

AC 212 Test Requirements	ASTM E 2570	Difference between standards
Tensile Bond – Section 4.1 ASTM C 297 or E 2134 ¹	Sect. 8.1.1 Conduct tests in accordance with ASTM C 297 or E 2134	None
Freeze Thaw - Section 4.2 ICC ES Procedure ²	Section 8.2.1 Conduct tests in accordance with ASTM E 2485 Section 9.2	None
Water Resistance – Section 4.3 ASTM D 2247	Section 8.3.1 Conduct tests in accordance with ASTM D 2247	None
Water Vapor Transmission – Section 4.4 ASTM E 96	Section 8.4.2 Conduct tests in accordance with ASTM E 96 Section 12	None
Water Penetration – Section 4.4 ASTM E 331	Section 8.5.4.1 Conduct tests in accordance with ASTM E 331	None
Durability <ul style="list-style-type: none"> • Transverse load – Section 4.4.1 ASTM E 1233 Proc. A • Racking – Section 4.6.2 ASTM E 72 • Environmental Conditioning – Section 4.6.3 ASTM E 2570 • Water Penetration – Section 4.7.4 ASTM E 331 	Section 8.5.1.1 Test specimen in accordance with ASTM E 1233 Proc. A Section 8.5.2.1 Apply load per ASTM E 72 Section 8.5.3 ³ Section 8.5.4.1 Conduct tests in accordance with ASTM E 331	None None None None
Weathering <ul style="list-style-type: none"> • Ultraviolet Light Exposure – Section 4.8.1 ICC ES procedure • Wet/Dry Cycling – Section 4.8.2 ICC ES procedure • Hydrostatic Pressure – Section 4.8.3 AATCC Test Method 127-1985 	Section 8.6.1.1 Test specimens in accordance with ASTM D 2898 ⁴ Section 8.6.2.1 ⁵ Section 8.6.3.1 Samples shall be tested in accordance with Method 127-1985	None None None

¹ ASTM E 2134 is specifically for EIFS; ASTM C 297 is generic

² ICC ES procedure was converted to ASTM E 2485

³ ICC ES procedure is listed in Section 8.5.3 of ASTM E 2570

⁴ ASTM D 2898 is referenced with ICC ES conditions noted

⁵ ICC ES procedure is listed in Section 8.6.2.1 of ASTM E 2570

In summary, the establishment of an EIFS specific code section that includes references to other applicable code sections and nationally recognized standards will enable building officials to determine code compliance for these well established systems in a manner that is consistent with other building materials currently in the IRC.

Cost Impact: This code change will not increase the cost of construction.

Public Hearing Results

Note (Part I and Part II): The following analysis was not in the Code Change Proposal book but was posted on the ICC website.

Analysis: Review of proposed new standard ASTM E2273-03 indicated that, in the opinion of ICC Staff, the standard did not comply with ICC standards criteria (Section 3.6.2.9).

Note (Part I and Part II): The following analysis was not in the Code Change Proposal book but was posted on the ICC website.

Analysis: Review of proposed new standard ASTM E2568-07 and ASTM E2570-07 indicated that, in the opinion of ICC Staff, the standard did comply with ICC standards criteria.

PART I – IBC FIRE SAFETY

Committee Action:

Approved as Modified

Modify the proposal as follows:

1404.11 Exterior Insulation and finish system. Exterior Insulation and Finish System (EIFS) shall comply with ~~ASTM E 2568~~ and Exterior Insulation and Finish System (EIFS) with Drainage shall comply with Section 1408 ~~ASTM E 2568 and ASTM E 2273~~.

1408.4.1 EIFS with drainage. EIFS with drainage shall have an average minimum drainage efficiency of 90 percent when tested in accordance ~~meet~~ the requirements of ASTM E 2273 and is required on framed walls of Type V Construction, Group R1, R2, R3, and R4 occupancies.

(Portions of proposal not shown remain unchanged)

Committee Reason: The committee indicated that the proposed requirements for exterior insulation and finish systems with and without drainage are technically accurate and complete and are therefore an appropriate addition to the code. The modification to Section 1404.11 references Section 1408, which contains reference to the standards that have been struck. The modification to Section 1408.4.11 provides appropriate pass/fail criteria for the drainage systems.

Assembly Action: **None**

**PART II – IRC B/E
Committee Action:**

Approved as Modified

Modify proposal as follows:

R703.9.2 Exterior Insulation and Finish System (EIFS) with drainage. EIFS with drainage shall comply with ASTM E 2568 and shall have an average minimum drainage efficiency of 90% when tested in accordance with ASTM E 2273.

R703.9.2.2 Installation. The water-resistive barrier shall be applied between the EIFS and the wall sheathing over all building components.

(Portions of proposal not shown remain unchanged)

Committee Reason: This change adds a product into the code that has been used many years and has been improved substantially. Also, this establishes the criteria for use by the Building Official for evaluation and installation. The modification adds criteria for drainage efficiency and clarifies the intent.

Assembly Action: **None**

Final Hearing Results

FS175-07/08, Part I	AM
FS175-07/08, Part II	AM

Code Change No: FS177-07/08

Original Proposal

Sections: 1403.2, 1405.3 (New), 1405.3.1 (New), Table 1405.3.1 (New), 1405.3.2 (New), 1405.3.3 (New); IECC 402.5, 502.5; IRC N1102.5

Proponent: Joseph Lstiburek, Building Science Consulting

THESE PROPOSALS ARE ON THE AGENDA OF THE IBC FIRE SAFETY, THE IECC AND THE IRC BUILDING/ENERGY CODE DEVELOPMENT COMMITTEES AS 3 SEPARATE CODE CHANGES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IBC FIRE SAFETY

1. Revise as follows:

1403.2 Weather protection. Exterior walls shall provide the building with a weather-resistant exterior wall envelope. The exterior wall envelope shall include flashing, as described in Section 1405.3. The exterior wall envelope shall be designed and constructed in such a manner as to prevent the accumulation of water within the wall assembly by providing a water-resistive barrier behind the exterior veneer, as described in Section 1404.2, and a means for draining water that enters the assembly to the exterior. Protection against condensation in the exterior wall assembly shall be provided in accordance with ~~the International Energy Conservation Code~~ Section 1405.3.

Exceptions:

1. A weather-resistant exterior wall envelope shall not be required over concrete or masonry walls designed in accordance with Chapters 19 and 21, respectively.

2. Compliance with the requirements for a means of drainage, and the requirements of Sections 1404.2 and 1405.3, shall not be required for an exterior wall envelope that has been demonstrated through testing to resist wind-driven rain, including joints, penetrations and intersections with dissimilar materials, in accordance with ASTM E 331 under the following conditions:
 - 2.1. Exterior wall envelope test assemblies shall include at least one opening, one control joint, one wall/eave interface and one wall sill. All tested openings and penetrations shall be representative of the intended end-use configuration.
 - 2.2. Exterior wall envelope test assemblies shall be at least 4 feet by 8 feet (1219 mm by 2438 mm) in size.
 - 2.3. Exterior wall envelope assemblies shall be tested at a minimum differential pressure of 6.24 pounds per square foot (psf) (0.297 kN/m²).
 - 2.4. Exterior wall envelope assemblies shall be subjected to a minimum test exposure duration of 2 hours.

The exterior wall envelope design shall be considered to resist wind-driven rain where the results of testing indicate that water did not penetrate control joints in the exterior wall envelope, joints at the perimeter of openings or intersections of terminations with dissimilar materials.

2. Add new text as follows:

1405.3 Vapor retarders. Class I or II vapor retarders shall be provided on the interior side of frame walls in Zones 5, 6, 7, 8 and Marine 4.

Exceptions:

1. Basement walls.
2. Below grade portion of any wall.
3. Construction where moisture or its freezing will not damage the materials.

1405.3.1 Class III vapor retarders. Class III vapor retarders shall be permitted where any one of the conditions in Table 402.5.1 are met.

**TABLE 1405.3.1
CLASS III VAPOR RETARDERS**

ZONE	CLASS III VAPOR RETARDERS PERMITTED FOR:¹
<u>Marine 4</u>	<u>Vented cladding over OSB</u> <u>Vented cladding over Plywood</u> <u>Vented cladding over Fiberboard</u> <u>Vented cladding over Gypsum</u> <u>Insulated sheathing with R-value ≥ R2.5 over 2x4 wall</u> <u>Insulated sheathing with R-value ≥ R3.75 over 2x6 wall</u>
<u>5</u>	<u>Vented cladding over OSB</u> <u>Vented cladding over Plywood</u> <u>Vented cladding over Fiberboard</u> <u>Vented cladding over Gypsum</u> <u>Insulated sheathing with R-value ≥ R5 over 2x4 wall</u> <u>Insulated sheathing with R-value ≥ R7.5 over 2x6 wall</u>
<u>6</u>	<u>Vented cladding over Fiberboard</u> <u>Vented cladding over Gypsum</u> <u>Insulated sheathing with R-value ≥ R7.5 over 2x4 wall</u> <u>Insulated sheathing with R-value ≥ R11.25 over 2x6 wall</u>
<u>7 and 8</u>	<u>Insulated sheathing with R-value ≥ R10 over 2x4 wall</u> <u>Insulated sheathing with R-value ≥ R15 over 2x6 wall</u>

1. Spray foam with a minimum density of 2 lbs/ft³ applied to the interior cavity side of OSB, plywood, fiberboard, or gypsum is deemed to meet the insulating sheathing requirement where the spray foam R-value meets or exceeds the specified insulating sheathing R-value.

1405.3.2 Material vapor retarder class. The vapor retarder class shall be based on the manufacturer's certified testing or a tested assembly.

The following shall be deemed to meet the class specified:

- Class I: Sheet polyethylene, non-perforated aluminum foil
- Class II: Kraft faced fiberglass batts or paint with a perm rating greater than 0.1 and less than or equal to 1.0
- Class III: Latex or enamel paint

1405.3.3 Minimum clear air spaces and vented openings for vented cladding. For the purposes of this section vented cladding shall include the following minimum clear air spaces.

1. Vinyl lap or horizontal aluminum siding applied over a weather resistive barrier as specified in this Chapter.
2. Brick veneer with a clear airspace as specified in this code.
3. Other approved vented claddings.

PART II – IECC

Delete without substitution as follows:

402.5 (Supp) Vapor retarders. Class I or II vapor retarders are required on the interior side of frame walls in Zones 5, 6, 7, 8 and Marine 4.

Exceptions:

1. ~~Basement walls.~~
2. ~~Below grade portion of any wall.~~
3. ~~Construction where moisture or its freezing will not damage the materials.~~

502.5 (Supp) Vapor retarders. Class I or II vapor retarders are required on the interior side of frame walls in Zones 5, 6, 7, 8 and Marine 4.

Exceptions:

1. ~~Basement walls.~~
2. ~~Below grade portion of any wall.~~
3. ~~Construction where moisture or its freezing will not damage the materials.~~

PART III – IRC BUILDING/ENERGY

Revise as follows:

N1102.5 (Supp) R602.1 Vapor retarders. Class I or II vapor retarders are required on the interior side of frame walls in Zones 5, 6, 7, 8 and Marine 4

Exceptions:

1. Basement walls.
2. Below grade portion of any wall.
3. Construction where moisture or its freezing will not damage the materials.

N1102.5.1 (Supp) R602.1.1 Class III vapor retarders. Class III vapor retarders shall be permitted where any one of the conditions in ~~Table N1102.5.1~~ R602.1.1 are met.

**TABLE N1102.5.1 R602.1.1 (Supp)
CLASS III VAPOR RETARDERS**

ZONE	CLASS III VAPOR RETARDERS PERMITTED FOR: ¹
Marine 4	Vented cladding over OSB Vented cladding over plywood Vented cladding over fiberboard Vented cladding over gypsum Insulated sheathing with R -value ≥ 2.5 over 2x4 wall Insulated sheathing with R -value ≥ 3.75 over 2x6 wall
5	Vented cladding over OSB Vented cladding over plywood Vented cladding over fiberboard Vented cladding over gypsum Insulated sheathing with R -value ≥ 5 over 2x4 wall Insulated sheathing with R -value ≥ 7.5 over 2x6 wall
6	Vented cladding over fiberboard Vented cladding over gypsum Insulated sheathing with R -value ≥ 7.5 over 2x4 wall Insulated sheathing with R -value ≥ 11.25 over 2x6 wall
7 and 8	Insulated sheathing with R -value ≥ 10 over 2x4 wall Insulated sheathing with R -value ≥ 15 over 2x6 wall

1. Spray foam with a minimum density of 2 lbs/ft³ applied to the interior cavity side of OSB, plywood, fiberboard, or gypsum is deemed to meet the insulating sheathing requirement where the spray foam R-value meets or exceeds the specified insulating sheathing R-value.

N1102.5.2 (Supp) R602.1.2 Material vapor retarder class. The vapor retarder class shall be based on the manufacturer’s certified testing or a tested assembly.

The following shall be deemed to meet the class specified:

- Class I: Sheet polyethylene, non-perforated aluminum foil
- Class II: Kraft faced fiberglass batts
- Class III: Latex or enamel paint

N1102.5.3 (Supp) R602.1.3 Minimum clear air spaces and vented openings for vented cladding. For the purposes of this section, vented cladding shall include the following minimum clear air spaces. Other openings with the equivalent vent area shall be permitted.

1. Vinyl lap or horizontal aluminum siding applied over a weather resistive barrier as specified in Table R703.4.
2. Brick veneer with a clear airspace as specified in Section R703.7.4.2.
3. Other approved vented claddings.

(Renumber subsequent sections)

Reason: In the last code cycle, the vapor retarder requirements in the IECC, IRC, and IBC were entirely revised. This change does not alter those requirements.

This change moves the new vapor retarder requirements into their proper location. The vapor retarder requirements are not “energy” requirements. The vapor retarder requirements are more logically related to the building code as a whole; therefore, those requirements are moved from the IECC into the IRC and IBC. Most of the resulting language in the IBC and IRC is intentionally identical. Because the I-codes inherit definitions from each other, the definition of vapor retarders can be used in any of the I-codes.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

**PART I – IBC FIRE SAFETY
Committee Action:**

Approved as Modified

Modify the proposal as follows:

**TABLE 1405.3.1
CLASS III VAPOR RETARDERS**

ZONE	CLASS III VAPOR RETARDERS PERMITTED FOR:¹
Marine 4	Vented cladding over OSB Vented cladding over Plywood Vented cladding over Fiberboard Vented cladding over Gypsum Insulated sheathing with R-value \geq R2.5 over 2x4 wall Insulated sheathing with R-value \geq R3.75 over 2x6 wall
5	Vented cladding over OSB Vented cladding over Plywood Vented cladding over Fiberboard Vented cladding over Gypsum Insulated sheathing with R-value \geq R5 over 2x4 wall Insulated sheathing with R-value \geq R7.5 over 2x6 wall
6	Vented cladding over Fiberboard Vented cladding over Gypsum Insulated sheathing with R-value \geq R7.5 over 2x4 wall Insulated sheathing with R-value \geq R11.25 over 2x6 wall
7 and 8	Insulated sheathing with R-value \geq R10 over 2x4 wall Insulated sheathing with R-value \geq R15 over 2x6 wall

1. Spray foam with a minimum density of 2 lbs/ft³ applied to the interior cavity side of OSB, plywood, fiberboard, insulating sheathing or gypsum is deemed to meet the insulating sheathing requirement where the spray foam R-value meets or exceeds the specified insulating sheathing R-value.

Committee Reason: The committee agreed that this change appropriates locates the technical requirements for vapor retarders in the Chapter 14 of the Building Code from the *International Energy Code* because this construction component is a building issue not an energy issue. The modification appropriately adds insulating sheathing to footnote 1 to be consistent with the entries in the Table.

Assembly Action:

None

PART II – IECC

Committee Action:

Approved as Submitted

Committee Reason: Committee agrees with proponent that these requirements for vapor retarders are not energy code issues.

Assembly Action:

None

PART III – IRC B/E

Committee Action:

Approved as Modified

Modify proposal as follows:

**TABLE R602.1.1
CLASS III VAPOR RETARDERS**

ZONE	CLASS III VAPOR RETARDERS PERMITTED FOR:¹
Marine 4	Vented cladding over OSB Vented cladding over plywood Vented cladding over fiberboard Vented cladding over gypsum Insulated sheathing with R-value \geq 2.5 over 2x4 wall Insulated sheathing with R-value \geq 3.75 over 2x6 wall
5	Vented cladding over OSB Vented cladding over plywood Vented cladding over fiberboard Vented cladding over gypsum Insulated sheathing with R-value \geq 5 over 2x4 wall Insulated sheathing with R-value \geq 7.5 over 2x6 wall
6	Vented cladding over fiberboard Vented cladding over gypsum Insulated sheathing with R-value \geq 7.5 over 2x4 wall Insulated sheathing with R-value \geq 11.25 over 2x6 wall
7 and 8	Insulated sheathing with R-value \geq 10 over 2x4 wall Insulated sheathing with R-value \geq 15 over 2x6 wall

1. Spray foam with a minimum density of 2 lbs/ft³ applied to the interior cavity side of OSB, plywood, fiberboard, insulating sheathing or gypsum is deemed to meet the insulating sheathing requirement where the spray foam R-value meets or exceeds the specified insulating sheathing R-value.

(Portions of proposal not shown remain unchanged)

Committee Reason: This change moves the vapor retarder requirement into the proper location in the code. The proper location is the wall chapter since vapor retarder requirements are not energy issues. The modification was made to add insulating sheathing to the footnote which was inadvertently omitted.

Assembly Action:

None

Final Hearing Results

FS177-07/08, Part I	AM
FS177-07/08, Part II	AS
FS177-07/08, Part III	AM

Code Change No: FS178-07/08

Original Proposal

Sections: 1405.4, 1406.2.2, 1407.11.1, 1407.11.2

Proponent: Philip Brazil, PE, Reid Middleton, Inc., himself

Revise as follows:

1405.4 (Supp) Wood veneers. Wood veneers on exterior walls of buildings of Type I, II, III and IV construction shall be not less than 1 inch (25 mm) nominal thickness, 0.438-inch (11.1 mm) exterior hardboard siding or 0.375-inch (9.5 mm) exterior-type wood structural panels or particleboard and shall conform to the following:

1. The veneer shall not exceed ~~three stories~~ 40 feet (12.19 m) in height above the grade plane. Where fire retardant-treated wood is used, the height shall not exceed ~~four stories~~ 60 feet (18.29 m) in height above grade.
2. The veneer is attached to or furred from a noncombustible backing that is fire-resistance rated as required by other provisions of this code.
3. Where open or spaced wood veneers (without concealed spaces) are used, they shall not project more than 24 inches (610 mm) from the building wall.

1406.2.2 (Supp) Architectural trim. In buildings of Type I, II, III and IV construction, exterior wall coverings shall be permitted to be constructed of wood where permitted by Section 1405.4 or other equivalent combustible material. Combustible exterior wall coverings, other than fire-retardant-treated wood complying with Section 2303.2 for exterior installation, shall not exceed 10 percent of an exterior wall surface area where the fire separation distance is 5 feet (1524 mm) or less. Combustible architectural trim shall be limited to ~~three stories or~~ 40 feet (12 192 mm) in height above grade plane. Noncombustible materials shall be permitted to be of any height provided the materials are secured to the wall with metal or other approved noncombustible brackets.

Exception: Combustible architectural trim of fire-retardant treated wood shall be permitted up to ~~four stories or~~ 60 feet (18.29 m) in height above grade plane.

1407.11.1 Installations up to 40 feet in height. MCM shall not be installed more than 40 feet (12 190 mm) in height above ~~the grade plane~~ where installed in accordance with Sections 1407.11.1.1 and 1407.11.1.2.

1407.11.2 Installations up to 50 feet in height. MCM shall not be installed more than 50 feet (15 240 mm) in height above ~~the grade plane~~ where installed in accordance with Sections 1407.11.2.1 and 1407.11.2.2.

Reason: Proposal G44-04/05-AM successfully established the distinction between “grade plane” as a measurement of the height and number of stories of a building above the finished ground surface and “grade” as a measurement of the height of a component of the building above the finished ground surface. Grade plane is an imaginary horizontal reference plane representing the weighted average of the finished ground surface adjoining the building at its perimeter. The grade plane of each building is located at a single, unique elevation. Grade, however, is not imaginary but is the actual finished ground surface adjoining the building at its perimeter, which varies in elevation with the ground surface.

This proposal builds on this distinction in four specific code sections by changing the thresholds for components of buildings (i.e., veneer, architectural trim and exterior wall coverings) from being based on grade plane to being based on grade. This will bring better consistency among the provisions of the IBC whose limitations are based on their heights above the finished ground surface. A comprehensive review of the 2006 IBC and 2007 Supplement was made during the preparation of this proposal and it was determined that code sections with height limits on building components are based on measuring from grade except for the ones in this proposal. Examples of these in Chapters 1-10 are Sections 105.2 (Building Item 6), 418.4, 507.6 (Item 3), 602.4.3, 603.1 (Item 6), 903.2.10.1 (Item 1), 905.4 (Item 1), 1009.3.2 (Paragraph 2), 1013.1, 1013.4, 1013.5, 1019.1, 1022.2 (Exception), 1024.1, 1025.14.1, 1025.14.2, 1025.14.3 and 1026.2 (Exception).

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Errata: FS178-07/08: Replace Section 1406.2.2 with the following:

1406.2.2 (Supp) Architectural trim. In buildings of Type I, II, III and IV construction, exterior wall coverings shall be permitted to be constructed of wood where permitted by Section 1405.4 or other equivalent combustible material. Combustible exterior wall coverings, other than fire-retardant-treated wood complying with Section 2303.2 for exterior installation, shall not exceed 10 percent of an exterior wall surface area where the fire separation distance is 5 feet (1524 mm) or less. Combustible architectural trim shall be limited to ~~three stories or~~ 40 feet (12 192 mm) in height above grade plane. Noncombustible materials shall be permitted to be of any height provided the materials are secured to the wall with metal or other approved noncombustible brackets.

Exception: Combustible architectural trim of fire-retardant treated wood shall be permitted up to ~~four stories or~~ 60 feet (18.29 m) in height above grade plane.

Committee Action:

Approved as Submitted

Committee Reason: The committee agreed that based on changes in the thresholds for components of buildings (i.e., veneer, architectural trim and exterior wall coverings) from being based on grade plane to being based on grade, this change is appropriate and will bring consistency among the provisions of the IBC whose limitations are based on their heights above the finished ground surface.

Assembly Action:

None

Final Hearing Results

FS178-07/08

AS

Code Change No: FS181-07/08

Original Proposal

Section: 1405.13

Proponent: Matthew Dobson, Vinyl Siding Institute

Revise as follows:

1405.13 Vinyl siding. Vinyl siding conforming to the requirements of this section and complying with ASTM D 3679 shall be permitted on exterior walls of buildings of ~~Type V construction located~~ in areas where the basic wind speed specified in Chapter 16 does not exceed 100 miles per hour (45 m/s) and the building height is less than or equal to 40 feet (12 192 mm) in Exposure C. Where construction is located in areas where the basic wind speed exceeds 100 miles per hour (45 m/s), or building heights are in excess of 40 feet (12 192 mm), tests or calculations indicating compliance with Chapter 16 shall be submitted. Vinyl siding shall be secured to the building so as to provide weather protection for the exterior walls of the building. Vinyl siding on the exterior wall of building of Type I, II, II and IV construction shall meet the requirements of 1406.

Reason: Section 1406 of the IBC provides clear requirements for combustible claddings used in various types of construction. This change helps to clarify that when vinyl siding is used in construction Types other than Type V, it must meet the requirements of section 1406 just like other combustible exterior wall coverings.

Additionally, the ICC ES Acceptance Criteria for vinyl siding states that "3.4 Ignition Resistance: For recognition under the IBC and BNBC, for construction other than Type V, the siding shall comply with Section 1406.2 of the IBC and Section 1407.2.1 of the BNBC. For SBC compliance, exterior walls shall not exhibit sustained flaming where tested in accordance with NFPA 268."

This clarification reflects the established references from the acceptance criteria.

Additionally supplied is typical product specifications which clearly demonstrates conformance to section 1406 of the IBC.

"Fire Resistance Characteristics:

Average Time of Burning <5 sec. (ASTM D 635) Average Extent of Burning 9.4 mm (ASTM D 635) Flame Spread 20 (ASTM E 84)

Smoke Density 390 (ASTM E 84)

Ignition Properties Self Ignition did not occur. At 797°F sample began to smolder and continued until consumed (ASTM D 1929)

Radiant Panel Test XXXXX Siding met the conditions for allowable use as specified in section 1406 of the International Building Code. (NFPA 268)"

"NFPA 268 Radiant Heat Test/Ignition Resistance of Exterior Walls. Conclusion that the XXX vinyl sidings were tested and met the conditions for allowable use as specified in Section 1406 of the International Standard Building Code.

The requirements that are applicable to Type I, II, III, and IV construction are simply restated in a straightforward manner in a separate sentence. This only clarifies a confusing passage in the current code language and does not modify any current requirements; therefore the cost of construction should not be affected.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Modified

Modify the proposal as follows:

1405.13 Vinyl siding. Vinyl siding conforming to the requirements of this section and complying with ASTM D 3679 shall be permitted on exterior walls of buildings ~~of~~ located in areas where the basic wind speed specified in Chapter 16 does not exceed 100 miles per hour (45 m/s) and the building height is less than or equal to 40 feet (12 192 mm) in Exposure C. Where construction is located in areas where the basic wind speed exceeds 100 miles per hour (45 m/s), or building heights are in excess of 40 feet (12 192 mm), tests or calculations indicating compliance with Chapter 16 shall be submitted. Vinyl siding shall be secured to the building so as to provide weather protection for the exterior walls of the building. ~~Vinyl siding on the exterior wall of building of Type I, II, III and IV construction shall meet the requirements of 1406.~~

Committee Reason: The committee agreed that this change helps to clarify that the requirements of 1405.13 are applicable to vinyl siding regardless of the type of construction. Therefore it is appropriate to delete the limitation of Type V construction. Further, the modification appropriately deletes reference to Section 1406 because Section 1405.13 is dealing strictly with structural limitations, whereas Section 1406 deals with fire resistive requirements.

Assembly Action:

None

Final Hearing Results

FS181-07/08

AM

Code Change No: FS182-07/08

Original Proposal

Sections: 1405.15, 1405.17 through 1405.17.2; IRC R703.10.1, R703.10.2, Table R703.4

Proponent: Chad Diercks, James Hardie Building Products, Inc.

THESE PROPOSALS ARE ON THE AGENDA OF THE IBC FIRE SAFETY AND IRC BUILDING/ENERGY CODE DEVELOPMENT COMMITTEES AS 2 SEPARATE CHANGES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IBC FIRE SAFETY

1. Add new text as follows:

1405.15.1 Panel siding. Fiber-cement panels shall comply with the requirements of ASTM C 1186, Type A, minimum Grade II. Panels shall be installed with the long dimension either parallel or perpendicular to framing. Vertical and horizontal joints shall occur over framing members and shall be sealed with caulking, covered with battens or shall be designed to comply with Section 1403.2. Panel siding shall be installed with fasteners in accordance with the approved manufacturer's instructions.

1405.15.2 Lap siding. Fiber-cement lap siding having a maximum width of 12 inches shall comply with the requirements of ASTM C 1186, Type A, minimum Grade II. Lap siding shall be lapped a minimum of 1¼ inches and lap siding not having tongue-and-groove end joints shall have the ends sealed with caulking, covered with an H-section joint cover, located over a strip of flashing, or shall be designed to comply with Section 1403.2. Lap siding courses shall be installed with the fastener heads exposed or concealed in accordance with the approved manufacturer's instructions.

2. Delete without substitution as follows:

1405.17 Fiber cement siding.

1405.17.1 Panel siding. Panels shall be installed with the long dimension parallel to framing. Vertical joints shall occur over framing members and shall be sealed with caulking or covered with battens. Horizontal joints shall be flashed with Z-flashing and blocked with solid wood framing.

1405.17.2 Horizontal lap siding. Lap siding shall be lapped a minimum of 1¼ inches (32 mm) and shall have the ends sealed with caulking, covered with an H-section joint cover or located over a strip of flashing. Lap siding courses shall be permitted to be installed with the fastener heads exposed or concealed, according to approved manufacturers' instructions.

PART II – IRC BUILDING/ENERGY

Revise as follows:

**TABLE R703.4
WEATHER-RESISTANT SIDING ATTACHMENT AND MINIMUM THICKNESS**

SIDING MATERIAL	NOMINAL THICKNESS ^a (inches)	JOINT TREATMENT	WATER RESISTIVE BARRIER REQUIRED	TYPE OF SUPPORTS FOR THE SIDING MATERIAL AND FASTENERS ^{b,c,d}					
				Wood or wood structural panel sheathing	Fiber board sheathing into stud	Gypsum sheathing into stud	Foam plastic sheathing into stud	Direct to studs	Number or spacing of fasteners
Fiber cement panel siding ^{fs}	5/16	Note s	Yes Note x	6d <u>common</u> corrosion resistant nail ^t	6d <u>common</u> corrosion resistant nail ^t	6d <u>common</u> corrosion resistant nail ^t	6d <u>common</u> corrosion resistant nail ^{t,y}	4d <u>common</u> corrosion resistant nail ^{ut}	6" oc on edges, 12" oc on intermed. studs
Fiber cement lap siding ^{fv}	5/16	Note v	Yes Note x	6d <u>common</u> corrosion resistant nail ^t	6d <u>common</u> corrosion resistant nail ^t	6d <u>common</u> corrosion resistant nail ^t	6d <u>common</u> corrosion resistant nail ^{t,y}	6d <u>common</u> corrosion resistant nail ^t OR 11 gage roofing nail ^t	Note w

f. Fiber cement siding shall comply with the requirements of ASTM C 1186.

t. Minimum 0.102 inch smooth shank, 0.255 inch round head. Fasteners shall comply with the nominal dimensions in ASTM F1667

u. Minimum 0.099 smooth shank, 0.250 round head.

w. Face nailing: 2 nails one 6d common nail through the overlapping planks at each stud. Concealed nailing: one 11 gage 11/2 inch long galv. roofing nail (0.371 head diameter, 0.120 shank) or 6d galv. box nail at each stud: through the top edge of each plank at each stud.

(Portions of table and footnotes not shown remain unchanged)

R703.10.1 Panel siding. Fiber-cement panels shall comply with the requirements of ASTM C 1186, Type A, minimum Grade II. Panels shall be installed with the long dimension either parallel or perpendicular to framing. Vertical and horizontal joints shall occur over framing members and shall be sealed with caulking, or covered with battens, or shall be designed to comply with Section R703.1. Horizontal joints shall be flashed with Z-flashing and blocked with solid wood framing. Panel siding shall be installed with fasteners according to Table R703.4 or approved manufacturer's installation instructions.

R703.10.2 Horizontal Lap siding. Fiber-cement lap siding having a maximum width of 12 inches shall comply with the requirements of ASTM C 1186, Type A, minimum Grade II. Lap siding shall be lapped a minimum of 1¼ inches (32 mm) and lap siding not having tongue-and-groove end joints shall have the ends sealed with caulking, covered installed with an H-section joint cover, or located over a strip of flashing, or shall be designed to comply with Section R703.1. Lap siding courses may be installed with the fastener heads exposed or concealed, according to Table R703.4 or approved manufacturers' installation instructions.

CODE CHANGES RESOURCE COLLECTION – INTERNATIONAL BUILDING CODE

Reason: (IBC) The purpose of this proposed Code change is to clarify and correct errors and omissions in the current language describing the recognized products and recognized methods of installation.

Revision of Section 1405.15, addition of new text 1405.15.1, and deletion of Section 1405.17 and 1405.17.1

The current Code language fails to specify the product “classification type”; either “Type A – Sheets are intended for exterior applications, subject to the direct action of sun, rain or snow” or “Type B – Sheets are intended for exterior application, not subjected to the direct action of sun, rain, or snow” (see ASTM C1186, Sections 4.1 and 4.2). The current Code language fails to specify a minimum “product grade” according to flexural strength either Grade I, II, III or IV (see ASTM C1186 Section 4.4 and Table 1). Additionally, panels are often installed horizontally under windows and as infill panels over windows, doors and in gables where all edges of the panels are supported by framing members. Lastly, the reference to Section 1403.2 Weather Protection is clarifying and is needed to address alternate joint designs currently being used in the field. This would require water penetration testing of these alternative joint designs to ASTM E 331 thereby substantiating the alternate design.

Consequently, Type A sheets suitable for full exterior exposure applications must be specified and the minimum flexural strength specified should be Grade II. Attachment in accordance with should also be clearly stated. Additionally, sheets should be permitted for horizontal application. Finally, jointing shall be in such a manner to comply with Section 1403.2.

Revision of Section 1405.15, addition of new text 1405.15.2, and deletion of Section 1405.17 and 1405.17.2

The current Code language fails to specify a maximum product width. A maximum plank width of 12 inches is proposed and is consistent with the current market offerings for lap siding.

The current Code language fails to specify the product “classification type”; either “Type A – Sheets are intended for exterior applications, subject to the direct action of sun, rain or snow” or “Type B – Sheets are intended for exterior application, not subjected to the direct action of sun, rain, or snow” (see ASTM C1186, Sections 4.1 and 4.2).

The current Code language fails to specify a minimum “product grade” according to flexural strength either Grade I, II, III or IV (see ASTM C1186 Section 4.4 and Table 1).

Consequently, the maximum width of plank is specified at 12 inches. Type A sheets (lap siding) suitable for full exterior exposure applications must be specified and the minimum flexural strength specified should be Grade II.

Additionally, besides being installed horizontally, lap siding is often installed diagonally or vertically in a “board-and-batten” type application. The reference to “horizontal” should be removed.

Lastly, the reference to Section 1403.2 Weather Protection is clarifying and is needed to address alternate joint designs currently being used in the field. This would require water penetration testing of these alternative joint designs to ASTM E 331 thereby substantiating the alternate design.

ICC-ES Acceptance Criteria (AC-90), Section 3.1 supports the proposal for “Type A” sheets (see also evaluation reports for Certaineed Corporation ESR-1668, Section 6.1; James Hardie Building Products NER-405, Section 3.1; and Mexalit Industrial ER-5139, Section 3). The sheet types, according to their intended application, are classified in Section 4.1 of ASTM C1186. The current Industry Standard for flexural strength (bending strength) of exterior flat sheets and planks is Grade II and is verified in a manufacturer’s product declaration (see Mexalit Industrial flexural strength technical data sheet page 2, “Bending Strengths”) and a manufacturer’s evaluation report (see James Hardie Building Products NER-405, Section 3.1, paragraph 3). Section 6.2.1 and Table 1 of ASTM C1186 corroborates this assertion.

Panel siding is currently recognized for installation either vertically or horizontally when the panel edges are supported by framing. (see evaluation report for James Hardie Building Products NER-405, Table 3, footnote 1). Horizontal panel installation should not be prohibited when the panel edges are supported by framing. From an engineering standpoint, as long as the panels are fastened to framing at all supported edges and at intermediate framing members in accordance with the approved manufacturer’s instructions, attributed wind loads and structural loads are not compromised.

The current Industry Standard for fiber-cement planks is a maximum of 12 inches wide (see evaluation reports for Certaineed Corporation ESR 1668, Table 1; James Hardie Building Products NER-405, Table 1; and Mexalit Industrial ER-5139, Table 1).

Fiber-cement lap siding may be installed vertically, diagonally as well as horizontally. As long as the minimum 1¼ inch lap is maintained and the lap siding courses are installed with the fastener heads exposed or concealed, according to the approved manufacturer’s instructions, the system structural performance is not compromised.

Flashing within the context of IBC Section 1405, “Installation Of Wall Coverings”, is currently described in Section 1405.3. Consequently, prescriptive flashing details that may be contraindicated by the architectural design should not be included in this section.

Designing joints within the context of IBC Section 1403.2, “Weather Protection”, is currently described in Section 1403.2. This section allows for alternate designs via compliance testing to ASTM E 331. As a consequence, joint designs complying with ASTM E 331 would substantiate the exceptions under Section 1403.2 thereby allowing for a code compliant installation.

Bibliography:

ICC-ES (AC90) Acceptance Criteria for Fiber Cement Siding used as Exterior Wall Siding.

Certaineed Corporation ES Report ESR-1668

James Hardie Building Products Legacy Report NER-405

Mexalit Industrial Legacy Report ER-5139

North Pacific (MaxiPanel® & MaxiPlank®) Cement Fiber Siding Technical Data

ASTM C1186-02, Standard Specification for Flat Non-Asbestos Fiber-Cement Sheets

ASTM E331-00, Test Method for Water Penetration of Exterior Windows, Skylights, Doors and Curtain Walls by Uniform Static Air Pressure Difference

(IRC) The purpose of this proposed Code change is to clarify and correct errors and omissions in the current language describing the recognized product and recognized methods of installation.

Revision of Section 703.10.1

The current Code language fails to specify the product “classification type”; either “Type A – Sheets are intended for exterior applications, subject to the direct action of sun, rain or snow” or “Type B – Sheets are intended for exterior application, not subjected to the direct action of sun, rain, or snow.” (see ASTM C1186-02, Sections 4.2 and 4.2). The current Code language fails to specify a minimum “product grade” according to flexural strength as either Grade I, II, III or IV (see ASTM C1186-02, Section 4.4 and Table 1). The current Code language is unclear concerning the fastening requirements for compliance with either the minimum prescriptive performance requirements as described in Section R703.2 (Table R703.4), or alternative approved fastening requirements complying with the attachment requirements of Tables R301.2(2) and R301.2(3). Additionally, panels are often installed horizontally under windows and as infill panels over windows, doors and in gables where all edges of the panels are supported by framing members. Lastly, the reference to Section R703.1 “General” Exterior Covering is clarifying and is needed to address alternate joint designs currently being used in the field. This would require water penetration testing of these alternative joint designs to ASTM E 331 thereby substantiating the alternate design.

Consequently, Type A sheets suitable for full exterior exposure applications must be specified and the minimum flexural strength specified should be Grade II. Attachment in accordance with the minimum prescriptive requirements of Table R703.4 or alternative “performance-based” attachment should also be clearly stated. Additionally, sheets should be permitted for horizontal application. Flashing is described in R703.8 and can therefore be omitted in this section. Finally, jointing shall be in such a manner to comply with Section R703.1

Revision of Section R703.10.2

The current Code language fails to specify a maximum product width. Conceivably, lap siding having a width of 24 inches could be installed in accordance with Table R703.4 with an expectation of a specified level of wind resistance. I believe that all current published engineering (manufacturer's instructions and evaluation reports) on this documents a maximum plank width of 12 inches to perform to the tabled requirements.

The current Code language fails to specify the product "classification type"; either "Type A – Sheets are intended for exterior applications, subject to the direct action of sun, rain or snow" or "Type B – Sheets are intended for exterior application, not subjected to the direct action of sun, rain, or snow" (see ASTM C1186-02, Sections 4.2 and 4.2).

The current Code language fails to specify a minimum "product grade" according to flexural strength, either Grade I, II, III or IV (see ASTM C1186-02, Section 4.4 and Table 1).

The current Code language is unclear concerning the fastening requirements for compliance with either the minimum prescriptive performance requirements as described in Section R703.2 (Table R703.4), or alternative approved fastening requirements complying with the attachment requirements of Tables R301.2(2) and R301.2(3).

Lastly, the reference to Section R703.1 "General" Exterior Covering is clarifying and is needed to address alternate joint designs currently being used in the field. This would require water penetration testing of these alternative joint designs to ASTM E 331 thereby substantiating the alternate design.

Consequently, the maximum width of plank is specified at 12 inches. Type A sheets (lap siding) suitable for full exterior exposure applications must be specified and the minimum flexural strength specified should be Grade II. Attachment in accordance with the minimum prescriptive requirements of Table R703.4 or alternative "performance-based" attachment should also be clearly stated. Additionally, besides being installed horizontally, lap siding is often installed diagonally or vertically in a "board-and-batten" type application. Finally, jointing shall be in such a manner to comply with Section R703.1

Deletion of footnote "r" in Table R703.4

Fiber-cement is not correctly described in the existing footnote "r". Recommended revisions to Sections R703.10.2 and R703.10.2 fully accommodate the description of Fiber-Cement Exterior Cladding.

Revision to footnote "t" of Table R703.4

The current tabled fasteners for the attachment of fiber-cement are "6d corrosion resistant nail (superscript - t)" or "4d corrosion resistant nail (superscript u)". Neither of the minimum fastener dimensions in footnotes "t" and "u" conforms to nominal dimensions in the National Standard (ASTM F 1667) for either "common" or "box" nails. The fasteners referenced in the table and footnotes should comply with the dimensions in the current National Standard.

"ASTM F 1667, Table 6 (Type I, Style 4A – Box Nails"

4d = nominal 1½ inch long, 0.080 inch shank, 0.219 inch head diameter

6d = nominal 2 inch long, 0.099 inch shank diameter, 0.266 inch head diameter

"ASTM F 1667, Table 15 "Type I, Style 10 – Common Nails"

4d = nominal 1½ inch long, 0.099 inch shank, 0.250 inch head diameter

6d = nominal 2 inch long, 0.113 inch shank diameter, 0.266 inch head diameter

Tolerances (ASTM F 1667, Section 8.2) on nominal dimensions for nails and spikes are:

± 1/16 inch for lengths over 1 inch, up to and including 2½ inches;

± 0.004 inch for shank diameters of 0.076 inch and larger;

+0, -10% for head diameter for roofing nails; and

± 10% for head diameters of other brand, nails, and spikes.

Delete footnote "u" of Table R703.4 without substitution

Footnote "t" has been revised to specify fasteners complying with nominal dimensions in ASTM F1667. Information contained in footnote "u" is no longer necessary.

Revision to footnote "w" of Table R703.4

The current Code language is contradictory in the description of fasteners for face nailing and concealed nailing in order to comply with the prescriptive performance requirements as described in Section R703.4 "Attachments" (<110 miles per hour, Category C at 33 feet above ground). It is inconsistent to permit 6d galv. box nails (nominal head diameter of 0.266 inch) to be used for concealed nailing in the same section that specifies 11 gage, 1-1/2 inch long roofing nails (nominal head diameter of 0.371 inch) for concealed fastening. Current manufacturer compliance reports do not recognize the use of fasteners having a nominal head diameter of 0.267 inch for concealed fastening. Current manufacturer compliance reports do recognize the use of roofing nails having a nominal head diameter of 0.371 inch for concealed fastening for the design loads described in Section R703.4.

ICC-ES Acceptance Criteria (AC-90), Section 3.1 supports the proposal for "Type A" sheets (See also evaluation reports for James Hardie Building Products NER-405, Section 3.1; Mexalit Industrial ER-5139, Section 3; and Certaineed Corporation ESR-1668, Section 6.1. The current Industry standard for flexural strength (bending strength) of exterior flat sheets is Grade II and is verified in manufacturer's product declarations (see Mexalit Technical Data Sheet) or evaluation report (see James Hardie Building Products NER-405, Section 3.1).

Designing joints within the context of IRC Section R703.1, "General" Exterior Covering, is currently described in Section R703.1. This section allows for alternate designs via compliance testing to ASTM E 331. As a consequence, joint designs complying with ASTM E 331 would substantiate the exceptions under Section R703.1 thereby allowing for a code compliant installation.

Bibliography:

ASTM C1186-02, Standard Specification for Flat Non-Asbestos Fiber-Cement Sheets.

ASTM E331-00, Test Method for Water Penetration of Exterior Windows, Skylights, Doors and Curtain Walls by Uniform Static Air Pressure Difference

ASTM F1667-03, Specification for Driven Fasteners, Nails, Spikes, and Staples.

ICC-ES (AC90) Acceptance Criteria for Fiber Cement Siding used as Exterior Wall Siding.

Certaineed Corporation ES Report ESR-1668

James Hardie Building Products Legacy Report NER-405

Mexalit Industrial Legacy Report ER-5139

North Pacific (MaxiPanel® & MaxiPlank®) Cement Fiber Siding Technical Data

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

PART I – IBC FIRE SAFETY

Committee Action:

Approved as Submitted

Committee Reason: The committee indicated that expanding the technical definitions of panel siding and lap siding was appropriate because they provide for more understandable definitions.

Assembly Action:

None

PART II – IRC B/E
Committee Action:

Approved as Submitted

Committee Reason: This change corrects errors and provides additional flashing and fastening options for fiber-cement siding.

Assembly Action:

None

Final Hearing Results

FS182-07/08, Part I AS
FS182-07/08, Part II AS

Code Change No: FS183-07/08

Original Proposal

Section: 1406.2.2

Proponent: Andy Williams, Alcan Composites USA, Inc.

Revise as follows:

1406.2.2 (Supp) Architectural trim Type I, II, III, and IV construction. ~~On buildings of Type I, II, III and IV construction, exterior wall coverings shall be permitted to be constructed of wood where permitted by in accordance with Section 1405.4, or other equivalent combustible material, complying with the following limitations:~~

- ~~1. Combustible exterior wall coverings, other than fire-retardant treated wood complying with Section 2303.2 for exterior installation, shall not exceed 10 percent of an exterior wall surface area where the fire separation distance is 5 feet (1524 mm) or less.~~
- ~~2. Combustible architectural trim shall be limited to three stories or 40 feet (12 192 mm) in height above grade plane. Noncombustible materials shall be permitted to be of any height provided the materials are secured to the wall with metal or other approved noncombustible brackets.~~

Exception: ~~Combustible architectural trim exterior wall coverings constructed of fire-retardant treated wood complying with Section 2303.2 for exterior installation shall not be limited in wall surface area where the fire separation distance is 5 feet (1524 mm) or less and shall be permitted up to four stories or 60 feet in height above grade plane regardless of the fire separation distance.~~

Reason: The purpose of this code change proposal is to further clarify this section which was revised during the last code development cycle. In our opinion this does not change the technical provisions. We believe these revisions will make this section more user friendly as well. It has been reformatted so that the two conditions where combustible exterior wall coverings and/or trim are allowed are clearly delineated. The title is modified to assist the user to understand that its intent is to apply to those types of construction that have noncombustible exterior walls. This section also deals with more than architectural trim as it contains criteria for exterior wall coverings which include architectural trim. The exception has then been combined to apply to the entire section for fire-retardant-treated wood. And, finally, the sentence allowing noncombustible materials of any height has been deleted. It is unnecessary since this section is only dealing with the allowable use of combustible exterior wall coverings and trim on buildings required to have noncombustible exterior walls.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Modified

Modify the proposal as follows:

1406.2.2 (Supp) Type I, II, III, and IV construction. On buildings of Type I, II, III and IV construction, exterior wall coverings shall be permitted to be constructed of wood in accordance with Section 1405.4, or other equivalent combustible material, complying with the following limitations:

1. Combustible exterior wall coverings, shall not exceed 10 percent of an exterior wall surface area where the fire separation distance is 5 feet (1524 mm) or less.
2. Combustible architectural trim shall be limited to three stories or 40 feet (12 192 mm) in height above grade plane.
3. ~~Exception:~~ Combustible exterior wall coverings constructed of fire-retardant treated wood complying with Section 2303.2 for exterior installation shall not be limited in wall surface area where the fire separation distance is 5 feet (1524 mm) or less and shall be permitted up to four stories or 60 feet in height above grade plane regardless of the fire separation distance.

Committee Reason: The committee agreed that the reorganization of Section 1406.2.2 was more understandable and did not change the technical requirements. The modification clarified that the language in the exception was not really an exception and could simply be identified as another item in the list (#3).

Assembly Action:

None

Final Hearing Results

FS183-07/08

AM

Code Change No: FS185-07/08

Original Proposal

Section: 1407.8

Proponent: Andy Williams, Alcan Composites USA, Inc.

Revise as follows:

1407.8 Fire-resistance rating. Where MCM systems are used on exterior walls required to have a fire-resistance rating in accordance with Section 704, evidence shall be submitted to the building official that the required fire-resistance rating is maintained.

Exception: MCM systems not containing foam plastic insulation, which are installed on the outer surface of a fire-resistance rated exterior wall in a manner such that the attachments do not penetrate through the entire exterior wall assembly, shall not be required to comply with this section.

Reason: A new exception is being proposed to this section which currently requires that sufficient evidence be submitted to the building official to indicate that the required fire-resistance rating of the exterior wall to which the MCM system is applied is not adversely affected by the installation of the MCM system. The proposed exception is intended to address those situations where the MCM system does not contain foam plastic insulation and is installed onto the outer surface of the fire-resistance rated exterior wall so that the attachments to the wall do not penetrate through the entire wall assembly to the interior face where the attachments could be exposed to a fire condition inside the building.

We have proposed to exclude systems containing foam plastic insulation on the exterior face of exterior walls since they pose unique conditions that definitely require an engineering analysis or additional fire testing to verify that such an installation would not unduly impair the required fire-resistance rating of the exterior wall. However, for the typical MCM system wherein the MCM panel is "thermally thin", and contains minimal combustible mass, there should be no significant impact on the fire-resistance rating of the exterior wall, especially if the fire-resistance is required to be determined from the exterior side. For the interior side, there will be adequate heat dissipation on the unexposed surface, which in this case would be the exterior surface of the wall on which the MCM system is installed, since the MCM system has no significant insulation qualities. Thus, the main concern is that there are no through connections made when the system is attached to the exterior wall such that there would be a direct path for heat from an interior fire to penetrate the wall and pass through to the exterior surface.

In our opinion, attaching an MCM system to a fire-resistance rated exterior wall is not significantly different than attaching an interior finish wall panel to a fire-resistance rated interior wall such as the interior face of an exterior bearing wall, for example. Traditionally, there's been no need to provide additional evaluation of such installations to determine if the fire-resistance rating of the interior wall is maintained or otherwise not adversely impacted by the installation of the interior finish material. Therefore, we believe that this exception is a reasonable approach to allowing certain types of MCM systems to be installed on fire-resistance rated exterior walls without requiring an engineering evaluation or additional fire testing to verify that the fire-resistance rating is not adversely affected by such installation.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The committee agreed that this exception is technically feasible and provides a reasonable option to allow certain applications of metal composite material on fire-resistance rated exterior walls without having to justify to the code official that the rating is maintained.

Assembly Action:

None

Final Hearing Results

FS185-07/08

AS

Code Change No: **FS186-07/08**

Original Proposal

Section: 1407.9

Proponent: Robert McCluer, RMc Code Consulting, representing Metal Construction Association

Revise as follows:

1407.9 (Supp) Surface-burning characteristics. Unless otherwise specified, MCM shall have a flame spread index of 75 or less and a smoke-developed index of 450 or less when tested ~~as an assembly~~ in the maximum thickness intended for use in accordance with ASTM E 84 or UL 723.

Reason: Over the years, there has been a significant amount of confusion about what is the intent of this section regarding what actually needs to be tested. Use of the term "assembly" has led to questions regarding the extent to which attachments, substrate, framing, and the aluminum profiles should be provided for testing in the same manner the MCM panels are installed on a building. This section is only intended to evaluate the surface burning characteristics of the cladding material. Many of the attachment systems are not able to be installed within the space limitations of the ASTM E84 apparatus. Thus the need for clarity in application.

For the purpose of testing the surface burning characteristics of the MCM to determine its acceptability for use on the exterior of buildings required to be constructed of noncombustible materials, it should only be necessary to test the MCM using a typical joinery method or system when the MCM's are installed end to end in the tunnel furnace used in ASTM E84. There is no technical reason to include the framing system, substrates, and structural attachments on the back side of the MCM for an exterior wall application when these framing/attachment elements are not required for wall panels used as interior finish when they are tested to ASTM E84 as required in Chapter 8. Specifically, Section 803.1.1 requires interior wall finish to be tested in accordance with ASTM E84. ASTM E84 specifies that the test specimen sections (panels) be joined or butted end-to-end using mounting methods specified therein or in Appendix X1. This should also be adequate for testing MCM which are intended to be used on exterior walls.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The committee agreed that this section is only intended to evaluate the surface burning characteristics of the MCM cladding material. Many of the attachment systems are not able to be installed within the space limitations of the ASTM E84 apparatus.

Assembly Action:

None

Final Hearing Results

FS186-07/08

AS

Code Change No: FS187-07/08

Original Proposal

Section: 1407.10.4

Proponent: Robert McCluer, RMc Code Consulting, representing Metal Construction Association

Revise as follows:

1407.10.4 Full-scale tests. The MCM ~~exterior wall assembly~~ system shall be tested in accordance with, and comply with, the acceptance criteria of NFPA 285. Such testing shall be performed on the MCM system with the MCM in the maximum thickness intended for use.

Reason: The term “MCM exterior wall assembly” is not a defined term. Interpretation of this term has led to confusion regarding the level of detail reported when an MCM system is tested in accordance with NFPA 285. Changing the term to “MCM system” provides better guidance for the building official of what was tested so that a comparison can be made to what is being proposed for construction. This also makes the terms in this section internally consistent since “MCM system” is used in the second sentence.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The committee agreed that the term “MCM exterior wall assembly” is not a defined term and changing the term to “MCM system” provides better guidance for the building official of what was tested so that an appropriate comparison can be made to what is being proposed for construction.

Assembly Action:

None

Final Hearing Results

FS187-07/08

AS

Code Change No: FS188-07/08

Original Proposal

Section: 1407.13 (New)

Proponent: Robert McCluer, RMc Code Consulting, representing Metal Construction Association

Add new text as follows:

1407.13 Foam plastic insulation. MCM systems containing foam plastic insulation shall also comply with the requirements of Section 2603.

(Renumber subsequent section)

Reason: Although Section 1407.1.1 does not allow the plastic core of MCM to contain foam plastic insulation, the MCM system installed on the exterior wall of a building may indeed contain foam plastic insulation to satisfy the insulation requirements of the Energy Code, for example. In that case, it is critical that the wall system meet the requirements of Section 2603 which address the use of foam plastic insulation in or on exterior

walls. This is even more critical for buildings where the exterior walls are required to be of noncombustible construction which are regulated by Section 2603.5 Exterior Walls of Buildings of Any Height. Thus, this code change proposal simply provides a user friendly cross-reference to Section 2603 to make sure the designer realizes that an MCM system which utilizes foam plastic insulation also needs to comply with Section 2603.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The committee agreed that this proposal appropriately sends the code user to Section 2603 for MCM systems containing foam plastic materials.

Assembly Action:

None

Final Hearing Results

FS188-07/08

AS

Code Change No: FS192-07/08

Original Proposal

Section: 2605.2

Proponent: Marcelo M. Hirschler, GBH International, representing American Fire Safety Council

Revise as follows:

2605.1 Interior use. Where used within a building, plastic veneer shall comply with the interior finish requirements of Chapter 8.

2605.2 Exterior use. Exterior plastic veneer, other than plastic siding, shall be permitted to be installed on the exterior walls of buildings of any type of construction in accordance with all of the following requirements:

1. Plastic veneer shall comply with Section 2606.4.
2. Plastic veneer shall not be attached to any exterior wall to a height greater than 50 feet (15 240 mm) above grade.
3. Sections of plastic veneer shall not exceed 300 square feet (27.9 m²) in area and shall be separated by a minimum of 4 feet (1219 mm) vertically.

Exception: The area and separation requirements and the smoke-density limitation are not applicable to plastic veneer applied to buildings constructed of Type VB construction, provided the walls are not required to have a fire-resistance rating.

2605.3 Plastic siding. Plastic siding shall comply with the requirements of Sections 1404 and 1405.

Reason: Plastic siding should meet the requirements of the corresponding standard specifications and not the requirements of light-transmitting plastics shown in 2606.4. This is simply clarification but would prevent confusion.

The definitions of exterior wall covering and of veneer are almost interchangeable. Therefore, it is possible that someone might interpret that vinyl siding (or polypropylene siding) are plastic veneers and can meet the requirements of 2606.4. See as follows:

EXTERIOR WALL COVERING. A material or assembly of materials applied on the exterior side of exterior walls for the purpose of providing a weather-resisting barrier, insulation or for aesthetics, including but not limited to, veneers, siding, exterior insulation and finish systems, architectural trim and embellishments such as cornices, soffits, fascias, gutters and leaders.

VENEER. A facing attached to a wall for the purpose of providing ornamentation, protection or insulation, but not counted as adding strength to the wall.

VINYL SIDING. A shaped material, made principally from rigid polyvinyl chloride (PVC), that is used as an exterior wall covering.

POLYPROPYLENE SIDING. A shaped material, made principally from polypropylene homopolymer, or copolymer, which in some cases may contain fillers and/or reinforcements, that is used to clad exterior walls of buildings.

Cost Impact: This proposal should not affect the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The committee agreed that as a point of clarification the code user should be aware that plastic siding is required to meet the requirements of the corresponding standard specifications and not the requirements of light-transmitting plastics shown in 2606.4; therefore reference to Section 1404 and 1405 for plastic siding is appropriate.

Assembly Action:

None

Final Hearing Results

FS192-07/08

AS

Code Change No: FS194-07/08

Original Proposal

Section: 2606.7

Proponent: Sarah A. Rice, CBO, Schirmer Engineering Corporation

Revise as follows:

2606.7 Light-diffusing systems. Unless the building is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1, light-diffusing systems shall not be installed in the following occupancies and locations:

1. Group A with an occupant load of 1,000 or more.
2. Theaters with a stage and proscenium opening and an occupant load of 700 or more.
3. Group I-2.
4. Group I-3.
5. ~~Exit stairways~~ Vertical exit enclosures and exit passageways.

Reason: Editorial in nature but needed so that ramps, when used as an exit and located in an enclosure are included.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The committee agreed that the change was editorial in nature but was required so that ramps, when used as an exit and located in an enclosure were included as part of the requirements for light-diffusing systems.

Assembly Action:

None

Final Hearing Results

FS194-07/08

AS

Code Change No: **FS196-07/08**

Original Proposal

Sections: 2602, 2612 (New)

Proponent: Jesse J. Beitel, Hughes Associates, Inc., representing American Composites Manufacturers Association

1. Delete without substitution:

**SECTION 2602
DEFINITIONS**

REINFORCED PLASTIC, GLASS FIBER. Plastic reinforced with glass fiber having not less than 20 percent of glass fibers by weight.

2. Add new definitions as follows:

**SECTION 2602
DEFINITIONS**

FIBER REINFORCED POLYMER. A polymeric composite material consisting of reinforcement fibers impregnated with a fiber-binding polymer which is then molded and hardened.

FIBERGLASS REINFORCED POLYMER. A polymeric composite material consisting of glass reinforcement fibers impregnated with a fiber-binding polymer which is then molded and hardened.

3. Add new text as follows:

**SECTION 2612
FIBER REINFORCED POLYMER AND FIBERGLASS REINFORCED POLYMER**

2612.1 General. The provisions of this section shall govern the requirements and uses of fiber reinforced polymer or fiberglass reinforced polymer in and on buildings and structures.

2612.2 Labeling and identification. Packages and containers of fiber reinforced polymer or fiberglass reinforced polymer and their components delivered to the job site shall bear the label of an approved agency showing the manufacturer's name, the product listing, product identification and information sufficient to determine that the end use will comply with the code requirements.

2612.3 Interior finish. Fiber reinforced polymer or fiberglass reinforced polymer used as interior finish shall comply with Chapter 8.

2612.4 Decorative materials and trim. Fiber reinforced polymer or fiberglass reinforced polymer used as decorative materials or trim shall comply with Section 806.

2612.5 Light transmitting materials. Fiber reinforced polymer or fiberglass reinforced polymer used as light transmitting materials shall comply with Sections 2606 through 2611 as required for the specific application.

2612.6 Exterior use. Fiber reinforced polymer or fiberglass reinforced polymer shall be permitted to be installed on the exterior walls of buildings of any type of construction when they meet the requirements of Sections 2603.5 and is fire-blocked in accordance with Section 717. The fiber reinforced polymer or the fiberglass reinforced polymer shall be designed for uniform live loads as required in Table 1607.1 as well as for snow loads, wind loads and earthquake loads as specified in Sections 1608, 1609 and 1613 respectively.

Exceptions:

1. When all of the following conditions are met:
 - 1.1. When the area of the fiber reinforced polymer or the fiberglass reinforced polymer does not exceed 20% of the respective wall area, the fiber reinforced polymer or the fiberglass reinforced polymer shall have a flame-spread index of 25 or less or when the area of the fiber reinforced polymer or the fiberglass reinforced polymer does not exceed 10% of the respective wall area, the fiber reinforced polymer or the fiberglass reinforced polymer shall have a flame-spread index of 75 or less. The flame-spread index requirement shall not be required for coatings or paints having a thickness of less than 0.036 inch (0.9 mm) that are applied directly to the surface of the fiber reinforced polymer or the fiberglass reinforced polymer
 - 1.2. Fireblocking complying with Section 717.2.6 shall be installed.
 - 1.3. The fiber reinforced polymer or the fiberglass reinforced polymer shall be installed directly to a noncombustible substrate or be separated from the exterior wall by one of the following materials: corrosion-resistant steel having a minimum base metal thickness of 0.016 inch (0.41 mm) at any point, Aluminum having a minimum thickness of 0.019 inch (0.5 mm) or other approved noncombustible material.
 - 1.4. The fiber reinforced polymer or the fiberglass reinforced polymer shall be designed for uniform live loads as required in Table 1607.1 as well as for snow loads, wind loads and earthquake loads as specified in Sections 1608, 1609 and 1613 respectively.
2. When installed on buildings that are 40 feet (12,190 mm) or less above grade, the fiber reinforced polymer or the fiberglass reinforced polymer shall meet the requirements of Section 1406.2 and shall comply with all of the following conditions:
 - 2.1. Where the fire separation distance is 5 feet (1524 mm) or less, the area of the fiber reinforced polymer or the fiberglass reinforced polymer shall not exceed 10% of the wall area Where the fire separation distance is greater than 5 feet (1524 mm) there shall be no limit on the area of the exterior wall coverage using fiber reinforced polymer or the fiberglass reinforced polymer.
 - 2.2. The fiber reinforced polymer or the fiberglass reinforced polymer shall have a flame-spread index of 200 or less. The flame-spread index requirement shall not be required for coatings or paints having a thickness of less than 0.036 inch (0.9 mm) that are applied directly to the surface of the fiber reinforced polymer or the fiberglass reinforced polymer
 - 2.3. Fireblocking complying with Section 717.2.6 shall be installed.
 - 2.4. The fiber reinforced polymer or the fiberglass reinforced polymer shall be designed for uniform live loads as required in Table 1607.1 as well as for snow loads, wind loads and earthquake loads as specified in Sections 1608, 1609 and 1613 respectively.

Reason: The composites industry, material suppliers and manufacturers are working together to introduce FRP composites into the International Building Code. This activity is being conducted under the auspices of the American Composites Manufacturers Association (ACMA), by a collective group of companies focused on the building and construction market. The proposed code change to the IBC in this submittal will help building officials recognize FRP composites and ensure they are being properly used in building construction.

ACMA, headquartered in Arlington, VA is the national trade association representing the composites industry. ACMA is the world's largest composites trade association, with more than 850 member companies, comprising manufacturers, materials and equipment suppliers, distributors, consultants, academia, end-users and other industry stakeholders. Formed in 1979 to provide education and support for composites fabricators and their suppliers in the successful operation of their businesses, ACMA continues to offer leading-edge services that are instrumental in regulatory compliance and formulation, education, training, market development and expansion.

Fiber reinforced polymer (FRP) composites are materials consisting of reinforcement fibers (natural or man-made) impregnated with a fiber-binding polymer (thermoset or thermoplastic) and are then molded and hardened into the intended shape. The reinforcement fibers (such as boron, glass, carbon, aramid) impart strength and stiffness to the composite, while the polymer resin matrix bind the fibers, providing bulk stiffness and protects them from environmental exposure. Common terms associated with FRP composites include fiberglass or fiber reinforced plastic, GFRP (glass fiber) or CFRP (carbon fiber).

Since the mid-1950s, FRP has been adapted to building and construction uses. In historical sequence, these applications have appeared as opaque and translucent (light transmitting) sheet panels; space frame skin structures; structural forms for concrete; sandwich panel structures; and most recently a variety of highly-configured load-bearing and non-load bearing components. Since the early 1990's, FRP composites are being used to externally strengthen concrete and masonry buildings, as well as providing seismic strengthening to beams, columns, slabs, and walls.

Typical FRP architectural products are manufactured in an open mold. The mold surface, which imparts the finished appearance to the completed part, is first coated with a pigmented, specially formulated, durable polyester coating known as gel coat. Various plies of resin saturated fiber reinforcements are added by a technique known as hand lamination or by using spray equipment. Both processes deposits fibers and catalyzed resin onto the gel coated mold surface. The material is then hand compacted by hand rollers and is usually cured at room temperature.

Additives and various fillers, incorporated in the composites enable fabricators to provide finished products with special properties such as resistance to ultra-violet radiation, enhanced fire performance, corrosion-resistance, and color.

Principal markets served by the composites industry are architectural/construction such as replication of historic building ornamentation, bathware, marine, automotive/transportation, corrosion resistant products (tanks and piping) and many others. These products are increasingly being used as building materials and responsible Code guidance is imperative.

This proposed code change provides two definitions, one a generic definition for Fiber Reinforced Polymer and one for a Fiberglass Reinforced Polymer which is a subset of the generic definition. Both are included since both could be used in the applications under consideration. These definitions are industry standard descriptions for these types of materials.

CODE CHANGES RESOURCE COLLECTION – INTERNATIONAL BUILDING CODE

The proposal also adds a new section to Chapter 26 that is specifically written for FRP. The proposal will require that the FRP be labeled and identified in a manner similar to the existing requirements for foam plastic insulation. This requirement will provide assurance to the Code Official that the product in the field is the same as that tested for compliance.

Proposal Sections 2612.3 through 2612.5 provide requirements wherein the FRP must meet existing Code requirements for materials to be used in these specific applications. No changes in required tests, usage, etc. are made for the FRP versus other materials used for these applications.

Section 2612.6 provides new requirements that specifically address the use of the FRP on the exterior of buildings. This Section would allow the FRP to be used on the exterior of buildings of all Types of Construction when it meets specific requirements.

The general charging requirements are that the FRP meet the requirements of Section 2603.5, the requirements for fireblocking per Section 717 and other structural requirements. Section 2603.5 addresses the use of foam plastics in exterior walls of all Types of Construction. By using the requirements in this Section, the FRP must meet tests such as NFPA 285 (Multi-story fire test), NFPA 268 (Radiant Heat test) and have Class A Flame-spread and Smoke-developed Indices as well as meeting other requirements specified in Section 2603.5. As with foam plastics, if a material can meet these requirements, it can be used as an exterior wall covering on buildings of any Type of Construction.

There are two exceptions to the general requirements. The first is for when the FRP is used as building ornamentation such as cornices. An example of this is provided in the picture below (The cornice is FRP installed on a masonry wall). This set of requirements limits the size of the ornamentation and its Flame-spread Index based on the percentage of the material on the wall. The area restrictions are based on potential applications and the philosophy that when larger amounts of materials are installed, the fire properties shall be more restrictive. Requirements are also provided whereby the FRP shall be installed over noncombustible surfaces, fireblocking is required and the design of the installation meets required structural conditions. This set of requirements provides assurances that the materials to be used in this application are appropriate for use and do not create any undue hazard.

The second exception recognizes that the FRP can be used on building up to a height of 40 feet in a manner consistent with other combustible exterior wall coverings. Additionally limits with respect to fire separation distance are also provided in a manner similar to that for MCM panels. Further requirements for fireblocking and structural considerations have also been included.

In summary, this proposal provides recognition of FRP for many building applications and includes appropriate requirements to allow their use in a manner intended by the Code.



Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The committee indicated that the proposed requirements for fiber reinforced polymer and fiberglass reinforced polymer are technically accurate and complete. The products are also currently widely in use. Therefore the proposed provisions for fiber reinforced polymer and fiberglass reinforced polymer are an appropriate addition to the code.

Assembly Action:

None

Final Hearing Results

FS196-07/08

AS

Code Change No: **FS198-07/08**

Original Proposal

Chapter 35

Proponent: Standards writing organizations as listed below.

Revise as follows:

ACI

American Concrete Institute
P. O. Box 9094
Farmington, MI 48333-9094

216.1—07 97

Standard Method for Determining Fire Resistance of Concrete and Masonry Construction Assemblies

ASTM

ASTM International
100 Barr Harbor Drive
West Conshohocken, PA 19428-2959

Standard
reference
number

Title

C 140—07 05a

Test Method Sampling and Testing Concrete Masonry Units and Related Units

C 549—06 02

Specification for Perlite Loose Fill Insulation

C 578—07 04

Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation

C 636/C636M—06 04

Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels

C 1186—07 02

Specification for Flat Nonasbestos Fiber Cement Sheets

C 1289—07 05a

Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board

D 43—00(2006) 94 (2000)

Specification for Coal Tar Primer Used in Roofing, Dampproofing and Waterproofing

D 3462—07 05

Specification for Asphalt Shingles Made From Glass Felt and Surfaced with Mineral Granules

D 3679—06a 05

Specification for Rigid Poly (Vinyl Chloride) (PVC) Siding

E 108—07a 05

Test Methods for Fire Tests of Roof Coverings

E 84-07 05e01

Test Methods for Surface Burning Characteristics of Building Materials

E 96/E96M-0500e04

Test Method for Water Vapor Transmission of Materials

E 119-07 00

Test Methods for Fire Tests of Building Construction and Materials

E 814—06 02

Test Method of Fire Tests of Through-penetration Firestops

F 2090— 01a(2007)

Specification for Window Fall Prevention Devices with Emergency Escape (Egress) Release Mechanisms

DASMA

Door and Access Systems Manufacturers Association International
1300 Summer Avenue
Cleveland, OH 44115-2851

Standard
reference
number

Title

107—98 04 (03)

Room Fire Test Standard for Garage Doors Using Foam Plastic Insulation

FM

Factory Mutual
Standards Laboratories Turnpike
1151 Boston-Providence
Norwood, MA 02062

Standard
reference
number

Title

4880 (2005+)

American National Standard for Evaluating Insulated Wall or Wall and Roof/Ceiling Assemblies, Plastic Interior Finish Materials, Plastic Exterior Building Panels, Wall/Ceiling Coating Systems, Interior and Exterior Finish Systems

GA

Gypsum Association
810 First Street, NE #510
Washington, DC 20002-4268

Standard
reference
number

Title

GA 600— 06 03

Fire-Resistance Design Manual, 18 47th Edition

NFPA

National Fire Protection Association
1 Batterymarch Park
Quincy, MA 02269-9101

Standard
reference
number

Title

80—07 99

Fire Doors and Fire Windows

105—07 03

Standard for the Installation of Smoke Door Assemblies

257- 07 00

Standard on Fire Test for Window and Glass Block Assemblies

265—07 02

Method of Fire Tests for Evaluating Room Fire Growth Contribution of Textile Wall Coverings on Full Height Panels and Walls

268—07 04

Standard Test Method for Determining Ignitibility of Exterior Wall Assemblies Using a Radiant Heat Energy Source

288-07 04

Standard Methods of Fire Tests of Floor Fire Door Assemblies Installed Horizontally in Fire-Resistance-Rated Floor Systems

UL

Underwriters Laboratories
333 Pfingsten Road
Northbrook, IL 60062

Standard
reference
number

Title

14C—2006 99

Swinging Hardware for Standard Tin Clad Fire Doors Mounted Singly and in Pairs

103—01

Factory-built Chimneys, for Residential Type and Building Heating Appliances with Revisions through December 2005 June 2006

127—96

Factory-built Fireplaces—with Revisions through November 2006 4999

555— 2006 99

Fire Dampers

555C—2006 96

Ceiling Dampers

555S—99	Smoke Dampers—with Revisions through April 2003 <u>July 2006</u>
710B—2004	Recirculating Systems with <u>Revisions through April 2006</u>
790—04 98	<u>Standard</u> Tests Methods for Fire <u>Tests</u> Resistance-of Roof Coverings <u>Materials</u>
1256—02	Fire Test of Roof Deck Construction – <u>with Revisions through January 2007</u>
1479—03	Fire Tests of Through-Penetration Fire stops— <u>with Revisions through April 2007</u>

Reason: The *CP 28 Code Development Policy*, Section 4.5* requires the updating of referenced standards to be accomplished administratively, and be processed as a Code Change Proposal. In May 2007, a letter was sent to each developer of standards that is referenced in the International Codes, asking them to provide ICC with a list of their standards in order to update to the current edition. Above is the received list of the referenced standards that are under the maintenance responsibility of the IBC Fire Safety Committee.

***4.5 Updating Standards:** The updating of standards referenced by the Codes shall be accomplished administratively by the appropriate code development committee in accordance with these full procedures except that multiple standards to be updated may be included in a single proposal.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: This is simply an administrative update, therefore the committee recommends approval.

Assembly Action:

None

Final Hearing Results

FS198-07/08

AS

IBC – GENERAL

Code Change No: **G6-07/08**

Original Proposal

Sections: 106.1; IFC 105.4.1; IRC R106.1; IEBC 106.1

Proponent: Lori Lee Graham, City of Portland, OR

THESE PROPOSALS ARE ON THE AGENDA OF THE IBC GENERAL, IFC, IRC BUILDING/ENERGY AND IEBC CODE DEVELOPMENT COMMITTEES AS 4 SEPARATE CODE CHANGES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IBC GENERAL

Revise as follows:

106.1 (Supp) General. Submittal documents consisting of construction documents, statement of special inspections and other data shall be submitted in ~~one~~ two or more sets with each permit application. The construction documents shall be prepared by a registered design professional where required by the statutes of the jurisdiction in which the project is to be constructed. Where special conditions exist, the building official is authorized to require additional construction documents to be prepared by a registered design professional.

Exception: The building official is authorized to waive the submission of construction documents and other data not required to be prepared by a registered design professional if it is found that the nature of the work applied for is such that review of construction documents is not necessary to obtain compliance with this code.

PART II – IFC

Revise as follows:

105.4.1 Submittals. Construction documents shall be submitted in ~~one~~ two or more sets and in such form and detail as required by the fire code official. The construction documents shall be prepared by a registered design professional where required by the statutes of the jurisdiction in which the project is to be constructed.

PART III – IRC BUILDING/ENERGY

Revise as follows:

R106.1 Submittal documents. ~~Submittal documents consisting of construction documents, special inspection and structural observation programs~~ and other data shall be submitted in ~~one~~ two or more sets with each application for a permit. The construction documents shall be prepared by a registered design professional where required by the statutes of the jurisdiction in which the project is to be constructed. Where special conditions exist, the building official is authorized to require additional construction documents to be prepared by a registered design professional.

Exception: The building official is authorized to waive the submission of construction documents and other data not required to be prepared by a registered design professional if it is found that the nature of the work applied for is such that reviewing of construction documents is not necessary to obtain compliance with this code.

PART IV – IEBC

Revise as follows:

106.1 (Supp) General. Submittal documents consisting of construction documents special inspection and structural observation programs, investigation and evaluation reports, and other data shall be submitted in ~~one~~ two or more sets with each application for a permit. The construction documents shall be prepared by a registered design

professional where required by the statutes of the jurisdiction in which the project is to be constructed. Where special conditions exist, the code official is authorized to require additional construction documents to be prepared by a registered design professional.

Exception: The code official is authorized to waive the submission of construction documents and other data not required to be prepared by a registered design professional if it is found that the nature of the work applied for is such that reviewing of construction documents is not necessary to obtain compliance with this code

Reason: Section 106.3.1 of the IBC requires that when the construction documents are approved, one set is retained by the building official and one set is returned to the applicant to be kept at the work site. Since at least 2 sets are required at permit issuance, there should be at least 2 sets submitted. With respect to this requirement the 2006 I-codes are consistent in requiring 2 sets at issuance, but inconsistent in requiring 2 sets at application. As currently written the IBC, IFC, IRC and IEBC require one set at application; the IMC, IPC, IWUIC and the IFGC require 2 sets at application. The codes should be consistent. Companion proposals have been submitted for the IFC, IRC and IEBC.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

PART I – IBC GENERAL

Committee Action:

Approved as Submitted

Committee Reason: The proposal was approved as it provides consistency throughout the code with the number of plans and other documentation required to be submitted.

Assembly Action:

None

PART II – IFC

Withdrawn by Proponent

PART III – IRC-B/E

Committee Action:

Disapproved

Committee Reason: The specific number of construction documents to be submitted is a policy decision that is better left up to the local authority having jurisdiction.

Assembly Action:

None

PART IV – IEBC

Committee Action:

Disapproved

Committee Reason: The committee felt that this proposed provision is unnecessary. The authority having jurisdiction can determine how many copies of documents that it needs.

Assembly Action:

None

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Lori Lee Graham, City of Portland, OR, representing herself requests Approval as Submitted for Parts III and IV.

Commenter's Reason: This is an editorial proposal. Two portions of this proposal were approved in some fashion (Part I alone and Part II in code change F15 07/08). This change simply makes it so all of the International Codes are requiring the same number of plans. Approving Parts II and IV of this change will bring consistency amongst all of the codes.

Final Hearing Results

G6-07/08, Part I	AS
G6-07/08, Part II	WP
G6-07/08, Part III	AS
G6-07/08, Part IV	AS

Code Change No: **G10-07/08**

Original Proposal

Sections: 109.3.6; IEBC 109.3.6

Proponent: Bill McHugh, Firestop Contractors International Association

THESE PROPOSALS ARE ON THE AGENDA OF THE IBC GENERAL AND IEBC CODE DEVELOPMENT COMMITTEES AS 2 SEPARATE CODE CHANGES. SEE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IBC GENERAL

Revise as follows:

109.3.6 Fire and smoke-resistant penetrations. Protection of joints and penetrations in fire-resistance-rated assemblies, smoke barriers and smoke partitions shall not be concealed from view until inspected and approved.

PART II – IEBC

Revise as follows:

109.3.6 Fire and smoke-resistant penetrations. Protection of joints and penetrations in fire-resistance-rated assemblies, smoke barriers and smoke partitions shall not be concealed from view until inspected and approved.

Reason: Protection of penetrations and joints in fire and smoke resistance rated construction is very important to maintain tenability for egress or remaining in place until evacuated from a compartment, in compartmentation used in corridors, occupancy separations, and between floors.

Current code only requires that fire resistant penetrations and joints not be concealed from view until inspected and approved. Both fire and smoke-resistance-rated penetrations and joints should be included as smoke travel is very important for tenability. This code change proposal brings consistency between the fire-resistance-rated penetrations and the fire/smoke-resistance-rated or smoke-resistance-rated penetrations, which may or may not have a fire-resistance-rating.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

PART I – IBC GENERAL

Committee Action:

Approved as Submitted

Committee Reason: The provisions will increase the quality of construction in the area of smoke resistance to ensure that such aspects of the building perform as expected.

Assembly Action:

None

PART II – IEBC

Committee Action:

Approved as Submitted

Committee Reason: The need to keep joints in smoke barriers and smoke partitions open to view until inspection is just as important as that for fire resistance rated construction.

Assembly Action:

None

Final Hearing Results

G10-07/08, Part I	AS
G10-07/08, Part II	AS

Code Change No: **G13-07/08**

Original Proposal

Sections: 202, 502.1, 902.1 (IFC [B] 902.1), 1612.2, 412.2.2, [F] 415.4, [F] 903.2.8.1 (IFC 903.2.8.1), 1203.3, 1915.5, 2111.13.3, 2308.11.2, 2308.12.2

Proponent: Philip Brazil, PE, Reid Middleton, Inc., representing himself

Revise as follows:

SECTION 202 DEFINITIONS

BASEMENT (for other than flood loads). See Sections 502.1 and 1612.2.

BASEMENT (for flood loads). See Section 1612.2.

STORY ABOVE GRADE PLANE. (Supp) Any story having its finished floor surface entirely above grade plane, or in which the finished surface of the floor or roof next above is:

1. More than 6 feet (1829 mm) above grade plane; or
2. More than 12 feet (3658 mm) above the finished ground level at any point.

502.1 Definitions. The following words and terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

BASEMENT (Supp) A story that is not a story above grade plane (See “Story above grade plane” in Section 202).

The definition of “Basement” does not apply to the provisions of Section 1612 for flood loads (see “Basement” in Section 1612.2).

902.1 (IFC [B] 902.1) Definitions. The following words and terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

FIRE AREA (Supp). The aggregate floor area enclosed and bounded by fire walls, fire barriers, exterior walls or fire resistance-rated horizontal assemblies of a building. Areas of the building not provided with surrounding walls shall be included in the fire area if such areas are included within the horizontal projection of the roof or floor next above.

1612.2 Definitions. The following words and terms shall, for the purposes of this section, have the meanings shown herein.

BASEMENT. The portion of a building having its floor subgrade (below ground level) on all sides.
The definition of “Basement” is limited in application to the provisions of Section 1612 (see “Basement” in Section 502.1).

412.2.2 Basements. Where hangars have basements, ~~the floor over the basements~~ shall be of Type IA construction and shall be made tight against seepage of water, oil or vapors. There shall be no opening or communication between ~~the basements~~ and the hangar. Access to ~~the basements~~ shall be from outside only.

[F] 415.4 Special provisions for Group H-1 occupancies. Group H-1 occupancies shall be in buildings used for no other purpose, shall not exceed one story in height and be without a ~~basements~~, crawl spaces or other under-floor spaces. Roofs shall be of lightweight construction with suitable thermal insulation to prevent sensitive material from reaching its decomposition temperature. Group H-1 occupancies containing materials which are in themselves both physical and health hazards in quantities exceeding the maximum allowable quantities per control area

[F] 903.2.8.1 (IFC 903.2.8.1) (Supp) Repair garages. An automatic sprinkler system shall be provided throughout all buildings used as repair garages in accordance with Section 406, as shown:

1. Buildings having two or more stories above grade plane, including basements, with a fire area containing a repair garage exceeding 10,000 square feet (929 m²).
2. Buildings no more than one story above grade plane, with a fire area containing a repair garage exceeding 12,000 square feet (1115 m²).
3. Buildings with a repair garages servicing vehicles parked in the basements.

1203.3 Under-floor ventilation. The space between the bottom of the floor joists and the earth under any building except spaces occupied by a basements or cellars shall be provided with ventilation openings through foundation walls or exterior walls. Such openings shall be placed so as to provide cross ventilation of the under-floor space.

1915.5 (Supp) Fire-resistance-rating protection. Pipe columns shall be of such size or so protected as to develop the required fire-resistance ratings specified in Table 601. Where an outer steel shell is used to enclose the fire protective covering, the shell shall not be included in the calculations for strength of the column section. The minimum diameter of pipe columns shall be 4 inches (102 mm) except that in structures of Type V construction not exceeding three stories or 40 feet (12 192 mm) in height, pipe columns used in the basements and as secondary steel members shall have a minimum diameter of 3 inches (76 mm).

2111.13.3 Exterior air intake. The exterior air intake shall be capable of providing all combustion air from the exterior of the dwelling. The exterior air intake shall not be located within the a garage, attic, basement or crawl space of the dwelling nor shall the air intake be located at an elevation higher than the firebox. The exterior air intake shall be covered with a corrosion-resistant screen of 1/4-inch (6.4 mm) mesh.

2308.11.2 (Supp) Concrete or masonry. Concrete or masonry walls and stone or masonry veneer shall not extend above the a basement.

Exceptions:

1. Stone and masonry veneer is permitted to be used in the first two stories above grade plane or the first three stories above grade plane where the lowest story has concrete or masonry walls in Seismic Design Category B, provided that structural use panel wall bracing is used and the length of bracing provided is one- and one half times the required length as determined in Table 2308.9.3(1).
2. Stone and masonry veneer is permitted to be used in the first story above grade plane or the first two stories above grade plane where the lowest story has concrete or masonry walls in Seismic Design Category B or C.
3. Stone and masonry veneer is permitted to be used in the first two stories above grade plane in Seismic Design Categories B and C, provided the following criteria are met:
 - 3.1. Type of brace per Section 2308.9.3 shall be Method 3 and the allowable shear capacity in accordance with Table 2306.4.1 shall be a minimum of 350 plf (5108 N/m).
 - 3.2. The bracing of the top story shall be located at each end and at least every 25 feet (7620 mm) o.c. but not less than 40 percent of the braced wall line. The bracing of the first story shall be located at each end and at least every 25 feet (7620 mm) o.c. but not less than 35 percent of the braced wall line.
 - 3.3. Hold-down connectors shall be provided at the ends of braced walls for the second floor to first floor wall assembly with an allowable design of 2,000 pounds (8896 N). Hold-down connectors shall be provided at the ends of each wall segment of the braced walls for the first floor to foundation with an allowable design of 3,900 pounds (17 347 N). In all cases, the hold-down connector force shall be transferred to the foundation.
 - 3.4. Cripple walls shall not be permitted.

2308.12.2 (Supp) Concrete or masonry. Concrete or masonry walls and stone or masonry veneer shall not extend above the a basement.

Exception: Stone and masonry veneer is permitted to be used in the first story above grade plane in Seismic Design Category D, provided the following criteria are met:

1. Type of brace in accordance with Section 2308.9.3 shall be Method 3 and the allowable shear capacity in accordance with Table 2306.4.1 shall be a minimum of 350 plf (5108 N/m).
2. The bracing of the first story shall be located at each end and at least every 25 feet (7620 mm) o.c. but not less than 45 percent of the braced wall line.

3. Hold-down connectors shall be provided at the ends of braced walls for the first floor to foundation with an allowable design of 2,100 pounds (9341 N).
4. Cripple walls shall not be permitted.

Reason: Proposal G8-06/07-AMPC1 revised the definition of “basement” to be a story that is not a story above grade plane. The proposal extends these changes to other sections of the IBC. A “story” is a vertical space between each floor and between the upper floor and the roof. There are instances where a basement is assumed to be all stories below grade plane instead of an individual story below grade plane. The proposal makes the necessary corrections for consistency with the revised definition of “basement.”

A comprehensive review of the 2006 IBC and 2007 Supplement was made during the preparation of this proposal and it was determined that, except for flood loads (below), the code sections referring to basements do so consistent with the revised definition of “basement” except for the code sections in this proposal. Approximately 50 such code sections were studied.

The definition of “story” in Section 202 establishes the vertical space as “between the upper surface of a floor and the upper surface of the floor or roof next above.” The proposal revises the definitions of “story above grade plane” in Section 202 and “fire area” in Section 902.1 for consistency with this definition.

The definition of “basement” in Section 502.1 applies to all provisions of the IBC except for flood loads in Section 1612 for which there is a separate definition of “basement” (see Section 1612.2). This proposal adds language following the definitions in Sections 502.1 and 1612.2 and revises Section 202 to clarify the application of both definitions.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The proposal provides a necessary editorial clean up of the definition of the term basement and its use throughout the code.

Assembly Action:

None

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Lori Lee Graham, City of Portland, OR, representing herself requests Approval as Modified by this public comment.

Modify proposal as follows:

**SECTION 202
DEFINITIONS**

STORY ABOVE GRADE PLANE. (Supp) Any story having its finished floor surface entirely above grade plane, or in which the finished surface of the floor ~~or roof~~ next above is:

1. More than 6 feet (1829 mm) above grade plane; or
2. More than 12 feet (3658 mm) above the finished ground level at any point.

(Portions of proposal not shown remain unchanged)

Commenter's Reason: Measuring to the roof next above is problematic. On a mansard roof, where do I measure? On a pitched roof, where do I measure? If the roof is flat, I have a good idea where I measure, but in all other instances I don't. It is inappropriate to determine whether a story is a story above grade based on something as variable as the roof surface.

Final Hearing Results

G13-07/08

AMPC

Code Change No: **G14-07/08**

Original Proposal

Sections: 202 (New), 403.1, 707.14.1; IFC 903.3.5.2 (IBC [F] 903.3.5.2), 903.4.3 (IBC [F] 903.4.3), 907.2.12 (IBC [F] 907.2.12), 907.7.3.2 (IBC [F] 907.7.3.2)

Proponent: Tom Lariviere, Madison Fire Department, MS, representing the Joint Fire Service Review Committee

THESE PROPOSALS ARE ON THE AGENDA OF THE IBC GENERAL AND IFC CODE DEVELOPMENT COMMITTEES AS 2 SEPARATE CODE CHANGES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IBC GENERAL

1. Add a new definition as follows:

SECTION 202
DEFINITIONS

HIGH-RISE BUILDING. A building with an occupied floor located more than 75 feet (23 m) above the lowest level of fire department vehicle access.

2. Revise as follows:

403.1 Applicability. ~~The provisions of this section shall apply to buildings with an occupied floor located more than 75 feet (22 860 mm) above the lowest level of fire department vehicle access.~~ High rise buildings shall comply with Section 403.2 through 403.18.

Exception: The provisions of ~~this~~ Section 403.2 through 403.18 shall not apply to the following buildings and structures:

1. Airport traffic control towers in accordance with Section 412.
2. Open parking garages in accordance with Section 406.3.
3. Buildings with an occupancy in Group A-5 in accordance with Section 303.1.
4. Low-hazard special industrial occupancies in accordance with Section 503.1.1.
5. Buildings with an occupancy in Group H-1, H-2 or H-3 in accordance with Section 415.

707.14.1 (Supp) Elevator lobby. An enclosed elevator lobby shall be provided at each floor where an elevator shaft enclosure connects more than three stories. The lobby shall separate the elevator shaft enclosure doors from each floor by fire partitions equal to the fire-resistance rating of the corridor and the required opening protection. Elevator lobbies shall have at least one means of egress complying with Chapter 10 and other provisions within this code.

Exceptions:

1. Enclosed elevator lobbies are not required at the street floor, provided the entire street floor is equipped with an automatic sprinkler system in accordance with Section 903.3.1.1.
2. Elevators not required to be located in a shaft in accordance with Section 707.2 are not required to have enclosed elevator lobbies.
3. Where additional doors are provided at the hoistway opening in accordance with Section 3002.6. Such doors shall be tested in accordance with UL 1784 without an artificial bottom seal.
4. In other than Group I-2 and I-3, and high-rise buildings having occupied floors located more than 75 feet (22 860 mm) above the lowest level of fire department vehicle access, enclosed elevator lobbies are not required where the building is protected by an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2.
5. Smoke partitions shall be permitted in lieu of fire partitions to separate the elevator lobby at each floor where the building is equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2.
6. Enclosed elevator lobbies are not required where the elevator hoistway is pressurized in accordance with Section 707.14.2.

PART II – IFC**Revise as follows:**

903.3.5.2(IBC [F] 903.3.5.2) Secondary water supply. A secondary on-site water supply equal to the hydraulically calculated sprinkler demand, including the hose stream requirement, shall be provided for high-rise buildings required to comply with Section 403 of the *International Building Code* in Seismic Design Category C, D, E or F as determined by this code. The secondary water supply shall have a duration of not less than 30 minutes as determined by the occupancy hazard classification in accordance with NFPA 13.

Exception: ~~Existing buildings.~~

903.4.3 (IBC [F] 903.4.3) Floor control valves. Approved supervised indicating control valves shall be provided at the point of connection to the riser on each floor in high-rise buildings required to comply with Section 403 of the *International Building Code*.

907.2.12 (IBC [F] 907.2.12) (Supp) High-rise buildings. ~~Buildings with a floor used for human occupancy located more than 75 feet (22 860 mm) above the lowest level of fire department vehicle access~~ High rise buildings shall be provided with an automatic fire alarm system and an emergency voice/alarm communication system in accordance with Section 907.6.2.2.

Exceptions:

1. Airport traffic control towers in accordance with Sections 907.2.21 and 412.
2. Open parking garages in accordance with Section 406.3.
3. Buildings with an occupancy in Group A-5 in accordance with Section 303.1.
4. Low-hazard special occupancies in accordance with Section 503.1.1.
5. Buildings with an occupancy in Group H-1, H-2 or H-3 in accordance with Section 415.
6. In Group I-1 and I-2 occupancies, the alarm shall sound at a constantly attended location and general occupant notification shall be broadcast by the paging system.

907.7.3.2 (IBC [F] 907.7.3.2) (Supp) High-rise buildings. ~~In buildings with a floor used for human occupancy that is located more than 75 feet (22 860 mm) above the lowest level of fire department vehicle access,~~ high rise buildings required to comply with Section 403 of the *International Building Code*, a separate zone by floor shall be provided for all of the following types of alarm-initiating devices where provided:

1. Smoke detectors.
2. Sprinkler water-flow devices.
3. Manual fire alarm boxes.
4. Other approved types of automatic fire detection devices or suppression systems.

Reason: The term “High-Rise Building” is utilized in numerous locations through-out the IBC and IFC. However, there is no definition for a “High-Rise Building.” This definition is proposed from and is consistent with the high-rise building applicability language in section 403.1 of the IBC. The definition will be applied to both the IFC and the IBC and provide consistency.

Additionally, Section 903.3.5.2 is revised by deleting the exception. The exception refers to existing buildings and is not necessary in this section. IFC Section 903.6 deals specifically with existing buildings and this provision is not required in that section. Therefore, it is not necessary under the major section 903.3 since it does not address existing buildings at all.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results
PART I – IBC GENERAL**Committee Action:****Approved as Submitted**

Committee Reason: Clarifies throughout the code that a high rise building is a building with an occupied floor located more than 75 feet (22 860 mm) above the lowest level of fire department vehicle access.

Assembly Action:**None****PART II – IFC****Committee Action:****Disapproved**

Committee Reason: The proposed added text would be redundant since high-rise buildings must already comply with IBC Section 403. The deletion of the exception in Section 903.3.5.2 is inappropriate in light of the difficulties in retrofitting existing buildings.

Assembly Action:

None

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Tom Lariviere, Madison Fire Department, MS, representing the Joint Fire Service Review Committee requests Approval as Modified by this public comment for Part II.

Modify proposal as follows:

903.3.5.2 (IBC [F] 903.3.5.2) Secondary water supply. A secondary on-site water supply equal to the hydraulically calculated sprinkler demand, including the hose stream requirement, shall be provided for high-rise buildings ~~required to comply with Section 403 of the International Building Code~~ in Seismic Design Category C, D, E or F as determined by this code. The secondary water supply shall have a duration of not less than 30 minutes as determined by the occupancy hazard classification in accordance with NFPA 13.

Exception: Existing buildings.

903.4.3 (IBC [F] 903.4.3) Floor control valves. Approved supervised indicating control valves shall be provided at the point of connection to the riser on each floor in high-rise buildings ~~required to comply with Section 403 of the International Building Code.~~

907.2.12 (IBC [F] 907.2.12) (Supp) High-rise buildings. High rise buildings shall be provided with an automatic fire alarm system and an emergency voice/alarm communication system in accordance with Section 907.6.2.2.

Exceptions:

1. Airport traffic control towers in accordance with Sections 907.2.21 and 412.
2. Open parking garages in accordance with Section 406.3.
3. Buildings with an occupancy in Group A-5 in accordance with Section 303.1.
4. Low-hazard special occupancies in accordance with Section 503.1.1.
5. Buildings with an occupancy in Group H-1, H-2 or H-3 in accordance with Section 415.
6. In Group I-1 and I-2 occupancies, the alarm shall sound at a constantly attended location and general occupant notification shall be broadcast by the paging system.

907.7.3.2 (IBC [F] 907.7.3.2) (Supp) High-rise buildings. In high rise buildings ~~required to comply with Section 403 of the International Building Code~~, a separate zone by floor shall be provided for all of the following types of alarm-initiating devices where provided:

1. Smoke detectors.
2. Sprinkler water-flow devices.
3. Manual fire alarm boxes.
4. Other approved types of automatic fire detection devices or suppression systems.

Commenter's Reason: The term "High-Rise Building" is utilized in numerous locations through-out the IBC and IFC. Part I was Approved as Submitted by the IBC General Committee which added the definition of "High-Rise Building" to the IBC. This definition is consistent with, and replaces the language used in each of the sections.

The revisions in this Public Comment to Part II will utilize the same definition in the IFC and provide consistency between the codes. The phrase "required to comply with Section 403 of the IBC" has been deleted since it is redundant and Section 403 only addresses high rise buildings.

Additionally, Section 903.3.5.2 is revised by re-inserting the exception. The exception refers to existing buildings and would only apply when an existing high rise is being retrofit with fire sprinklers. The difficulty in retrofitting existing high rise buildings would only be compounded if this exception is deleted, and the high rise building is not structurally designed to support the secondary water supply.

Final Hearing Results

**G14-07/08, Part I
G14-07/08, Part II**

**AS
AMPC**

Code Change No: **G16-07/08**

Original Proposal

Sections: 202 (New); IECC 202; IFC 202; IFGC 202; IMC 202; IPMC 202; IRC 202

Proponent: Bob Eugene, Underwriters Laboratories Inc.

THESE PROPOSALS ARE ON THE AGENDA OF THE IBC GENERAL, IECC, IFC, IFGC, IMC, IPMC AND IRC BUILDING/ENERGY CODE DEVELOPMENT COMMITTEES AS 7 SEPARATE CODE CHANGES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IBC GENERAL

Add new definition as follows:

SECTION 202 DEFINITIONS

LABELED. Equipment, materials or products to which have been affixed a label, seal, symbol or other identifying mark of a nationally recognized testing laboratory, inspection agency or other organization concerned with product evaluation that maintains periodic inspection of the production of the above-labeled items and whose labeling indicates either that the equipment, material or product meets identified standards or has been tested and found suitable for a specified purpose.

PART II – IECC

Revise as follows:

SECTION 202 GENERAL DEFINITIONS

~~**LABELED.** Devices, equipment, or materials to which have been affixed a label, seal, symbol or other identifying mark of a nationally recognized testing laboratory, inspection agency or other organization concerned with product evaluation that maintains periodic inspection of the production of the above-labeled items that attests to compliance with a specific standard.~~

Equipment, materials or products to which have been affixed a label, seal, symbol or other identifying mark of a nationally recognized testing laboratory, inspection agency or other organization concerned with product evaluation that maintains periodic inspection of the production of the above-labeled items and whose labeling indicates either that the equipment, material or product meets identified standards or has been tested and found suitable for a specified purpose.

PART III – IFC

Revise as follows:

SECTION 202 GENERAL DEFINITIONS

~~**LABELED.** Equipment or material to which has been attached a label, symbol or other identifying mark of a nationally recognized testing laboratory, inspection agency or other organization concerned with product evaluation that maintains periodic inspection of production of labeled equipment or materials, and by whose labeling is indicated compliance with nationally recognized standards or tests to determine suitable usage in a specified manner.~~

Equipment, materials or products to which have been affixed a label, seal, symbol or other identifying mark of a nationally recognized testing laboratory, inspection agency or other organization concerned with product evaluation that maintains periodic inspection of the production of the above-labeled items and whose labeling indicates either that the equipment, material or product meets identified standards or has been tested and found suitable for a specified purpose.

PART IV – IFGC

Revise as follows:

**SECTION 202 (IFGC)
GENERAL DEFINITIONS**

~~LABELED. Devices, equipment, appliances or materials to which have been affixed a label, seal, symbol or other identifying mark of a nationally recognized testing laboratory, inspection agency or other organization concerned with product evaluation that maintains periodic inspection of the production of the above-labeled items and by whose label the manufacturer attests to compliance with applicable nationally recognized standards.~~

Equipment, materials or products to which have been affixed a label, seal, symbol or other identifying mark of a nationally recognized testing laboratory, inspection agency or other organization concerned with product evaluation that maintains periodic inspection of the production of the above-labeled items and whose labeling indicates either that the equipment, material or product meets identified standards or has been tested and found suitable for a specified purpose.

PART V – IMC

Revise as follows:

**SECTION 202
GENERAL DEFINITIONS**

~~LABELED. Devices, equipment, appliances or materials to which have been affixed a label, seal, symbol or other identifying mark of a nationally recognized testing laboratory, inspection agency or other organization concerned with product evaluation that maintains periodic inspection of the production of the above-labeled items and by whose label the manufacturer attests to compliance with applicable nationally recognized standards.~~

Equipment, materials or products to which have been affixed a label, seal, symbol or other identifying mark of a nationally recognized testing laboratory, inspection agency or other organization concerned with product evaluation that maintains periodic inspection of the production of the above-labeled items and whose labeling indicates either that the equipment, material or product meets identified standards or has been tested and found suitable for a specified purpose.

PART VI – IPMC

Revise as follows:

**SECTION 202
GENERAL DEFINITIONS**

~~LABELED. Devices, equipment, appliances, or materials to which has been affixed a label, seal, symbol or other identifying mark of a nationally recognized testing laboratory, inspection agency or other organization concerned with product evaluation that maintains periodic inspection of the production of the above-labeled items and by whose label the manufacturer attests to compliance with applicable nationally recognized standards.~~

Equipment, materials or products to which have been affixed a label, seal, symbol or other identifying mark of a nationally recognized testing laboratory, inspection agency or other organization concerned with product evaluation that maintains periodic inspection of the production of the above-labeled items and whose labeling indicates either that the equipment, material or product meets identified standards or has been tested and found suitable for a specified purpose.

PART VII – IRC BUILDING/ENERGY**Revise as follows:**

~~**LABELED.** Devices, equipment or materials to which have been affixed a label, seal, symbol or other identifying mark of a testing laboratory, inspection agency or other organization concerned with product evaluation that maintains periodic inspection of the production of the above-labeled items that attests to compliance with a specific standard.~~

Equipment, materials or products to which have been affixed a label, seal, symbol or other identifying mark of a nationally recognized testing laboratory, inspection agency or other organization concerned with product evaluation that maintains periodic inspection of the production of the above-labeled items and whose labeling indicates either that the equipment, material or product meets identified standards or has been tested and found suitable for a specified purpose.

Reason: The term “labeled” is used throughout the *International Building Code* and other I-Codes. It is preferred to have such a definition in Chapter 2 rather than elsewhere in code. The definition complements the definition of “LABEL” currently in IBC Section 1702.1 and the requirements of IBC Section 1703.5. Through a series of proposals, the exact same generic text is being proposed for each of the I-codes where the term is used.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results
PART I – IBC GENERAL**Committee Action:****Approved as Submitted**

Committee Reason: Defining the term ‘labeled’ provides a necessary definition and will add clarity and consistency to the code.

Assembly Action:**None****PART II – IECC****Committee Action:****Approved as Submitted**

Committee Reason: This definition for “labeled” needs to be the same definition throughout the I-Codes for purposes of uniform application of the codes for products requiring third party certification.

Assembly Action:**None****PART III – IFC****Committee Action:****Approved as Submitted**

Committee Reason: The change will provide a clearer definition that is correlated with its companion term “Listed”. Approval is also consistent with the actions taken on Parts I and II, and IV through VI to correlate with the other I-Codes.

Assembly Action:**None****PART IV – IFGC****Committee Action:****Approved as Modified****Modify proposal as follows:**

LABELED. Equipment, appliances, materials or products to which have been affixed a label, seal, symbol or other identifying mark of a nationally recognized testing laboratory, inspection agency or other organization concerned with product evaluation that maintains periodic inspection of the production of the above-labeled items and whose labeling indicates either that the equipment, appliance, material or product meets identified standards or has been tested and found suitable for a specified purpose.

Committee Reason: The proposed definition will provide consistent text throughout the codes in the ICC family. The modification adds “appliances” because the IFGC regulates gas appliances which do not fall under the definition of equipment and which are required to be listed and labeled.

Assembly Action:**None****PART V – IMC****Committee Action:****Approved as Modified**

Modify proposal as follows:

LABELED. Equipment, appliances, materials or products to which have been affixed a label, seal, symbol or other identifying mark of a nationally recognized testing laboratory, inspection agency or other organization concerned with product evaluation that maintains periodic inspection of the production of the above-labeled items and whose labeling indicates either that the equipment, material or product meets identified standards or has been tested and found suitable for a specified purpose.

Committee Reason: The latter part of this definition was reworded to better clarify what labeling a product signifies. The definition will be coordinated with all other I-codes. The modification added the term “appliances” back into the definition from the existing language to complete the list of items which receive labels.

Assembly Action: **None**

PART VI – IPMC

Committee Action: **Approved as Submitted**

Committee Reason: The proposal was approved to provide consistency across the I-Codes with respect to the technical definition of the term “label.”

Assembly Action: **None**

PART VII – IRC-B/E

Committee Action: **Disapproved**

Committee Reason: The committee preferred the current language in the code for consistency across the International Codes with respect to the technical definition of the term “labeled.”

Assembly Action: **Approved as Submitted**

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Bob Eugene, Underwriters Laboratories Inc. requests Approval as Submitted for Part IV and V.

Commenter’s Reason: Although “appliances” would not be included under the term “equipment”, they would be included under the term “products”, so the definition as submitted is not flawed. Appliances are products that are required to be listed and labeled elsewhere in the code. The definition for “Labeled” was approved as Submitted in the International Building Code, International Energy Conservation Code, International Fire Code and International Property Maintenance Code. For the sake of consistency and user-friendliness, the definition proposed needs to be Approved as Submitted.

This item is on the agenda for individual consideration because an assembly action was successful and a public comment was submitted.

Public Comment:

Bob Eugene, Underwriters Laboratories Inc. requests Approval as Submitted for Part VII.

Commenter’s Reason: The membership in attendance at Palm Springs recognized the benefit of having a consistent definition for the term “labeled” as used throughout the family of International Codes. The definition for “Labeled” was Approved as Submitted in the International Building Code, International Energy Conservation Code, International Fire Code and International Property Maintenance Code. The Fuel Gas and Mechanical Committees each modified the definition differently from the submitted definition and from each other’s modified definitions. For the sake of consistency and user-friendliness, the definition proposed needs to be Approved as Submitted.

Final Hearing Results

G16-07/08, Part I	AS
G16-07/08, Part II	AS
G16-07/08, Part III	AS
G16-07/08, Part IV	AS
G16-07/08, Part V	AS
G16-07/08, Part VI	AS
G16-0708, Part VII	AS

Code Change No: **G17-07/08**

Original Proposal

Sections: 202; IECC 202; IFC 202 (IBC [F] 902.1); IFGC 202; IMC 202; IRC 202

Proponent: Bob Eugene, Underwriters Laboratories Inc.

THESE PROPOSALS ARE ON THE AGENDA OF THE IBC GENERAL, IECC, IFC, IFGC, IMC AND IRC BUILDING/ENERGY CODE DEVELOPMENT COMMITTEES AS 6 SEPARATE CODE CHANGES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IBC GENERAL

1. Revise as follows:

SECTION 202 DEFINITIONS

LISTED. ~~See Section 902.1.~~ Equipment, materials, products or services included in a list published by an organization acceptable to the code official and concerned with evaluation of products or services that maintains periodic inspection of production of listed equipment or materials or periodic evaluation of services and whose listing states either that the equipment, material, product or service meets identified standards or has been tested and found suitable for a specified purpose.

PART II – IECC

Revise as follows:

SECTION 202 GENERAL DEFINITIONS

LISTED. ~~Equipment, appliances, assemblies or materials included in a list published by an approved testing laboratory, inspection agency or other organization concerned with product evaluation that maintains periodic inspection of production of listed equipment, appliances, assemblies or material, and whose listing states either that the equipment, appliances, assemblies, or material meets nationally recognized standards or has been tested and found suitable for use in a specified manner.~~

Equipment, materials, products or services included in a list published by an organization acceptable to the code official and concerned with evaluation of products or services that maintains periodic inspection of production of listed equipment or materials or periodic evaluation of services and whose listing states either that the equipment, material, product or service meets identified standards or has been tested and found suitable for a specified purpose.

PART III – IFC

Revise as follows:

SECTION 202 (IBC [F] 902.1) GENERAL DEFINITIONS

LISTED. ~~Equipment or materials included on a list published by an approved testing laboratory, inspection agency or other organization concerned with current product evaluation that maintains periodic inspection of production of listed equipment or materials, and whose listing states that equipment or materials comply with approved nationally recognized standards and have been tested or evaluated and found suitable for use in a specified manner.~~

Equipment, materials, products or services included in a list published by an organization acceptable to the code official and concerned with evaluation of products or services that maintains periodic inspection of production of listed equipment or materials or periodic evaluation of services and whose listing states either that the equipment, material, product or service meets identified standards or has been tested and found suitable for a specified purpose.

PART IV – IFGC

Revise as follows:

SECTION 202 GENERAL DEFINITIONS

~~**LISTED.** Equipment, appliances or materials included in a list published by a nationally recognized testing laboratory, inspection agency or other organization concerned with product evaluation that maintains periodic inspection of production of listed equipment, appliances or materials, and whose listing states either that the equipment, appliance or material meets nationally recognized standards or has been tested and found suitable for use in a specified manner. The means for identifying listed equipment, appliances or materials may vary for each testing laboratory, inspection agency or other organization concerned with product evaluation, some of which do not recognize equipment, appliances or materials as listed unless they are also labeled. The authority having jurisdiction shall utilize the system employed by the listing organization to identify a listed product.~~

Equipment, materials, products or services included in a list published by an organization acceptable to the code official and concerned with evaluation of products or services that maintains periodic inspection of production of listed equipment or materials or periodic evaluation of services and whose listing states either that the equipment, material, product or service meets identified standards or has been tested and found suitable for a specified purpose.

PART V – IMC

Revise as follows:

SECTION 202 GENERAL DEFINITIONS

~~**LISTED.** Equipment, appliances or materials included in a list published by a nationally recognized testing laboratory, inspection agency or other organization concerned with product evaluation that maintains periodic inspection of production of listed equipment, appliances or materials, and whose listing states either that the equipment, appliances or material meets nationally recognized standards or has been tested and found suitable for use in a specified manner. Not all testing laboratories, inspection agencies and other organizations concerned with product evaluation use the same means for identifying listed equipment, appliances or materials. Some do not recognize equipment, appliances or materials as listed unless they are also labeled. The authority having jurisdiction shall utilize the system employed by the listing organization to identify a listed product.~~

Equipment, materials, products or services included in a list published by an organization acceptable to the code official and concerned with evaluation of products or services that maintains periodic inspection of production of listed equipment or materials or periodic evaluation of services and whose listing states either that the equipment, material, product or service meets identified standards or has been tested and found suitable for a specified purpose.

PART VI – IRC BUILDING/ENERGY

~~**LISTED AND LISTING.** Terms referring to equipment that is shown in a list published by an approved testing agency qualified and equipped for experimental testing and maintaining an adequate periodic inspection of current productions and whose listing states that the equipment complies with nationally recognized standards when installed in accordance with the manufacturer's installation instructions.~~

Equipment, materials, products or services included in a list published by an organization acceptable to the code official and concerned with evaluation of products or services that maintains periodic inspection of production of listed equipment or materials or periodic evaluation of services and whose listing states either that the equipment, material, product or service meets identified standards or has been tested and found suitable for a specified purpose.

Reason: The term “listed” is used in nearly every chapter of the *International Building Code* and throughout the other I-Codes. It is preferred to have such a definition in Chapter 2 of the IBC rather than in Chapter 9. The definition is somewhat revised from the definition currently in IBC Chapter 9, but through a series of proposals, the exact same generic text is being proposed for each of the I-codes where the term is used.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

PART I – IBC GENERAL

Committee Action:

Approved as Submitted

Committee Reason: Defining the term ‘listed’ provides a necessary definition and will add clarity and consistency to the code.

Assembly Action:

None

PART II – IECC

Committee Action:

Approved as Submitted

Committee Reason: This definition for “listed” needs to be the same throughout the I-Codes for purposes of uniform application of the codes for products that need to be listed by an agency.

Assembly Action:

None

PART III – IFC

Committee Action:

Approved as Submitted

Committee Reason: The proposal was approved for consistency with the action taken on code change G16-07/08, Part III.

Assembly Action:

None

PART IV – IFGC

Committee Action:

Approved as Modified

Modify proposal as follows:

LISTED. Equipment, appliances, materials, products or services included in a list published by an organization acceptable to the code official and concerned with evaluation of products or services that maintains periodic inspection of production of listed equipment, appliances or materials or periodic evaluation of services and whose listing states either that the equipment, appliance, material, product or service meets identified standards or has been tested and found suitable for a specified purpose.

Committee Reason: The proposed definition will provide consistent text throughout the codes in the ICC family. The modification adds “appliances” because the IFGC regulates gas appliances which do not fall under the definition of equipment and which are required to be listed and labeled.

Assembly Action:

None

PART V – IMC

Committee Action:

Approved as Modified

Modify the proposal as follows:

LISTED. Equipment, appliances, materials, products or services included in a list published by an organization acceptable to the code official and concerned with evaluation of products or services that maintains periodic inspection of production of listed equipment or materials or periodic evaluation of services and whose listing states either that the equipment, material, product or service meets identified standards or has been tested and found suitable for a specified purpose.

Committee Reason: The definition was simplified to clarify the meaning of a listed item and to delete a requirement that did not belong in a definition. The modification added the term “appliances” back into the definition from the existing language to complete the list of items that can be listed.

Assembly Action:

None

PART VI – IRC-B/E

Committee Action:

Disapproved

Committee Reason: The committee preferred the current language in the code for consistency across the International Codes with respect to the technical definition of the term “listed”.

Assembly Action:

Approved as Submitted

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Bob Eugene, Underwriters Laboratories Inc. requests Approval as Submitted for Part IV.

Commenter-s Reason: Although “appliances” would not be included under the term “equipment”, they would be included under the term “products”, so the definition as submitted is not flawed. Appliances are products that are required to be listed and labeled elsewhere in the code. The definition for “Listed” was approved as Submitted in the International Building Code, International Energy Conservation Code and International Fire Code. For the sake of consistency and user-friendliness, the definition proposed needs to be Approved as Submitted.

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Bob Eugene, Underwriters Laboratories Inc. requests Approval as Submitted for Part V.

Commenter-s Reason: Although “appliances” would not be included under the term “equipment”, they would be included under the term “products”, so the definition as submitted is not flawed. Appliances are products that are required to be listed and labeled elsewhere in the code. The Fuel Gas and Mechanical Committees each modified the definition differently from the submitted definition and from each others modified definitions. The definition of “labeled” as modified by the Mechanical Committee is flawed. The term “appliances” was added only in the first line by the committee, but omitted in the third and fourth lines. The definition for “Listed” was approved as Submitted in the International Building Code, International Energy Conservation Code, and International Fire Code. For the sake of consistency and user-friendliness, the definition proposed needs to be Approved as Submitted.

This item is on the agenda for individual consideration because an assembly action was successful and a public comment was submitted.

Public Comment:

Bob Eugene, Underwriters Laboratories Inc. requests Approval as Submitted for Part VI.

Commenter-s Reason: The definition as submitted expands the definition beyond “equipment.” Products other than “equipment” are required to be listed and labeled elsewhere in the code. The definition for “Listed” was approved as Submitted in the International Building Code, International Energy Conservation Code, and International Fire Code. The Fuel Gas and Mechanical Committees each modified the definition differently from the submitted definition and from each others modified definitions. For the sake of consistency and user-friendliness, the definition proposed needs to be Approved as Submitted.

Final Hearing Results

G17-07/08, Part I	AS
G17-07/08, Part II	AS
G17-07/08, Part III	AS
G17-07/08, Part IV	AS
G17-07/08, Part V	AS
G17-07/08, Part VI	AS

Code Change No: G23-07/08

Original Proposal

Sections: 304.1, 202 (New) [IFC [B] 202 (New)], 421 (New); IFC 903.2.2 (New) [IBC [F] 903.2.2 (New)], 907.2.2 (IBC [F] 907.2.2)

Proponent: John Williams, State of Washington Department of Health, Construction Review Services, WA

THESE PROPOSALS ARE ON THE AGENDA OF THE IBC GENERAL AND IFC CODE DEVELOPMENT COMMITTEES AS 2 SEPARATE CODE CHANGES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IBC GENERAL

1. Revise as follows:

304.1 (IFC [B] 202) Business Group B. Business Group B occupancy includes, among others, the use of a building or structure, or a portion thereof, for office, professional or service-type transactions, including storage of records and accounts. Business occupancies shall include, but not be limited to, the following:

- Airport traffic control towers
- Ambulatory health care facilities (see section 421)
- Animal hospitals, kennels and pounds
- Banks
- Barber and beauty shops
- Car wash
- Civic administration
- Clinic—outpatient
- Dry cleaning and laundries: pick-up and delivery stations and self-service
- Educational occupancies for students above the 12th grade
- Electronic data processing
- Laboratories: testing and research
- Motor vehicle showrooms
- Post offices
- Print shops
- Professional services (architects, attorneys, dentists, physicians, engineers, etc.)
- Radio and television stations
- Telephone exchanges
- Training and skill development not within a school or academic program

2. Add new definition as follows:

SECTION 202 (IFC 202) DEFINITIONS

AMBULATORY HEALTH CARE FACILITY. Buildings or portions thereof used to provide medical, surgical, psychiatric, nursing or similar care on a less than 24-hour basis to individuals who are rendered incapable of self-preservation.

3. Add new text as follows:

SECTION 421 AMBULATORY CARE FACILITIES

421.1 General. Occupancies classified as Group B Ambulatory Health Care Facilities shall comply with the provisions of this section and other applicable provisions of this code.

421.2 Smoke barriers. Smoke barriers shall be provided to subdivide every ambulatory care facility greater than 10,000 square feet (929 m²) into a minimum of two smoke compartments. The travel distance from any point in a smoke compartment to a smoke barrier door shall not exceed 200 feet (60 960 mm). The smoke barrier shall be installed in accordance with Section 709.

421.3 Refuge area. At least 30 net square feet (2.8 m²) per nonambulatory patient shall be provided within the aggregate area of corridors, patient rooms, treatment rooms, lounge or dining areas and other low-hazard areas on each side of each smoke barrier.

421.4 Independent egress. A means of egress shall be provided from each smoke compartment created by smoke barriers without having to return through the smoke compartment from which means of egress originated.

421.5 Automatic Sprinkler Systems. Automatic sprinklers systems shall be provided for ambulatory care facilities in accordance with Section 903.2.2.

421.6 Fire alarm systems. A fire alarm system shall be provided in accordance with Section 907.2.2.

PART II – IFC

1. Add new text as follows:

903.2.2 (IBC [F] 903.2.2) Group B ambulatory health care facilities. An automatic sprinkler system shall be provided for Group B Ambulatory Health Care Facility occupancies when either of the following conditions are met:

1. Four or more care recipients are incapable of self preservation at any given time
2. One or more care recipients that are incapable of self preservation are located at other than the level of exit discharge.

(Renumber subsequent sections)

2. Revise as follows:

907.2.2 (IBC [F] 907.2.2) (Supp) Group B. A manual fire alarm system that activates the occupant notification system in accordance with Section 907.6 shall be installed in Group B occupancies where one of the following conditions exists:

1. The combined Group B occupant load of all floors is 500 or more.
2. The Group B occupant load is more than 100 persons above or below the lowest level of exit discharge.

Exception: Manual fire alarm boxes are not required where the building is equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 and the occupant notification appliances will activate throughout the notification zones upon sprinkler water flow.

A manual and automatic fire alarm system shall be installed in all Group B Ambulatory Health Care Facilities.

Reason: This code change is intended to address the issue of ambulatory surgery centers. Thirty years ago, few surgical procedures were performed outside of the hospital. Today, complex outpatient surgeries outside of the hospital are commonplace. They are performed in facilities often called “day surgery centers” or “Ambulatory surgical centers (ASC’s)” because patients are able to walk in and walk out the same day. Procedures render patients temporarily incapable of self-preservation by application of nerve blocks, sedation, or anesthesia. Patients in these facilities typically recover quickly.

The IBC identifies the healthcare Group I occupancies as having 24 hour stay. Without 24 stay these surgery centers are being classified as Group B. Essentially this allows you to render an unlimited number of people incapable of self preservation with no more protection than a business office. Since there is no distinct classification for ASC’s in the I codes, the total number of these facilities cannot be quantified. These types of facilities contain distinctly different hazards to life and safety than other Business Occupancies, such as:

- Patients incapable of self-preservation require rescue by other occupants or fire personnel.
- Medical staff must stabilize the patient prior to evacuation; therefore, staff may require evacuation as well.
- Use of oxidizing medical gases such oxygen and nitrous oxide
- Prevalence of surgical fires.

Past changes have tried to force these occupancies into the Group I-2 category. This is a poor fit, because these are not hospitals. Other Federal and State jurisdictions have recognized that there is a middle ground somewhere in between Group B and I-2. This proposal provides a scaled approach to protection. Occupancy classification stays as group B. A fire alarm is required in all facilities for increased staff awareness. A sprinkler is required when several people are incapable of self preservation. In larger facilities, a smoke compartment is provided to allow more of a protect in place environment. These allow staff a safer environment to stabilize the patients before evacuation, and protection for fire personnel who may have to evacuate both patients and staff.

An ICC CTC study group was formed last year to examine these facilities and determine what if any changes to the code are necessary. Unfortunately, scheduling did not allow enough time for the study group to complete a proposal for a code change. Hundreds of these facilities are being built every year, and those are the ones that we know about. Please do not wait until 2012 to provide a safer environment for this very sensitive population of patients.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

PART I – IBC GENERAL

Committee Action:

Approved as Modified

Modify the proposal as follows:

304.1 (IFC [B] 202) Business Group B. Business Group B occupancy includes, among others, the use of a building or structure, or a portion thereof, for office, professional or service-type transactions, including storage of records and accounts. Business occupancies shall include, but not be limited to, the following:

- Airport traffic control towers
- Ambulatory health care facilities (~~see section 421~~)
- Animal hospitals, kennels and pounds
- Banks
- Barber and beauty shops
- Car wash
- Civic administration
- Clinic—outpatient
- Dry cleaning and laundries: pick-up and delivery stations and self-service
- Educational occupancies for students above the 12th grade
- Electronic data processing
- Laboratories: testing and research
- Motor vehicle showrooms
- Post offices
- Print shops
- Professional services (architects, attorneys, dentists, physicians, engineers, etc.)
- Radio and television stations
- Telephone exchanges
- Training and skill development not within a school or academic program

421.2 Smoke barriers. Smoke barriers shall be provided to subdivide every ambulatory care facility greater than 10,000 square feet (929 m²) into a minimum of two smoke compartments per story. The travel distance from any point in a smoke compartment to a smoke barrier door shall not exceed 200 feet (60 960 mm). The smoke barrier shall be installed in accordance with Section 709.

(Portions of proposal not shown remain unchanged)

Committee Reason: The proposal was felt to comprehensively address the issue of surgery centers that are not classified as Group I occupancies but need increased regulation based upon the conditions of the people being treated at these facilities. There were two modifications made. The first was simply an editorial revision to remove an unnecessary reference in the occupancy classifications to the new Section 421. The second clarifies that each story needs to be divided into at least 2 smoke compartments. This addresses multiple story facilities. The committee also felt that an issue to be addressed during public comment would be the threshold number of patients that classify an occupancy as an ambulatory health care facility.

Assembly Action:

None

PART II – IFC

Committee Action:

Approved as Modified

Modify the proposal as follows:

903.2.2 (IBC [F] 903.2.2) Group B ambulatory health care facilities. An automatic sprinkler system shall be ~~provided for~~ installed throughout all fire areas containing a Group B Ambulatory Health Care Facility occupancies when either of the following conditions are met exist at any given time:

1. Four or more care recipients are ~~rendered~~ incapable of self preservation ~~at any given time~~
2. One or more care recipients that are incapable of self preservation are located at other than the level of exit discharge.

[F] 907.2.2 Group B. A manual fire alarm system ~~that activates the occupant notification system in accordance with Section 907.6~~ shall be installed in Group B occupancies where one of the following conditions exists:

1. The combined Group B occupant load of all floors is 500 or more.
2. The Group B occupant load is more than 100 persons above or below the lowest level of exit discharge.
3. Fire areas containing a Group B occupancy classified as an ambulatory health care facility

CODE CHANGES RESOURCE COLLECTION – INTERNATIONAL BUILDING CODE

Exception: Manual fire alarm boxes are not required where the building is equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 and the occupant notification appliances will activate throughout the notification zones upon sprinkler water flow.

~~A manual and automatic fire alarm system shall be installed in all Group B ambulatory health care facilities.~~

[F] 907.2.2.2 Group B - Ambulatory health care facilities. Fire areas containing ambulatory health care facilities shall be provided with an electrically supervised automatic smoke detection system installed within the ambulatory health care facility and in public use areas outside of tenant spaces, including public corridors and elevator lobbies.

Exception: Buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 provided the occupant notification appliances will activate throughout the notification zones upon sprinkler water flow.

Committee Reason: The committee agreed that the proponent's reason statement accurately and adequately substantiates the need for the change. This code change represents a co-operative effort of concerned parties through the ICC Code Technology Committee's Care Study Group to resolve a long-standing problem in how the code deals with the subject facilities. This also correlates with the action taken by the IBC-G Committee in Part I. The modification represents additional consensus on the level of protection that should be afforded these facilities.

Assembly Action:

None

Final Hearing Results

G23-07/08, Part I	AM
G23-07/08, Part II	AM

Code Change No: G24-07/08

Original Proposal

Sections: 304.1.1 (IFC [B] 202)

Proponent: Roger Severson, RSA Consulting, representing the Oregon Department of Health Services

Add new text as follows:

304.1.1 (IFC [B] 202) Definitions. The following words and terms shall, for the purposes of this section and as used elsewhere in this code, have the meanings shown herein.

CLINIC-OUTPATIENT. A medical office or facility serving patients who are capable of self-preservation, or where not more than three patients are rendered incapable of self-preservation and the facility is on the level of exit discharge. Facilities with four or more patients who are rendered incapable of self-preservation or where one or more patients that are incapable of self preservation are located at other than the level of exit discharge are Ambulatory Health Care Facilities (see Section 421.)

Reason: This code change is intended to be submitted in collaboration with the state of Washington to correlate with their new proposal in Section 421 for Ambulatory Health Care Facilities. Oregon, as well as other states, have made modifications to areas of the code affected by Clinic-outpatient facilities. These modifications and national certification requirements recognize that there are additional levels of protection required where patients are not capable of caring for them self. Finding common ground and putting these modifications into the model code would provide greater consistency across the country.

The amendment in Section 304.1 simply limits the number of patients who are not capable of self-preservation to three or fewer by adding a definition. There is also a reference that sends the reader to Section 421 for facilities that provide service to more than three patients incapable of self preservation.

Cost Impact: For facilities abiding by the requirements for federal funding, or for those areas who are modifying the code in a similar respect, the code change proposal will not increase the cost of construction.

However, for areas where outpatient clinics are allowed to provide services that would render patients incapable of self-preservation and be classified as a B occupancy, there would be an increase to the cost of construction.

Additionally, when a facility is not built to the standards required to receive federal funding, and they would then choose to become certified later, another additional cost could be imposed upon the facility.

Analysis: Note that the Section 421 that is referenced in this definition is a new section proposed in code change proposal Williams G23-07/08.

Public Hearing Results

Committee Action:**Approved as Modified****Modify the proposal as follows:**

304.1.1 (IFC [B] 202) Definitions. The following words and terms shall, for the purposes of this section and as used elsewhere in this code, have the meanings shown herein.

CLINIC-OUTPATIENT. ~~A medical office or facility serving patients who are capable of self-preservation, or where not more than three patients are rendered incapable of self-preservation and the facility is on the level of exit discharge. Facilities with four or more patients who are rendered incapable of self-preservation or where one or more patients that are incapable of self-preservation are located at other than the level of exit discharge are Ambulatory Health Care Facilities (see Section 421.) Buildings or portions thereof used to provide medical care on less than a 24-hour basis to individuals who are not rendered incapable of self-preservation by the services provided.~~

Committee Reason: The definition clarifies the difference between ambulatory surgery centers as addressed in G23-07/08 and doctors offices. The modification is simply to correlate more closely with G23-07/08.

Assembly Action:**None**

Final Hearing Results

G24-07/08

AM

Code Change No: G25-07/08

Original Proposal

Sections: 306.2 (IFC [B] 202), 311.2 (IFC 202.1), 311.3 (IFC 202.1), 421.2.1(New), [F] 412.2.6 (IFC 914.8.2), Table [F] 421.2.6 (IFC Table 914.8.2) (New), [F] 412.2.6.1 (IFC 914.8.2.1) (New), [F] 412.2.6.2 (IFC 914.8.2.2) (New)

Proponent: Tom Lariviere, Fire Department, Madison, MS, representing the Joint Fire Service Review Committee

THESE PROPOSALS ARE ON THE AGENDA OF THE IBC GENERAL AND IFC CODE DEVELOPMENT COMMITTEES AS 2 SEPARATE CODE CHANGES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IBC GENERAL**Revise as follows:**

306.2 (IFC 202) Factory Industrial F-1 Moderate-hazard Occupancy. Factory industrial uses which are not classified as Factory Industrial F-2 Low Hazard shall be classified as F-1 Moderate Hazard and shall include, but not be limited to, the following:

- Aircraft (manufacturing, not to include repair)
- Appliances
- Athletic equipment
- Automobiles and other motor vehicles
- Bakeries
- Beverages; over 12-percent alcohol content
- Bicycles
- Boats
- Brooms or brushes
- Business machines
- Cameras and photo equipment

Canvas or similar fabric
Carpets and rugs (includes cleaning)
Clothing
Construction and agricultural machinery
Disinfectants
Dry cleaning and dyeing
Electric generation plants
Electronics
Engines (including rebuilding)
Food processing
Furniture
Hemp products
Jute products
Laundries
Leather products
Machinery
Metals
Millwork (sash & door)
Motion pictures and television filming (without spectators)
Musical instruments
Optical goods
Paper mills or products
Photographic film
Plastic products
Printing or publishing
Refuse incineration
Shoes
Soaps and detergents
Textiles
Tobacco
Trailers
Upholstering
Wood; distillation
Woodworking (cabinet)

311.2 (IFC 202) Moderate-hazard storage, Group S-1. Buildings occupied for storage uses that are not classified as Group S-2, including, but not limited to, storage of the following:

Aerosols, Levels 2 and 3
Aircraft repair hangar
Bags: cloth, burlap and paper
Bamboos and rattan
Baskets
Belting: canvas and leather
Books and paper in rolls or packs
Boots and shoes
Buttons, including cloth covered, pearl or bone
Cardboard and cardboard boxes
Clothing, woolen wearing apparel
Cordage
Dry boat storage (indoor)
Furniture
Furs
Glues, mucilage, pastes and size
Grains
Horns and combs, other than celluloid
Leather
Linoleum
Lumber

Motor vehicle repair garages complying with the maximum allowable quantities of hazardous materials listed in Table 307.1(1) (see Section 406.6)
 Photo engravings
 Resilient flooring
 Silks
 Soaps
 Sugar
 Tires, bulk storage of
 Tobacco, cigars, cigarettes and snuff
 Upholstery and mattresses
 Wax candles

311.3 (IFC 202) Low-hazard storage, Group S-2. Includes, among others, buildings used for the storage of noncombustible materials such as products on wood pallets or in paper cartons with or without single thickness divisions; or in paper wrappings. Such products are permitted to have a negligible amount of plastic trim, such as knobs, handles or film wrapping. Storage uses shall include, but not be limited to, storage of the following:

~~Aircraft hangar~~
 Asbestos
 Beverages up to and including 12-percent alcohol in metal, glass or ceramic containers
 Cement in bags
 Chalk and crayons
 Dairy products in nonwaxed coated paper containers
 Dry cell batteries
 Electrical coils
 Electrical motors
 Empty cans
 Food products
 Foods in noncombustible containers
 Fresh fruits and vegetables in nonplastic trays or containers
 Frozen foods
 Glass
 Glass bottles, empty or filled with noncombustible liquids
 Gypsum board
 Inert pigments
 Ivory
 Meats
 Metal cabinets
 Metal desks with plastic tops and trim
 Metal parts
 Metals
 Mirrors
 Oil-filled and other types of distribution transformers
 Parking garages, open or enclosed
 Porcelain and pottery
 Stoves
 Talc and soapstones
 Washers and dryers

PART II – IFC

1. Revise as follows:

[F] 412.2.6 (IFC 914.8.2) Fire suppression. Aircraft hangars shall be provided with a fire suppression system designed in accordance with as required by NFPA 409, based upon the classification for the hangar given in Table 412.2.6.

Exception: When a Fixed Base Operator has separate repair facilities on site, Group II hangars operated by a Fixed Base Operator used for storage of transient aircraft only, as defined in NFPA 409, storing private aircraft without major maintenance or overhaul are shall have a fire suppression system, but the system is exempt from foam suppression requirements.

2. Add new table and text as follows:

**[F] TABLE 412.2.6 (IFC TABLE 914.8.2)
HANGAR FIRE SUPPRESSION REQUIREMENTS^{a,b}**

Maximum Single Fire Area, sq. ft. (m ²)	Type of Construction								
	IA	IB	IIA	IIB	IIIA	IIIB	IV	VA	VB
>40,001 (3,716)	Group I	Group I	Group I	Group I	Group I	Group I	Group I	Group I	Group I
40,000 (3,716)	Group II	Group II	Group II	Group II	Group II	Group II	Group II	Group II	Group II
30,000 (2,787)	Group III	Group II							
20,000 (1,858)	Group III	Group III	Group II						
15,000 (1,394)	Group III	Group III	Group III	Group II	Group III	Group II	Group III	Group II	Group II
12,000 (1,115)	Group III	Group III	Group III	Group III	Group III	Group III	Group III	Group II	Group II
8,000 (743)	Group III	Group III	Group III	Group III	Group III	Group III	Group III	Group III	Group II
5,000 (465)	Group III	Group III	Group III	Group III	Group III	Group III	Group III	Group III	Group III

- a. Aircraft hangars with a door height greater than 28 feet shall be provided with fire suppression for a Group I hangar regardless of maximum fire area.
- b. Groups shall be as classified in accordance with NFPA 409.

[F] 412.2.6.1 (IFC 914.8.2.1) Hazardous Operations. Any Group III aircraft hangar according to Table 914.8.2 that contains hazardous operations including, but not limited to, the following shall be provided with a Group I or Group II fire suppression system in accordance with NFPA 409 as applicable:

1. Doping.
2. Hot work including, but not limited to welding, torch cutting, and torch soldering.
3. Fuel transfer.
4. Fuel tank repair or maintenance not including de-fueled tanks per NFPA 409, inerted tanks or tanks that have never been fueled.
5. Spray finishing operations.
6. Total fuel capacity of all aircraft within the non-sprinklered single fire area in excess of 1,600 gal (6057 L).
7. Total fuel capacity of all aircraft within the maximum single fire area in excess of 7,500 gal (28,390 L) for a hangar with a fire sprinkler system per Section 903.3.1.1.

[F] 412.2.6.2 (IFC 914.8.2.2) Separation of maximum single fire areas. Maximum single fire areas established in accordance with hangar classification and construction type in Table 914.8.2 shall be separated by 2 hour fire walls constructed in accordance with Section 705.

412.2.1 DEFINITIONS. The following word and term shall, for the purposes of this chapter and as used elsewhere in this code, have the meaning shown herein.

FIXED BASE OPERATOR (FBO). A commercial business granted the right by the airport sponsor to operate on an airport and provide aeronautical services such as fueling, hangaring, tie-down and parking, aircraft rental, aircraft maintenance, and flight instruction.

TRANSIENT AIRCRAFT. Aircraft based at another location and is at the transient location for not more than 90 days.

Reason: The current fire suppression requirements found in the IBC and IFC for aircraft hangars are confusing at best. The IBC and IFC require: "Aircraft hangars shall be provided with fire suppression as required by NFPA 409." Neither the IBC nor the IFC gives any guidance when going to NFPA 409 on how to use that standard. In addition, the exception to the fire suppression requirements uses two terms that have no definition. Those terms are: "private aircraft" and "major maintenance or overhaul."

"Private aircraft" is difficult to define. For example, is a Cessna 210 owned by a corporation a private aircraft or the Gulfstream V (which carries over 6,700 gallons of fuel and has a range of that similar to a 737) owned by a celebrity a private aircraft? The FAA does not define aircraft this way and the reference to "private aircraft" is confusing and difficult to enforce and administer.

"Major maintenance or overhaul" is another term that is difficult to define. The FAA cannot even define "major maintenance" in a way intended by the IBC and IFC. The FAA has a document that all aircraft owners and operators have. It is CFR Part 43 Appendix A. There is no definitive list in this document that the code official can use when determining the extent of maintenance in an aircraft hangar. In addition, NFPA 409 makes no mention of "maintenance" for any of its requirements except for certain "hazardous operations" in Group III hangars.

This proposal will eliminate these two terms because they are difficult to define and they are not necessary when determining the fire suppression requirements from NFPA 409. There is an exception for the foam requirements in the IBC and IFC that use these terms. The exception to 914.8.2 is intended for those aircraft hangars that Flight Base Operators (FBO) use for visiting aircraft to an airport. The FBO will have other repair facilities on the airport and the "storage" hangar is intended for short-term storage only inside a hangar from the weather.

In place of the "private aircraft" and "major maintenance" terms, this proposal adds the term "transient aircraft." This better identifies the intent of this type of aircraft hangar. It seems that most frequently, the owner that wants to develop an aircraft hangar that fits the Group II category, will do no "major maintenance" and will only "store" airplanes in their hangar. This becomes a significant enforcement issue after the hangar is built and occupied, as everyone will then only be doing minor repair even though the aircraft engine is in pieces or a wing is lying on the floor of the hangar. NFPA 409 does not use "maintenance" as a criterion to determine the fire suppression requirements for any aircraft hangars except for Group III hangars where certain "hazardous" operations are conducted. Even then, if those "hazardous" operations are done, the group type of the hangar goes from a Group III hangar to a Group II.

The other aspect of maintenance that the IBC and IFC ignore is that of the maintenance of "experimental" aircraft. The experimental aircraft owner will always maintain and repair his or her aircraft as an FAA mechanic "will not" work on an experimental aircraft. An FAA mechanic cannot work on an experimental aircraft because there is no "service manual" for the aircraft like there is for a factory built aircraft. On every airport in the country where there are T-hangars, one will find experimental aircraft. As the codes currently read, this then becomes an enforcement problem requiring the code official to monitor maintenance in the T-hangars, which is not the intent of NFPA 409. NFPA 409 intends that maintenance be done in the small hangars just like in the large hangars.

Because repair is intended in NFPA 409 in aircraft hangars, this proposal eliminates the S-2 occupancy classification for "storage" aircraft hangars. The S-2 occupancy classification is confusing to the designer and code official and serves no purpose. The S-1 occupancy classification is all that is needed. When one looks at NFPA 409 to determine the fire suppression requirements, one will find that the Group III hangars have no fire suppression requirements except for during certain hazardous operations. NFPA 409 recognizes that in these small aircraft hangars there will be repair operations and has determined that fire suppression is not required due to the small size of the aircraft hangars. As the IBC and IFC are currently worded, if a designer were to select the S-2 occupancy classification, that hangar could not contain any repair operations. This does a disservice to the hangar owner and anyone who may lease or rent an aircraft space in that hangar. A Group III hangar could be as large as 12,000 square feet in area with Type IIB construction without any fire suppression systems and NFPA 409 would allow repair activities in that aircraft hangar.

NFPA 409 also limits the size of the small hangars with the definitions of a "single hangar building" and the "cluster hangar" for Group III aircraft hangars. These two definitions limit the size and location separations of these two types of hangars, which is part of the fire suppression scheme for Group III hangars. NFPA handles the lack of required separation of hangar buildings by requiring two two-hour walls on each hangar building. This seems to be like a "fire wall" as defined by IBC Section 705. This proposal thus adds this requirement for separation of single hangar buildings with a fire wall as defined by IBC Section 705 in lieu of the NFPA 409 requirement of two 2-hour walls.

NFPA 409 specifies fire protection for aircraft hangars based on Group I, Group II or Group III hangar, but the IBC and IFC do not define aircraft hangars using these terms. This proposal adds a table that coordinates the IBC/IFC terms and construction requirements with the fire protection design requirements found in NFPA 409 for Group I, II and III hangars. This table is based on correlating the NFPA construction and area limits with the IBC and IFC construction requirements. This table combines several tables in NFPA 409 into a single table that allows determination of the group type for aircraft hangars based on construction type and area before proceeding to NFPA 409 for the suppression requirements.

This proposal will simplify the current IBC and IFC requirements for aircraft hangars and make the codes easier to use by both the aircraft hangar designer and the code official.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

PART I – IBC GENERAL Committee Action:

Approved as Modified

Modify proposal as follows:

311.2 (IFC 202) Moderate-hazard storage, Group S-1. Buildings occupied for storage uses that are not classified as Group S-2, including, but not limited to, storage of the following:

- Aerosols, Levels 2 and 3
- Aircraft hangar (storage and repair)
- Bags: cloth, burlap and paper
- Bamboos and rattan
- Baskets
- Belting: canvas and leather
- Books and paper in rolls or packs
- Boots and shoes
- Buttons, including cloth covered, pearl or bone
- Cardboard and cardboard boxes
- Clothing, woolen wearing apparel
- Cordage
- Dry boat storage (indoor)
- Furniture
- Furs
- Glues, mucilage, pastes and size
- Grains
- Horns and combs, other than celluloid
- Leather
- Linoleum
- Lumber

CODE CHANGES RESOURCE COLLECTION – INTERNATIONAL BUILDING CODE

Motor vehicle repair garages complying with the maximum allowable quantities of hazardous materials listed in Table 307.1(1) (see Section 406.6)
Photo engravings
Resilient flooring
Silks
Soaps
Sugar
Tires, bulk storage of
Tobacco, cigars, cigarettes and snuff
Upholstery and mattresses
Wax candles

(Portions of proposal not shown remain unchanged)

Committee Reason: The proposal was approved as it was felt that Group S1 is a more appropriate classification and that a Group H classification would be too limiting. The modification clarifies that repairs can occur in Group S-1 occupancies which as originally written would have been unclear.

Assembly Action: **None**

PART II – IFC

Committee Action: **Approved as Modified**

Modify the proposal as follows:

**[F] TABLE 412.2.6 (IFC TABLE 914.8.2)
HANGAR FIRE SUPPRESSION REQUIREMENTS^{a,b,c}**

(No change to table contents)

- a. Aircraft hangars with a door height greater than 28 feet shall be provided with fire suppression for a Group I hangar regardless of maximum fire area.
- b. Groups shall be as classified in accordance with NFPA 409.
- c. Membrane structures complying with Section 3102 of the *International Building Code* shall be classified as a Group IV hangar.

(Portions of proposal not shown remain unchanged)

Committee Reason: The committee agreed that the proponent's reason statement accurately and adequately substantiates the need for the change. This code change represents a comprehensive effort to resolve a long-standing problem in how to apply the provisions of NFPA 409 as referenced without creating conflict with the construction requirements of the IBC. This also correlates with the action taken by the IBC-G Committee in Part I. The modification provides additional guidance on the appropriate treatment of membrane structures which are often used to shelter aircraft.

Assembly Action: **None**

Final Hearing Results

G25-07/08, Part I **AM**
G25-07/08, Part II **AM**

Code Change No: G26-07/08

Original Proposal

Sections: 306.2, 306.3, 311.3 (IFC [B] 202)

Proponent: Gary L. Rencehausen, Lewiston, ID, representing himself

1. Revise as follows:

306.2 (IFC [B] 202) Factory Industrial F-1 Moderate-hazard Occupancy. Factory industrial uses which are not classified as Factory Industrial F-2 Low Hazard shall be classified as F-1 Moderate Hazard and shall include, but not be limited to, the following:

Aircraft
Appliances
Athletic equipment
Automobiles and other motor vehicles
Bakeries
Beverages; over ~~42-~~ 16-percent alcohol content
Bicycles
Boats
Brooms or brushes
Business machines
Cameras and photo equipment
Canvas or similar fabric
Carpets and rugs (includes cleaning)
Clothing
Construction and agricultural machinery
Disinfectants
Dry cleaning and dyeing
Electric generation plants
Electronics
Engines (including rebuilding)
Food processing
Furniture
Hemp products
Jute products
Laundries
Leather products
Machinery
Metals
Millwork (sash & door)
Motion pictures and television filming (without spectators)
Musical instruments
Optical goods
Paper mills or products
Photographic film
Plastic products
Printing or publishing
Recreational vehicles
Refuse incineration
Shoes
Soaps and detergents
Textiles
Tobacco
Trailers
Upholstering
Wood; distillation
Woodworking (cabinet)

306.3 (IFC [B] 202) Factory Industrial F-2 Low-hazard Occupancy. Factory industrial uses that involve the fabrication or manufacturing of noncombustible materials which during finishing, packing or processing do not involve a significant fire hazard shall be classified as F-2 occupancies and shall include, but not be limited to, the following:

Beverages; up to and including ~~42-~~ 16-percent alcohol content
Brick and masonry
Ceramic products
Foundries
Glass products
Gypsum
Ice
Metal products (fabrication and assembly)

311.3 (IFC [B] 202) Low-hazard storage, Group S-2. Includes, among others, buildings used for the storage of noncombustible materials such as products on wood pallets or in paper cartons with or without single thickness divisions; or in paper wrappings. Such products are permitted to have a negligible amount of plastic trim, such as knobs, handles or film wrapping. Storage uses shall include, but not be limited to, storage of the following:

- Aircraft hangar
- Asbestos
- Beverages up to and including ~~42-~~ 16-percent alcohol in metal, glass or ceramic containers
- Cement in bags
- Chalk and crayons
- Dairy products in nonwaxed coated paper containers
- Dry cell batteries
- Electrical coils
- Electrical motors
- Empty cans
- Food products
- Foods in noncombustible containers
- Fresh fruits and vegetables in nonplastic trays or containers
- Frozen foods
- Glass
- Glass bottles, empty or filled with noncombustible liquids
- Gypsum board
- Inert pigments
- Ivory
- Meats
- Metal cabinets
- Metal desks with plastic tops and trim
- Metal parts
- Metals
- Mirrors
- Oil-filled and other types of distribution transformers
- Parking garages, open or enclosed
- Porcelain and pottery
- Stoves
- Talc and soapstones
- Washers and dryers

Reason: I am proposing a change and an alternative, and I will try and explain both.

I am part owner in a small startup winery and we are hoping to relocate into part of an older existing downtown building. For us getting the code change would allow us to build a 2 hour fire wall, opposed to a 3 hour fire wall required by the F-1, moderate hazard class for liquids 12% alcohol and above.

The 12% was a relatively arbitrary number. I spoke with William Stuart the architect who submitted the change to allow up to 12% from the 0% that it was prior to 2000. He stated that not being a avid wine drinker he had simply reached in to the cupboard and pulled out a bottle of Gallo and it listed it's alcohol at 12% and that was what he used as his standard. If his intent was to allow the production and storage of wine in the F-2 class then for the most part he failed...

In my opinion there are two other logical choices for an alcohol % limit. Twenty percent alcohol would be the first choice with 16% being the alternate. I will try to explain both. I don't know how familiar the code council is with the making of wine so I will include a very brief description of the process. In a juice adding a yeast will turn the natural sugar into alcohol. It is a self limiting process, in that most common wine yeast will die off as the alcohol raises to between 12 and 16.% (depending mostly on the type of yeast). A good dry red wine will often finish at 14 to 15 %. (And it may be a little higher at some point during the process) To reach a higher alcohol % the wine needs to be fortified by adding alcohol. Such is the case of Port style wines where brandy is added to bring the alcohol up 18 -20% which is the usual upper limit of fortified wines. I hope that explains my justification for the two higher limit proposals.

From the chart included (Flash Points of Ethanol based Water Solutions) you can see if you extrapolate 15% would be about 120 degrees F. Now it is possible that during the fermentation process the must (the juice, skin and seed solution) might approach 95 to 100 degrees F. This would typically be near the mid point of the fermentation cycle when the alcohol would be in the 8-10% range. As the process continues and must (wine) reaches the 15 % level the fermentation slows down and the temp drops to room temp (65 to 70 degrees F). Were the wine then to be fortified it is here at this temp that alcohol would be added. I might also add here that another byproduct of the fermentation process is the production of CO2 and being heavier than air it floats on top of the fermentation vats. CO2 will not support combustion, in fact one method of checking to insure the fermentation process is still working is to hold a match over the vat, as soon as the match drops below the rim of the vat it goes out.

In conclusion I have added a couple of letters that give a little insight into how an alcohol/water solution is classified as a waste product. It doesn't appear that raising the limit to 16 or 20 % significantly raises the risks in the production of wine. The 16 or 20 % alcohol is still less than the ignitability of wine with the temperatures we see in the production of wine.

I think that raising the limit would not only open up some possibilities for other wineries but also for other downtown areas where a winery might well help in their revitalization.

Cost Impact: The code change proposal will actually decrease the cost of construction.

Public Hearing Results

Committee Action:**Disapproved**

Committee Reason: Other types of beverages beyond simply wine were not addressed in the reason and the flashpoint data was not provided as noted in the reason. The committee had concerns as to how other alcohol would relate to this new classification in terms of possible unnecessary hazards posed.

Assembly Action:**None**

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because public comments were submitted.

Public Comment 1:

Gary L. Rencehausen, Lewiston, ID, representing himself requests Approval as Submitted.

Commenter-s Reason: I'm not sure how to address "other types of beverages" I would say though that simple wine would include 99 + % of the production of beverages that fall into the category of the 12 to 16 % that I'm trying to change.

Flashpoint data of ethanol based water solutions from EngineeringToolBox.com are: 135 deg. for 10% solution and 105 deg. for 20% solution this gives approximately 129 deg and 117 deg for 12 and 16 % respectively. Given that the ideal storage temp for wines is below 60 deg. and in manufacturing it is unlikely to exceed 85 deg. this seems a safe margin. The term Flashpoint brings to mind images of exploding barrels of wine. This is unlikely to happen, and it does not mean that you can heat a container of wine to 140 degrees or more and toss in a match and it will burn. It is theoretically possible that if you had a closed container half full of wine and heated it up you could collect enough alcohol to flash if a flame was introduced, but it would not burn. Barrels and tanks are kept full (air is not good to wine) so there is no room to collect vaporizing alcohol. Even in an open container the vaporizing alcohol is most likely to dissipate and dilute in the air before it would flash. This proposal is a reasonable and prudent change with a minimum risks to life and health safety issues.

Public Comment 2:

Maureen Traxler, City of Seattle Department of Planning and Development, requests Approval as Submitted.

Commenter-s Reason: This is a modest proposal that would ease an unnecessarily restrictive provision. It changes the threshold at which beverages are classified as F-1 or S-1 from 12% to 16% alcohol content. There is very little fire hazard from beverages with alcohol content this low.

This change would only affect regular wines. The highest alcohol content in unfortified wines is found in premium red wines which have alcohol content under 15%. Fortified and port-style wines have a higher alcohol content because brandy or other distilled beverages have been added to them. Brandy is distilled wine with an alcohol content of 40% or more, similar to whiskey.

G27-07/08, which raises the alcohol content to 20%, would include fortified wines. We encourage disapproval of G27, not because of the wine, but because of the amount of higher-alcohol content liquids that are present during the production of fortified wines.

Final Hearing Results

G26-07/08**AS**

Code Change No: **G28-07/08**

Original Proposal

Sections: [F] 307.1 (IFC 202)

Proponent: Robert J Davidson, Davidson Code Concepts, LLC, representing himself

THIS PROPOSAL IS ON THE AGENDA OF THE IFC CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IFC CODE DEVELOPMENT COMMITTEE.

Revise as follows:

[F] 307.1 (IFC 202) (Supp) High-hazard Group H. High-hazard Group H occupancy includes, among others the use of a building or structure, or a portion thereof, that involves the manufacturing, processing, generation or storage of materials that constitute a physical or health hazard in quantities in excess of those allowed in control areas complying with Section 414, based on the maximum allowable quantity limits for control areas set forth in Tables 307.1(1) and 307.1(2). Hazardous occupancies are classified in Groups H-1, H-2, H-3, H-4 and H-5 and shall be in accordance with this section, the requirements of Section 415 and the *International Fire Code*.

Exceptions: The following shall not be classified as Group H, but shall be classified as the occupancy that they most nearly resemble.

1. Buildings and structures occupied for the application of flammable finishes, provided that such buildings or areas conform to the requirements of Section 416 and the *International Fire Code*.
2. Wholesale and retail sales and storage of flammable and combustible liquids in mercantile occupancies conforming to the *International Fire Code*.
3. Closed piping system containing flammable or combustible liquids or gases utilized for the operation of machinery or equipment.
4. Cleaning establishments that utilize combustible liquid solvents having a flash point of 140°F (60°C) or higher in closed systems employing equipment listed by an approved testing agency, provided that this occupancy is separated from all other areas of the building by 1-hour fire barriers or 1-hour horizontal assemblies or both.
5. Cleaning establishments that utilize a liquid solvent having a flash point at or above 200°F (93°C).
6. Liquor stores and distributors without bulk storage.
7. Refrigeration systems.
8. The storage or utilization of materials for agricultural purposes on the premises.
9. Stationary batteries utilized for facility emergency power, uninterrupted power supply or telecommunication facilities, provided that the batteries are provided with safety venting caps and ventilation is provided in accordance with the *International Mechanical Code*.
10. Corrosives shall not include personal or household products in their original packaging used in retail display or commonly used building materials.
11. Buildings and structures occupied for aerosol storage shall be classified as Group S-1, provided that such buildings conform to the requirements of the *International Fire Code*.
12. Display and storage of nonflammable solid and nonflammable or noncombustible liquid hazardous materials in quantities not exceeding the maximum allowable quantity per control area in Group M or S occupancies complying with Section 414.2.5.
13. The storage of black powder, smokeless propellant and small arms primers in Groups M and R-3 and special industrial explosive devices in Groups B, F, M and S, provided such storage conforms to the quantity limits and requirements prescribed in the *International Fire Code*.
14. Canopies used to shelter dispensing operations where flammable compressed gases are located on the roof of the canopy, provided that such canopies comply with Section 406 and the *International Fire Code*.

Reason: Section 307.1 Applies to buildings or structures. A canopy at a motor fuel-dispensing facility is a structure. This proposed code change is intended to clarify that canopies that are used to shelter dispensing operations where flammable compressed gases are located on the roof of the canopy should not be classified in Group H.

The need for this clarification was identified during a "Hydrogen Fueling Station Permitting Workshop" held on July 10, 2007 that was co-sponsored by the United States Department of Energy and the National Association of State Fire Marshals. Building and fire code officials participating in the workshop believe the plain language of Section 307.1 would require classifying the canopy, (which is enclosed at the roof line on four sides), as an H Group structure, and that an exception should be added as clarification.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

This code change was heard by the IFC Code Development Committee.

Committee Action:

Approved as Modified

Modify the proposal as follows:

[F] 307.1 (IFC 202) (Supp) High-hazard Group H. High-hazard Group H occupancy includes, among others the use of a building or structure, or a portion thereof, that involves the manufacturing, processing, generation or storage of materials that constitute a physical or health hazard in quantities in excess of those allowed in control areas complying with Section 414, based on the maximum allowable quantity limits for control areas set forth in Tables 307.1(1) and 307.1(2). Hazardous occupancies are classified in Groups H-1, H-2, H-3, H-4 and H-5 and shall be in accordance with this section, the requirements of Section 415 and the *International Fire Code*.

Exceptions: The following shall not be classified as Group H, but shall be classified as the occupancy that they most nearly resemble:

1. through 13. (No change)
14. Canopies used to shelter dispensing operations where flammable compressed hydrogen gases are located on the roof of the canopy, provided that such canopies comply with Section 406 and the *International Fire Code*.

Committee Reason: The proposal was approved because the committee felt that it provides clarification that weather shelter canopies that store hydrogen gas on their roofs at gaseous motor-fuel dispensing facilities do not create a Group H occupancy. The modification further clarifies the intent of the exception that it applies only to hydrogen, a lighter-than-air flammable gas, and not to all flammable gases.

Assembly Action:

None

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Jeffrey Shapiro, International Code Consultants and Robert J. Davidson, Davidson Code Concepts, LLC, representing themselves, request Approval as Modified by this public comment.

Further modify proposal as follows:

[F] 307.1 (IFC 202) (Supp) High-hazard Group H. High-hazard Group H occupancy includes, among others the use of a building or structure, or a portion thereof, that involves the manufacturing, processing, generation or storage of materials that constitute a physical or health hazard in quantities in excess of those allowed in control areas complying with Section 414, based on the maximum allowable quantity limits for control areas set forth in Tables 307.1(1) and 307.1(2). Hazardous occupancies are classified in Groups H-1, H-2, H-3, H-4 and H-5 and shall be in accordance with this section, the requirements of Section 415 and the *International Fire Code*.

Hazardous materials stored or used on top of roofs or canopies shall be classified as outdoor storage or use and shall comply with the *International Fire Code*.

Exceptions: The following shall not be classified as Group H, but shall be classified as the occupancy that they most nearly resemble:

1. through 13. (No change)
- ~~14. Canopies used to shelter dispensing operations where compressed hydrogen gases are located on the roof of the canopy, provided that such canopies comply with Section 406 and the *International Fire Code*.~~

Commenter's Reason: It was never the intent of the code to assign a Group H occupancy classification to rooftop or canopy top storage, and by providing an exception to the Group H occupancy classification for hydrogen fuel in such conditions, the implication is that any other material in a similar situation would trigger Group H. To fix this problem, the exception text has been relocated to the main paragraph, and the text has been broadened to clarify the intent of the code for all such storage or use, not just hydrogen.

Final Hearing Results

G28-07/08

AMPC

Code Change No: G30-07/08

Original Proposal

Sections: 308.3 (IFC [B] 202), 308.3.1(IFC [B] 202)

Proponent: Roger Severson, RSA Consulting, representing the Oregon Department of Health Services

1. Revise as follows:

308.3 (IFC [B] 202) Group I-2. This occupancy shall include buildings and structures used for medical, surgical, psychiatric, nursing or custodial care ~~on a 24-hour basis for more than five~~ persons who are not capable of self-preservation. This group shall include, but not be limited to, the following:

- Hospitals
- Nursing homes ~~(both intermediate care facilities and skilled nursing facilities)~~
- Mental hospitals
- Detoxification facilities

~~A facility such as the above with five or fewer persons shall be classified as Group R-3 or shall comply with the International Residential Code.~~

2. Revise as follows:

308.3.1 (IFC [B] 202) Definitions. The following words and terms shall, for the purposes of this section and as used elsewhere in this code, have the meanings shown herein.

CHILD CARE FACILITY FACILITIES. A Child care facility facilities that provides care on a 24-hour basis to more than five children, 2¹/₂ years of age or less, shall be classified as Group I-2.

DETOXIFICATION FACILITY. Detoxification facilities serve patients who are provided treatment for substance abuse on a 24-hour basis and who are incapable of self-preservation or who are harmful to others.

HOSPITALS AND MENTAL HOSPITALS. A building or portion thereof used on a 24-hour basis for the medical, psychiatric, obstetrical, or surgical treatment of inpatients who are incapable of self-preservation.

NURSING HOMES. Nursing homes are long-term care facilities on a 24-hour basis, including both intermediate care facilities and skilled nursing facilities, serving more than five persons and any of the persons are incapable of self-preservation.

Reason: (Note: Sections 308.1 and 308.2 are unchanged. Section 308.3 is amended for greater conformity of specific facility functions by moving the "hourly basis" and the number of persons into definitions specific to each topic.) A new facility title has been added which works in concert with an amendment to Section 304.1, clinic-outpatient. This new facility reference is for Ambulatory Health Care Facilities and completes the package for outpatient care where patients are not capable of self-preservation.

The only existing sub-section in 308.3 is for Child Care Facilities. Because it is written to look like a defined statement, it's section was changed to become a definitions section and the title and content for Child care facilities was added to the new list of definitions. The reference to R-3 is deleted because I-2 health care facilities, such as these, are not legally capable of operating in R-3 occupancies, regardless of the number of patients.

Cost Impact For facilities abiding by the requirements for federal funding, or for those areas who are modifying the code in a similar respect, the code change proposal will not increase the cost of construction.

However, for areas where outpatient clinics are allowed to provide services that would render patients incapable of self-preservation and be classified as a B occupancy, there would be an increase to the cost of construction.

Additionally, when a facility is not built to the standards required to receive federal funding, and they would then choose to become certified, another additional cost could be imposed upon the facility.

Public Hearing Results

Committee Action:

Approved as Modified

Modify the proposal as follows:

DETOXIFICATION FACILITY. Detoxification facilities serve patients who are provided treatment for substance abuse on a 24-hour basis and who are incapable of self-preservation or who are harmful to themselves or others.

(Portions of proposal not shown remain unchanged)

Committee Reason: This proposal will help to better determine the types of facilities during the plan review process. The modification further clarifies that detoxification facilities focus on not only the patients possibly harming others but also focuses on the fact that they may be a harm to themselves.

Assembly Action:**None**

Final Hearing Results

G30-07/08

AM

Code Change No: G36-07/08

Original Proposal

Sections: 310.1 (IFC [B] 202)

Proponent: Tom Lariviere, Fire Department, Madison, MS, representing the Joint Fire Service Review Committee

Revise as follows:

310.1 (IFC [B] 202) (Supp) Residential Group R. Residential Group R includes, among others, the use of a building or structure, or a portion thereof, for sleeping purposes when not classified as an Institutional Group I or when not regulated by the *International Residential Code* in accordance with Section 101.2. Residential occupancies shall include the following:

R-1 Residential occupancies containing sleeping units where the occupants are primarily transient in nature, including:

- Boarding houses (transient)
- Hotels (transient)
- Motels (transient)

Congregate living facilities (transient) with 10 or fewer occupants are permitted to comply with the construction requirements for Group R-3.

R-2 Residential occupancies containing sleeping units or more than two dwelling units where the occupants are primarily permanent in nature, including:

- Apartment houses
- Boarding houses (not transient)
- Convents
- Dormitories
- Fraternities and sororities
- Hotels (nontransient)
- Live/work units
- Monasteries
- Motels (nontransient)
- Vacation timeshare properties

CODE CHANGES RESOURCE COLLECTION – INTERNATIONAL BUILDING CODE

Congregate living facilities with 16 or fewer occupants are permitted to comply with the construction requirements for Group R-3.

R-3 Residential occupancies where the occupants are primarily permanent in nature and not classified as Group R-1, R-2, R-4 or I, including:

- Buildings that do not contain more than two dwelling units.
- Adult care facilities that provide accommodations for five or fewer persons of any age for less than 24 hours.
- Child care facilities that provide accommodations for five or fewer persons of any age for less than 24 hours.
- Congregate living facilities with 16 or fewer persons.

Adult care and child care facilities that are within a single-family home are permitted to comply with the *International Residential Code*

R-4 Residential occupancies shall include buildings arranged for occupancy as residential care/assisted living facilities including more than five but not more than 16 occupants, excluding staff.

Group R-4 occupancies shall meet the requirements for construction as defined for Group R-3, except as otherwise provided for in this code, ~~or shall comply with the *International Residential Code*.~~

Exception: Facilities complying with the *International Residential Code* need not meet the construction requirements of a Group R-3 provided that the building is protected by an automatic extinguishing system installed in accordance with Section 903.3.1.1 or 903.3.1.2.

Reason: R-4 occupancies can house residents who cannot evacuate within a reasonable amount of time. This change would restrict builders from using the less restrictive IRC unless the home is equipped with a fire sprinkler system. This proposal will require a fire sprinkler system in all R-4 occupancies. A fire sprinkler system is required by federal regulations for any of these facilities that may also be licensed.

Cost Impact: This proposal will increase the cost of construction, unless the facility is also desiring compliance with federal regulations.

Public Hearing Results

Committee Action:

Approved as Modified

Modify the proposal as follows:

R-4 Residential occupancies shall include buildings arranged for occupancy as residential care/assisted living facilities including more than five but not more than 16 occupants, excluding staff.

Group R-4 occupancies shall meet the requirements for construction as defined for Group R-3, except as otherwise provided for in this code or shall comply with the *International Residential Code* provided the building is protected by an automatic extinguishing system installed in accordance with Section 903.2.7

~~**Exception:** Facilities complying with the *International Residential Code* need not meet the construction requirements of a Group R-3 provided that the building is protected by an automatic extinguishing system installed in accordance with Section 903.3.1.1 or 903.3.1.2.~~

(Portions of proposal not shown remain unchanged)

Committee Reason: The proposal was approved based upon the proponent's reason which is concerned with the lifesafety of occupants in Group R-4 occupancies this relates to both their ability to evacuate quickly and the number of occupants. The modification is felt to be cleaner language than the currently proposed exception. The meaning of the language is the same. There were some concerns expressed by committee members that proper justification for requiring sprinklers was not provided by the proponent.

Assembly Action:

None

Final Hearing Results

G36-07/08

AM

Code Change No: **G38-07/08**

Original Proposal

Sections: 402.2, 402.5.2 (New), 402.9

Proponent: Kerwin Lee, Rolf Jensen & Associates, Inc.

1. Revise as follows:

402.2 Definitions. The following words and terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

COVERED MALL BUILDING. A single building enclosing a number of tenants and occupants such as retail stores, drinking and dining establishments, entertainment and amusement facilities, passenger transportation terminals, offices, and other similar uses wherein two or more tenants have a main entrance into one or more malls. For the purpose of this chapter, anchor buildings shall not be considered as a part of the covered mall building. The term covered mall building shall include open mall buildings as defined by this section.

MALL. A roofed or covered common pedestrian area within a covered mall building that serves as access for two or more tenants and not to exceed three levels that are open to each other. The term mall shall include open malls as defined by this section.

OPEN MALL. An unroofed common pedestrian way serving a number of tenants not exceeding three levels. Circulation at levels above grade shall be permitted to include open exterior balconies leading to exits discharging at grade.

OPEN MALL BUILDING. Several structures housing a number of tenants such as retail stores, drinking and dining establishments, entertainment and amusement facilities, offices, and other similar uses wherein two or more tenants have a main entrance into one or more open malls. For the purpose of this chapter, anchor buildings are not considered as a part of the open mall building.

2. Add new text as follows:

402.5.2 Minimum width open mall. The minimum floor and roof opening width above grade shall be 20 feet (9096 mm) in open malls.

3. Revise as follows:

402.9 (Supp) Smoke control. Where a covered mall building contains an atrium, a smoke control system shall be provided in accordance with Section 404.4.

Exceptions:

1. A smoke control system is not required in covered mall buildings, when an atrium connects only two stories.
2. An open mall building.

Reason: The purpose of the proposed changes is to provide a code process for addressing covered mall types of building projects that do not have a roof over the common pedestrian circulation area. Projects of this type are common, particularly in the "sun belt" areas of the country and in similar climates around the world. These projects should have the same benefits from the covered mall provisions, because an open to the sky mall provides equivalent or better life safety and property protection.

The key to this concept is to have everything a covered mall building would have, except for the roof over the mall area. The requirement for an open mall requires a minimum dimension of 20 feet from grade through the roof. This dimension aligns with Section 402.5.1, minimum mall width for egress. This provides a dimensional value for the required open portion. The open portion would be required from the lowest/grade level to the roof. This will provide ventilation from the lowest level. The intent of this requirement should not prevent the use of balconies on either side of the opening or pedestrian bridges across the opening.

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Section 402.9 refers to Section 404, Atriums, for smoke control. When a mall becomes three levels, smoke control is required. The change removes the requirement for smoke control in an open mall. Without a roof over the mall area and required openings from grade level, natural ventilation is provided and mechanical smoke control is no longer necessary. This would include smoke control within the tenant spaces. The main reason for smoke control is to maintain a tenable environment in the mall area to permit occupants of the covered mall building to safely egress. The intent of this change should not affect any other requirements associated with Covered Malls.

Cost Impact: The code change proposal may decrease the cost of construction with the removal of the roof and smoke control system.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: This allows a reasonable option for design where malls are open to the sky. Open mall provisions would not limit other more traditional methods of compliance for individual or strip mall retail configurations.

Assembly Action:

None

Final Hearing Results

G38-07/08

AS

Code Change No: G39-07/08

Original Proposal

Sections: 402.2, 402.4 (New), 402.7.3, 402.7.3.1; 402.7.3.1.1, 402.4.1.1, 402.4.1.5 (New), 402.4.1.5.1 (New)

Proponent: Sarah A. Rice, CBO, Schirmer Engineering Corporation

THESE PROPOSALS ARE ON THE AGENDA OF THE IBC GENERAL AND IBC MEANS OF EGRESS COMMITTEES AS 2 SEPARATE CODE CHANGES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IBC GENERAL

1. Revise as follows:

402.2 Definitions. The following words and terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

COVERED MALL BUILDING. A single building enclosing a number of tenants and occupants such as retail stores, drinking and dining establishments, entertainment and amusement facilities, passenger transportation terminals, offices, and other similar uses, with or without an anchor building(s) attached. ~~wherein two or more tenants have a main entrance into one or more malls. For the purpose of this chapter, anchor buildings shall not be considered as a part of the covered mall building.~~

2. Add new text as follows:

402.4 Mall access. A minimum of two tenant spaces shall have an entrance opening onto a mall, or malls.

402.7.3 Anchor building. Where an anchor building is attached to a covered mall building, the anchor building shall be constructed as a separate building, and not considered as a part of the covered mall building.

3. Revise as follows:

~~402.7.3~~ 402.7.3.1 Anchor building separation. An anchor building shall be separated from the covered mall building by fire walls complying with Section 705.

Exception: Anchor buildings of not more than three stories above grade plane that have an occupancy classification the same as that permitted for tenants of the covered mall building shall be separated by 2-hour fire-resistive fire barriers complying with Section 706.

402.7.3.1.1 402-7-3-4 Openings between anchor building and mall. Except for the separation between Group R-1 sleeping units and the mall, openings between anchor buildings of Type IA, IB, IIA and IIB construction and the mall need not be protected.

PART II – IBC MEANS OF EGRESS

1. Revise as follows:

402.4.1.1 Occupant formula. In determining required means of egress of the mall, the number of occupants for whom means of egress are to be provided shall be based on gross leasable area of the covered mall building (excluding anchor buildings) and the occupant load factor as determined by the following equation.

$$OLF = (0.00007) (GLA) + 25 \quad \text{(Equation 4-1)}$$

where:

OLF = The occupant load factor (square feet per person).

GLA = The gross leasable area (square feet).

Exception: Tenant spaces attached to a covered mall building but with a means of egress system that is totally independent of the covered mall building shall not be considered as gross leasable area for determining the required means of egress for the covered mall building.

2. Add new text as follows:

402.4.1.5 Exterior tenant spaces Tenant spaces that do not have an entrance opening onto a mall shall have a main entrance opening directly to the exterior. The main entrance shall be of sufficient width to accommodate not less than one-half the occupant load of the tenant space.

402.4.1.5.1 Exit passageways. Where exit passageways provide a secondary means of egress from both an interior and exterior tenant space, the exit passageway shall be of sufficient width to accommodate both the occupant load from the mall and not less than one-half the occupant load of the each exterior tenant discharging into the exit passageway.

Reason: This proposal seeks recognize how covered mall buildings are being designed today by providing guidance on how to address a tenant spaces, that is are physically part of a covered mall building, but does not have an opening onto a mall with but rather to the exterior of the building. This type of design often creates an “outer loop” of tenant spaces which have no communication with the interior of the mall.

The only element that will vary for these tenant spaces is how they contribute to the design of the means of egress system of the covered mall building. All other elements remain the same, e.g., fire alarm, sprinkler, etc.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

PART I – IBC GENERAL

Withdrawn by Proponent

PART II – IBC MEANS OF EGRESS

Committee Action:

Approved as Modified

Modify the proposal as follows:

402.4.1.1 Occupant formula. In determining required means of egress of the mall, the number of occupants for whom means of egress are to be provided shall be based on gross leasable area of the covered mall building (excluding anchor buildings) and the occupant load factor as determined by the following equation.

$$OLF = (0.00007) (GLA) + 25 \quad \text{(Equation 4-1)}$$

where:

OLF = The occupant load factor (square feet per person).

GLA = The gross leasable area (square feet).

Exception: Tenant spaces attached to a covered mall building but with a means of egress system that is totally independent of the covered mall building shall not be considered as gross leasable area for determining the required means of egress for the covered mall building.

~~**402.4.1.5 Exterior tenant spaces** Tenant spaces that do not have an entrance opening onto a mall shall have a main entrance opening directly to the exterior. The main entrance shall be of sufficient width to accommodate not less than one-half the occupant load of the tenant space.~~

~~**402.4.1.5.1 Exit passageways.** Where exit passageways provide a secondary means of egress from both an interior and exterior tenant space, the exit passageway shall be of sufficient width to accommodate both the occupant load from the mall and not less than one-half the occupant load of the each exterior tenant discharging into the exit passageway.~~

Committee Reason: Based on a request by the proponent, Sections 402.4.1.5 and 402.4.2.5.1 were deleted and not considered as part of this proposal because there were problems with the proposed language. The exception to Section 402.4.1.1 was approved and would provide a reasonable allowance for spaces attached to a mall but that do not egress through the mall. A concern was expressed for situations where non-required exits would provide access into the mall.

Assembly Action:

None

Final Hearing Results

G39-07/08, Part I	WP
G39-07/08, Part II	AM

Code Change No: G44-07/08

Original Proposal

Section: 403.1

Proponent: Gregory R. Keith, Professional heuristic Development, representing the Boeing Company

Revise as follows:

403.1 Applicability. The provisions of this section shall apply to buildings with an occupied floor located more than 75 feet (22 860 mm) above the lowest level of fire department vehicle access.

Exception: The provisions of this section shall not apply to the following buildings and structures:

1. Airport traffic control towers in accordance with Section 412.
2. Open parking garages in accordance with Section 406.3.
3. Buildings with an ~~occupancy~~ in Group A-5 occupancy in accordance with Section 303.1.
4. ~~Low-hazard~~ special industrial occupancies in accordance with Section 503.1.1.
5. Buildings with an ~~occupancy~~ in Group H-1, H-2 or H-3 occupancy in accordance with Section 415.

Reason: As proponents of Item G96-04/05, it was our intent to remove some inconsistencies in Section 503.1.1 as regards which hazard categories qualified as special industrial occupancies. At the time, the section limited that designation to low-hazard occupancies, although, some of the examples cited in the provision were moderate-hazard occupancies. Our proposal suggested adding moderate-hazard occupancies to the provision. The code development committee agreed with our concern; however, took it one step further and modified the proposal to increase the flexibility of the provision by eliminating reference to any specific hazard category. Since this provision has appeared in the 2006 Edition of the IBC, it has been noted that Section 403.1 has an exception that references Section 503.1.1, but contains the former "low-hazard" language. Section 403.1 should have been correlated with the change to Section 503.1.1 at the time. This proposal corrects that oversight. It also makes a couple of editorial changes to the exception so that the terminology is consistent with that used elsewhere in the code.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The proposed language is more consistent with code terminology throughout the IBC.

Assembly Action:

None

Final Hearing Results

G44-07/08

AS

Code Change No: **G46-07/08**

Original Proposal

Sections: [F] 403.2.1 (New), 403.2.1.1 (New), [F] 403.2.1.1.1 (New), [F] 403.2.1.2 (New), [F] 403.2.2 (New) [IFC 914.3.1.1 (New), IFC 914.3.1.1.1 (New), IFC 914.3.1.1.1.1 (New), IFC 914.3.1.1.2 (New), IFC 914.3.1.2 (New); IFC 509.1 (IBC [F] 911.1)

Proponent: Gary Lewis, Chair, representing the ICC Ad Hoc Committee on Terrorism Resistant Buildings

1. Add new text as follows:

[F] 403.2.1 (IFC 914.3.1.1) Sprinkler riser redundancy and isolation. All buildings that are more than 420 feet (128 m) in height shall have all risers supplying automatic sprinkler systems interconnected to each other at the top and bottom most floor of each vertical riser zone. The interconnections shall be at least as large as the largest riser supplied.

[F] 403.2.1.1 (IFC 914.3.1.1.1) Number of risers and separation. A minimum of two sprinkler water supply risers shall be provided in each vertical riser zone of the building. Sprinkler water supply risers shall be placed a distance apart equal to not less than one-half of the length of the maximum overall diagonal dimension of the building or area to be served measured in a straight line between the nearest portion of the sprinkler water supply risers.

[F] 403.2.1.1.1 (IFC 914.3.1.1.1.1) Hydraulic design evaluations. Independent hydraulic design evaluations shall be completed utilizing individual water supply risers for each vertical riser zone. System hydraulic design shall not be based upon redundancy of water supply risers for each vertical riser zone.

[F] 403.2.1.2 (914.3.1.1.2) Control valves. Manual and remote control valves shall be provided on all riser piping supplying automatic sprinkler systems at every third floor of the building served. This requirement is independent of sprinkler floor control valves required by Section 903.4.3

[F] 403.2.2 (IFC 914.3.1.2) Water supply to required fire pumps. Required fire pumps shall draw from a minimum of two independent street level water mains located in different streets.

Exception: When the street level water main is a looped or gridded system, two taps may be drawn from the same main provided the main is valved such that an interruption on one side of the loop or grid can be isolated so that the water supply will continue without interruption through at least one of the taps. Each tap shall be sized to supply the required flow. The taps shall be located as remote from one another as is practicable given the site conditions.

2. Revise as follows:

IFC 509.1 (IBC [F] 911.1) (Supp) Features. Where required by other sections of this code and in all buildings classified as high-rise buildings by the *International Building Code*, a fire command center for fire department operations shall be provided. The location and accessibility of the fire command center shall be approved by the fire department. The fire command center shall be separated from the remainder of the building by not less than a 1-hour fire barrier constructed in accordance with Section 706 of the *International Building Code* or horizontal assembly constructed in accordance with Section 711 of the *International Building Code*, or both. The room shall be a minimum of 96 square feet (9 m²) with a minimum dimension of 8 feet (2438 mm). A layout of the fire command center and all features required by this section to be contained therein shall be submitted for approval prior to installation. The fire command center shall comply with NFPA 72 and shall contain the following features:

1. The emergency voice/alarm communication system unit.
2. The fire department communications system.
3. Fire-detection and alarm system annunciator system.
4. Annunciator visually indicating the location of the elevators and whether they are operational.
5. Status indicators and controls for air-handling systems.
6. The fire-fighter=s control panel required by Section 909.16 for smoke control systems installed in the building.
7. Controls for unlocking stairway doors simultaneously.
8. Sprinkler valve and water-flow detector display panels.
9. Emergency and standby power status indicators.
10. A telephone for fire department use with controlled access to the public telephone system.
11. Fire pump status indicators.
12. Schematic building plans indicating the typical floor plan and detailing the building core, means of egress, fire protection systems, fire-fighting equipment and fire department access.
13. Work table.
14. Generator supervision devices, manual start and transfer features.
15. Public address system, where specifically required by other sections of this code.
16. Elevator fire recall switch in accordance with ASME A17.1.
17. Elevator emergency or standby power selector switch(es), where emergency or standby power is provided.
18. Controls and status indicators for remote control valves on vertical sprinkler/standpipe risers

Reason: The purpose of this proposed change is to increase the reliability of fire suppression systems in very tall buildings, those that exceed 420 feet in height, by requiring looping of sprinkler uses and independent street-level water feeds.

The difficulty of fighting fires in very tall buildings ranges from hard to virtually impossible. Accordingly, the reliable functioning of required sprinkler systems is critically important. The National Institute of Standards and Technology (NIST) World Trade Center (WTC) Report documented that the proximate cause of the collapse was a building contents fire that raged out of control, in part at least, because the building's fire sprinkler systems were non-functional due to the initial aircraft attack. Events far less dramatic could knock out or make a sprinkler riser inoperative, thereby leaving the structure very vulnerable to fire.

Recommendation 12 of the NIST WTC report calls for the redundancy of active fire suppression systems to be increased to accommodate the greater risks associated with increasing building height and population. This proposal seeks to do that by providing two water feeds to each floor designed such that the system will function as intended if one of those feeds is damaged or otherwise interrupted.

It is interesting to note that existing standards for water mains in residential subdivisions call for looping and valving to ensure that no more than 20 homes could be cut off by a water main break. Such a break would create a fire suppression risk for 4 people (the average occupancy of one home) or no more than 80 people (assuming all 20 homes catch fire). In contrast, we do not require looping and valving to isolate failure in buildings that might contain 10,000 occupants. This proposal seeks to correct that problem.

Proposed new Subsection 403.2.1 requires the interconnection (looping) of sprinkler risers in each vertical zone.

Proposed new Subsection 403.2.1.1 requires two risers for every zone and specifies a separation distance to reduce the possibility that one incident could incapacitate both risers.

Proposed new Subsection 403.2.1.1.1 ensures that the sprinkler system will be designed to function as intended and required from either riser. This is consistent with the goal of providing redundancy.

Proposed new Subsection 403.2.1.2 requires riser control valves at every third floor of the building. This provision supports the stated intent of this code change by ensuring that a riser break (or other problem eliminating the riser's functionality) will not leave more than two floors without the required sprinkler protection. Standpipe control valves are already required to be monitored and NFPA 14 requires redundancy. However, the control valves required by new section 403.2.1.2 are in addition to the control valves required by NFPA 14. Along with the redundant sprinkler riser that is required by section 403.2.1, the valves required by this new section will assure that any riser break will not leave more than two floors without the required sprinkler protection.

These new valves raise the possibility that someone will inadvertently close one or more. Accordingly, a proposed amendment to Section 911.1 of the Code requires that these automatic valves be able to be monitored from the fire command center by the use of status indicators. This will make it possible to monitor continuously all riser valves from one location and correct any problem from that location.

New Subsection 403.2.2 requires fire pumps to be fed from two independent water mains in separate streets. This will greatly reduce the possibility of the loss of water due to a main break, given the valving which is a feature of public water systems.

Bibliography:

National Institute of Standards and Technology. Final Report of the National Construction Safety Team on the Collapses of the World Trade Center Towers. United States Government Printing Office: Washington, D.C. September 2005.

Cost Impact: This proposal will increase the cost of construction for very tall buildings, but the additional cost is warranted by the additional risk inherent in such buildings.

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: Fire protection system design criteria and information belong in Chapter 9. The utility and effectiveness of top and bottom sprinkler riser interconnection is questionable. It is also questionable as to the availability of remotely controlled sprinkler riser valves. Proposed Section 403.2.2 needs correlation with Section 903.3.5.2. The ICC Code Technology Committee agrees with the need for redundancy but disagrees with the approach taken in this proposal. There is also a NIST task group working on this topic.

Assembly Action:

None

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Paul K. Heilstedt, PE, FAIA, Chair, ICC Code Technology Committee (CTC), Gerry Jones/Herman Brice, Co-chairs, NIBS/MMC Committee for Translating the NIST World Trade Center Investigation Recommendations into Building Codes and Gary Lewis, Chair, representing the ICC Ad Hoc Committee on Terrorism Resistant Buildings request Approval as Modified by this public comment.

Modify proposal as follows:

~~[F] 403.2.1 (IFC 914.3.1.1) Number of sprinkler risers and system design redundancy and isolation.~~ All buildings that are more than 420 feet (128 m) in height shall have all risers supplying automatic sprinkler systems interconnected to each other at the top and bottom most floor of each vertical riser zone. The interconnections shall be at least as large as the largest riser supplied. ~~Each sprinkler system zone in buildings that are more than 420 feet (128 m) in height shall be supplied by a minimum of two risers. Each riser shall supply sprinklers on alternate floors. If more than two risers are provided for a zone, sprinklers on adjacent floors shall not be supplied from the same riser.~~

~~[F] 403.2.1.1 (IFC 914.3.1.1.1) Number of risers and separation.~~ A minimum of two sprinkler water supply risers shall be provided in each vertical riser zone of the building. Sprinkler water supply risers shall be placed a distance apart equal to not less than one-half of the length of the maximum overall diagonal dimension of the building or area to be served measured in a straight line between the nearest portion of the sprinkler water supply risers.

~~[F] 403.2.1.1 (IFC 914.3.1.1.1) Riser location.~~ Sprinkler risers shall be placed in stair enclosures which are remotely located in accordance with Section 1015.2.

~~[F] 403.2.1.1.1 (IFC 914.3.1.1.1.1) Hydraulic design evaluations.~~ Independent hydraulic design evaluations shall be completed utilizing individual water supply risers for each vertical riser zone. System hydraulic design shall not be based upon redundancy of water supply risers for each vertical riser zone.

~~[F] 403.2.1.2 (914.3.1.1.2) Control valves.~~ Manual and remote control valves shall be provided on all riser piping supplying automatic sprinkler systems at every third floor of the building served. This requirement is independent of sprinkler floor control valves required by Section 903.4.3

~~[F] 403.2.2 (IFC 914.3.1.2) Water supply to required fire pumps.~~ Required fire pumps shall be supplied by connections to draw from a minimum of two independent street level water mains located in different streets. Separate supply piping shall be provided between each connection to water main and the pumps. Each connection and the supply piping between the connection and the pumps shall be sized to supply the flow and pressure required for the pumps to operate.

~~Exception: When the street level water main is a looped or gridded system, two taps may be drawn from Two connections to the same main shall be permitted provided the main is valved such that an interruption on one side of the loop or grid can be isolated so that the water supply will continue without interruption through at least one of the connections taps. Each tap shall be sized to supply the required flow. The taps shall be located as remote from one another as is practicable given the site conditions.~~

(Portions of proposal not shown remain unchanged)

Commenter's Reason: The purpose of this public comment is to increase the reliability of fire sprinkler systems in very tall buildings, those that exceed 420 feet in height, by requiring a minimum of two risers for each sprinkler zone and pumps to be supplied by a minimum of two connections to the municipal distribution system.

The difficulty of fighting fires in very tall buildings ranges from difficult to virtually impossible with the sprinkler system impaired. Accordingly, the reliable functioning of sprinkler systems is critical. Various Events could cause a sprinkler riser to be impaired, thereby leaving the structure highly vulnerable to fire.

Recommendation 12 of the NIST WTC report calls for the redundancy of active fire suppression systems to be increased to accommodate the greater risks associated with increasing building height and population. This proposal seeks to do that by requiring two risers designed such that, if one riser is taken out of service, the other will be able to supply sprinklers on the floors above and below. This will impede any fire spread and allow the fire department time to respond and extinguish the fire. At the Meridian Plaza fire in Philadelphia, the further spread of an out of control fire occurring on floors not protected by sprinklers was prevented by the operation of ten sprinklers when the fire reached a floor which had been retrofitted with sprinklers.

403.2.1 requires a minimum of two sprinkler risers in each sprinkler zone.

403.2.1.1 requires the risers to be located in protected stair enclosures and specifies a separation distance to reduce the possibility that one incident could incapacitate both risers which is consistent with the approach used in the code for stair enclosure separation.

403.2.2 is text similar to the original proposal which requires fire pumps to be fed from two water mains in separate streets. This will greatly reduce the possibility of the loss of water due to a main break, given the valving which is a feature of public water systems, with the goal of providing redundancy. The exception is revised to provide performance language which is not specific to a specific configuration (looped or gridded in the original proposal) and eliminates the subjective connection remoteness criteria.

Code issues are assigned to the CTC by the ICC Board as "areas of study". Information on the CTC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CTC effort can be downloaded from the following website: <http://www.iccsafe.org/cs/cc/ctc/index.html>. Since its inception in April/2005, the CTC has held fifteen meetings - all open to the public. This public comment is a result of the CTC's investigation of the area of study entitled "NIST World Trade Center Recommendations". The CTC web page for this area of study is: <http://www.iccsafe.org/cs/cc/ctc/WTC.html>

Final Hearing Results

G46-07/08

AMPC

Code Change No: G48-07/08

Original Proposal

Sections: 403.3.1, 403.3.2, 507.8, 3310.1 (IFC [B] 1411.1)

Proponent: Philip Brazil, PE, Reid Middleton, Inc., representing himself

Revise as follows:

403.3.1 (Supp) Type of construction. The following reductions in the minimum fire resistance rating of the building elements in Table 601 shall be permitted as follows:

1. For buildings not greater than 420 feet (128 m) in building height, the fire resistance rating of the building elements in Type IA construction shall be permitted to be reduced to the minimum fire resistance ratings for the building elements in Type IB.

Exception: The required fire-resistance rating of columns supporting floors shall not be permitted to be reduced.

2. In other than Groups F-1, M and S-1, the fire resistance rating of the building elements in Type IB construction shall be permitted to be reduced to the fire resistance ratings in Type IIA.
3. The height and area limitations of a building containing building elements with reduced fire resistance ratings shall be permitted to be the same as the building without such reductions.

403.3.2 Shaft enclosures. For buildings not greater than 420 feet (128 m) in building height, the required fire-resistance rating of the fire barriers enclosing vertical shafts, other than exit enclosures and elevator hoistway enclosures, shall be reduced to 1 hour where automatic sprinklers are installed within the shafts at the top and at alternate floor levels.

507.8 (Supp) Aircraft paint hangar. The area of a Group H-2 aircraft paint hangar no more than one-story above grade plane, shall not be limited where such aircraft paint hangar complies with the provisions of Section 412.4 and is entirely surrounded by public ways or yards not less in width than one and one-half times the height of the building height.

3310.1 (IFC [B] 1411.1) Stairways required. Where a building has been constructed to a building height ~~greater than~~ of 50 feet (15 240 mm) or four stories, or where an existing building exceeding 50 feet (15 240 mm) in building height is altered, at least one temporary lighted stairway shall be provided unless one or more of the permanent stairways are erected as the construction progresses.

Reason: The changes are proposed for consistency with the actions taken by the membership on Proposal G81-06/07-AS. In IBC Section 3310.1 and IFC Section 1411.1, “greater than” is changed to “of” because “constructed to a building height of 50 feet” adequately specifies the threshold before a temporary lighted stairway is required. A related proposal adjusts the references to “height” and “building height” in Chapter 5.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The change would coordinate with G81-06/07. The additional language clarifies the application of the definition for “building height.”

Assembly Action:

None

Final Hearing Results

G48-07/08

AS

Code Change No: G50-07/08

Original Proposal

Section: 403.3.2

Proponent: Thomas Kinsman, T. A. Kinsman Consulting Company, representing himself

Revise as follows:

403.3.2 Shaft enclosures. For buildings not greater than 420 feet (128 m) in height, the required fire-resistance rating of the fire barriers enclosing vertical shafts, other than exit enclosures and elevator hoistway enclosures, shall be permitted to be reduced to 1 hour where automatic sprinklers are installed within the shafts at the top and at alternate floor levels.

Reason: This proposal clarifies the codes intent which is to permit the fire resistive reduction but not demand the reduction.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Modified

Modify the proposal as follows:

403.3.2 Shaft enclosures. For buildings not greater than 420 feet (128 m) in height, the required fire-resistance rating of the fire barriers enclosing vertical shafts, other than exit enclosures and elevator hoistway enclosures, ~~shall be~~ is permitted to be reduced to 1 hour where automatic sprinklers are installed within the shafts at the top and at alternate floor levels.

Committee Reason: The modification was editorial for consistent code language. The proposal clarifies that the provision reducing the required fire resistance for shafts is an allowance and not a requirement.

Assembly Action:

None

Final Hearing Results

G50-07/08

AM

Code Change No: G53-07/08

Original Proposal

Section: [F] 403.7

Proponent: Tom Lariviere, Fire Department, Madison, MS, representing the Joint Fire Service Review Committee

THIS PROPOSAL IS ON THE AGENDA OF THE IFC CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IFC CODE DEVELOPMENT COMMITTEE.

Revise as follows:

[F] 403.7 Emergency responder radio Fire department communications system. ~~A two-way fire department communications system shall be provided for fire department use in accordance with Section 907.2.12.3. An~~ emergency responder radio communications system shall be installed where required to provide the required level of

radio coverage for emergency responders by allowing radio frequencies to be transmitted and received throughout the building. Amplifiers shall be able to handle the frequencies in operation by the local emergency responder agencies. A permanent sign shall be installed in the fire command center indicating the presence of the amplification system and the frequencies served.

Reason: To allow the emergency services to communicate properly throughout the building during an emergency. This proposal will replace the typical hardwired communications system with a radio system that will work with the FD radio system and provide adequate radio communications

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing Results

This proposal was heard by the IFC Code Development Committee.

Committee Action:

Approved as Modified

Modify the proposal as follows:

~~[F] 403.7 Emergency responder radio. An emergency responder radio communications system shall be installed where required to provide the required level of radio coverage for emergency responders by allowing radio frequencies to be transmitted and received throughout the building. Amplifiers shall be able to handle the frequencies in operation by the local emergency responder agencies. A permanent sign shall be installed in the fire command center indicating the presence of the amplification system and the frequencies served. in accordance with Section 511.1 of the *International Fire Code*.~~

Committee Reason: The proposal was approved for coordination with the action taken on code change F87-07/08. The modification makes a simple reference to the correct section of the *International Fire Code* that contains radio communications system requirements for new buildings.

Assembly Action:

None

Final Hearing Results

G53-07/08

AM

Code Change No: G61-07/08

Original Proposal

Section: 403.12 (New)

Proponent: Gary Lewis, Chair, representing the ICC Ad Hoc Committee on Terrorism Resistant Buildings

Add new text as follows:

403.12 Remoteness of exit stairway enclosures. The nearest wall of separate required exit stairway enclosures shall be placed a distance apart equal to not less than one-third of the length of the maximum overall diagonal dimension of the building or area to be served measured in a straight line between the nearest portion of the stairway enclosure. In buildings with three or more exit stairway enclosures, at least two of the exit stairway enclosures shall be placed a distance apart equal to not less than one-third of the length of the maximum overall diagonal dimension of the building or area to be served measured in a straight line between the nearest portion of the exit stairway enclosure. Interlocking or scissor stairs shall be counted as one exit stairway.

Reason: The purpose of this change is to add a new Section 403.19 that will require stair shafts to meet remoteness criteria, in addition to the separation distance requirements for exit access doorways of Section 1015.2.1.

The Code has long contained requirements designed to ensure that all the exit access doors on a floor are not grouped closely together. Grouping exit access doors too closely defeats the whole point of multiple exits.

The National Institute of Standards and Technology's (NIST) report on the World Trade Center (WTC) tragedy recommends a new remoteness criterion for stair shafts (Recommendation 18). The report pointed out that, at some locations, stairs that met the exit access distance requirements were, nonetheless, very closely grouped. Their shafts were very close together and all three were destroyed by the airplane impact, thereby dooming all above. It is not the proponents' intent to make stair shafts immune to airplane attacks but the re-examination of our basic criteria that was prompted by the attack and the WTC Report suggests that far less dramatic events could render more than one stair shaft unusable. The cause need not be an act of terror either. There are other explosive hazards in high rise buildings. It is only prudent to separate the stair shafts themselves as well as the exit access doors.

It is possible that, in some high rise office buildings, this provision will result in one or more stairs being across the hall from the core rather than in the core. No additional floor area will be required for the sum total of core and stairs. If a stair is outside the traditional core, then the core itself will be smaller. Some might suggest that such a stair location might inhibit design flexibility in tenant spaces. This is simply not true. The architect might have to work a little harder to develop layouts but, with a little skill, any constraint can be incorporated into an acceptable design.

Bibliography:

National Institute of Standards and Technology. Final Report of the National Construction Safety Team on the Collapses of the World Trade Center Towers. United States Government Printing Office: Washington, D.C. September 2005.

Cost Impact: The proposal will not increase construction costs. It merely deals with the location of building elements that are already required by the Code.

Analysis: The last sentence of this proposal addresses interlocking/scissor stairways. There are other code changes dealing specifically with scissored stairways that will be heard by the IBC Means of Egress Committee.

Public Hearing Results

Committee Action:**Disapproved**

Committee Reason: Forcing the stairway enclosures to be 1/3 of the diagonal of the building apart will have a profound effect on the design and costs of the building. This should not be done without technical justification and studies on if this proposed requirement will have the desired results.

Assembly Action:**None**

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because public comments were submitted.

Public Comment 1:

Herman Brice and Gerald Jones, National Institute of Building Sciences/Multihazard Mitigation Council representing the NIBS/MMC Committee for Translating the NIST World Trade Center Recommendations into Building Codes requests Approval as Modified by this public comment.

Replace proposal as follows:

403.12 Remoteness of exit stairway enclosures. The required exit stairway enclosures shall be separated by a distance not less than 30 feet or not less than one-fourth of the length of the maximum overall diagonal dimension of the building or area to be served, whichever is less. The distance shall be measured in a straight line between the nearest points of the stairway enclosures. In buildings with three or more exit stairway enclosures, at least two of the exit stairway enclosures shall comply with this section. Interlocking or scissor stairs shall be counted as one exit stairway.

Commenter's Reason: The change, as originally proposed, would add a new Section 403.19 requiring stair shafts to meet remoteness criteria in addition to the separation distance requirements for exit access doorways of Section 1015.2.1. The reason noted that the code has long contained requirements designed to ensure that all the exit access doors on a floor are not grouped closely together, that grouping exit access doors too closely defeats the whole point of multiple exits, and that the National Institute of Standards and Technology's (NIST) report on the World Trade Center (WTC) tragedy recommends a new remoteness criterion for stair shafts (Recommendation 18). The report pointed out that, at some locations, stairs that met the exit access distance requirements were, nonetheless, very closely grouped. Although the ICC committee disapproved this change indicating that additional technical justification is needed, the vote was very close. The NIBS/MMC committee believes that the modification as proposed by this public comment will lessen the cost and design impacts considerably while also providing the needed separations.

Final Hearing Results

G61-07/08**AMPC1**

Code Change No: **G64-07/08**

Original Proposal

Section: 403.15 (New)

Proponent: Ken Kraus, Los Angeles Fire Department, CA and Daniel E. Nichols, PE, New York Division of Code Enforcement and Administration, Albany, NY

Add new text as follows:

403.15 Smoke exhaust. Buildings and structures shall be equipped with natural or mechanical ventilation for removal of products of combustion in accordance with one of the following:

1. Easily identifiable, manually operable windows or panels shall be distributed around the perimeter of each floor at not more than 50 foot intervals. The area of operable windows or panels shall not be less than 40 square feet per 50 linear feet of perimeter.

Exceptions:

1. In Group R-1 occupancies, each guest room or suite having an exterior wall shall be permitted to be provided with 2 square feet of venting area in lieu of the area specified in item 1.
2. Windows shall be permitted to be fixed tempered glass panes provided that no coating or film is applied that will modify the natural breaking characteristics of the glass
2. Mechanical air-handling equipment providing one exhaust air change every 10 minutes for the area involved. Return and exhaust air shall be moved directly to the outside without recirculation to other portions of the building.
3. Any other approved design that will produce equivalent results.

(Renumber subsequent sections)

Reason: Every code development cycle since the 2000 IBC was created, a code change has been submitted regarding requirements to vacate smoke from hi-rise buildings. Unfortunately, many of these proposals were attempting to utilize existing technical sections of the IBC regarding a smoke control system when all they were intending was a way for the fire service to remove smoke from a hi-rise. Smoke control systems would do a great job of removing smoke for the fire department but the full applicability of IBC Section 909 exceeds the intended purpose.

This proposal is to provide a new section to the hi-rise section with technical requirements for smoke exhaust. The proposal permits three ways to comply; natural, mechanical, or alternative method. The result of this system is one of three methods:

1. The fire department opens windows on the floor and provides pressurization by fans.
2. The buildings HVAC system is equipped with dampers per floor, an arrangement to stop recirculation by providing 100% fresh air intake and outside exhaust, and a control panel at the fire command center.
3. An alternative design approved by the code official.

The issue that this code change proposal addresses is that of fire department operations. One of the fire department's duties during a fire event is to expel the smoke after the fire has occurred. With a current lack of requirements for this type of system, the only way that ventilation of smoke or odors occurs without significant building damage is utilizing the exit stairs with fans provided by the fire department. This is marginally effective and is further inhibited by buildings with floor plans that do not have a clear path between two exit stairs or when the building is of significant height.

Addressing automatic sprinkler systems; a fire suppressed by an automatic sprinkler system does significantly reduce the total amount of smoke produced. However, the atmosphere created by a sprinkler suppressed fire or smoke from other incidents, such as burnt food, smoldering fires, or the like, still produces a volume of smoke that needs to be removed after the incident.

To reiterate, this system is for fire department use and not intended to be part of the initial life safety systems placed in hi-rise buildings, like sprinklers, fire alarms, and pressurized exit stairways. During a coordinated fire event, the fire command center already requires air-handling equipment and controls to be located therein. When using the mechanical ventilation option, the net result of this proposal is appropriate dampers to zone, per floor, and an additional requirement to provide for 100% fresh air return and exhaust.

Cost Impact: This code change proposal will increase the cost of construction.

Public Hearing Results

This proposal was heard by the IFC Code Development Committee.

Committee Action:**Approved as Modified****Modify the proposal as follows:**

403.15 Smoke exhaust. Buildings and structures shall be equipped with natural or mechanical ventilation for removal of products of combustion in accordance with one of the following:

1. Easily identifiable, manually operable windows or panels shall be distributed around the perimeter of each floor at not more than 50 foot intervals. The area of operable windows or panels shall not be less than 40 square feet per 50 linear feet of perimeter.

Exceptions:

1. In Group R-1 occupancies, each guest room or suite having an exterior wall shall be permitted to be provided with 2 square feet of venting area in lieu of the area specified in item 1.
2. Windows shall be permitted to be fixed ~~tempered glass panes provided that no coating or film is applied that will modify the natural breaking characteristics of the glass~~, provided that glazing can be cleared by firefighters.
2. Mechanical air-handling equipment providing one exhaust air change every 40 15 minutes for the area involved. Return and exhaust air shall be moved directly to the outside without recirculation to other portions of the building.
3. Any other approved design that will produce equivalent results.

Committee Reason: The committee agreed that the proponent's reason statement accurately and adequately substantiates the need for the change which will provide the fire department with an effective tool for the removal of smoke from high-rise buildings during post-fire salvage and overhaul operations. The modification is a clearer statement of the desired performance characteristic of fixed windows.

Assembly Action:**None**

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Sarah A. Rice, C.B.O, Schirmer Engineering Corporation requests Approval as Modified by this public comment.

Further modify proposal as follows:

403.15 Smoke ~~removal~~ exhaust. To facilitate smoke removal in post-fire salvage and overhaul operations, buildings and structures shall be equipped with natural or mechanical ventilation for removal of products of combustion in accordance with one of the following:

1. Easily identifiable, manually operable windows or panels shall be distributed around the perimeter of each floor at not more than 50 foot intervals. The area of operable windows or panels shall not be less than 40 square feet per 50 linear feet of perimeter.

Exceptions:

1. In Group R-1 occupancies, each guest room or suite having an exterior wall shall be permitted to be provided with 2 square feet of venting area in lieu of the area specified in item 1.
2. Windows shall be permitted to be fixed provided that glazing can be cleared by firefighters.
3. Mechanical air-handling equipment providing one exhaust air change every 15 minutes for the area involved. Return and exhaust air shall be moved directly to the outside without recirculation to other portions of the building.
4. Any other approved design that will produce equivalent results.

Commenter's Reason: As stated in Committee Reason of the 2008 Report of the Public Hearings on the 2008 Editions of the International Code, the ventilation system being required is intended to ONLY "...provide the fire department with an effective tool for the removal of smoke from high-rise buildings during post-fire salvage and overhaul operations." (Entire Committee Reason is found below)

The proposed modification will make the provision clear and concise, therefore limiting the potential for misapplication.

The proposed change to the title is also intended to add clarity to the provision. The term "smoke exhaust" is used in 12 other places in the IBC, each with a little different meaning. The term "smoke removal" is only used in one other location in the IBC, and thus the potential for misapplication is reduced.

Committee Reason: The committee agreed that the proponent's reason statement accurately and adequately substantiates the need for the change which will provide the fire department with an effective tool for the removal of smoke from high-rise buildings during post-fire salvage and overhaul operations. The modification is a clearer statement of the desired performance characteristic of fixed windows.

Final Hearing Results

G64-07/08**AMPC**

Code Change No: **G65-07/08**

Original Proposal

Section: 403.15 (New), Chapter 35 (New)**Proponent:** Michael Gardner, Gypsum Association**1. Add new text as follows:**

403.15 Structural integrity of exit stairway enclosures and elevator shaft enclosures. For all buildings that are more than 420 feet (128 m) in height, exit stairway enclosures and elevator shafts enclosures shall comply with Sections 403.15.1 through 403.15.3.

403.15.1. Wall assembly. The wall assemblies making up the exit stairway enclosures and elevators shaft enclosures shall meet or exceed Soft Body Impact Classification Level 2 as measured by the test method described in ASTM C1629/C1629M.

403.15.2. Wall assembly materials. The face of the wall assemblies making up the exit stairway enclosures and elevator shaft enclosures that are not exposed to the interior of the exit stairway enclosure or elevator shaft enclosure shall be constructed in accordance with one of the following methods:

1. The wall assembly shall incorporate not less than two layers of impact-resistant construction board each of which meets or exceeds Hard Body Impact Classification Level 2 as measured by the test method described in ASTM C1629/C1629M.
2. The wall assembly shall incorporate not less than one layer of impact-resistant construction material that meets or exceeds Hard Body Impact Classification Level 3 as measured by the test method described in ASTM C1629/C1629M.
3. The wall assembly shall incorporate multiple layers of any material, tested in tandem, that meet or exceed Hard Body Impact Classification Level 3 as measured by the test method described in ASTM C1629/C1629M.

403.15.3. Other wall assemblies: An entire wall assembly that provides impact resistance equivalent to that required by Section 403.15.1 and the Hard Body Impact Classification Level 3 in ASTM C1629/C1629M shall be permitted.

2. Add standard to Chapter 35 as follows:**ASTM**

C1629/C1629M-06 Standard Classification for Abuse-Resistant Nondecorated Interior Gypsum Panel Products and Fiber-Reinforced Cement Panels

Reason: The intent of this proposal is to incorporate a reference to ASTM Standard C 1629 into the code. The standard was developed through the ASTM process to directly address impact-resistance requirements for materials that could be incorporated into stair and elevator enclosures in high rise construction.

By incorporating the reference to ASTM C 1629 a definitive method of establishing criteria to assess the impact-resistance of stair and elevator enclosures will be incorporated into the code. This is in contrast to recent proposals that have attempted to inappropriately impose specific requirements of the ASTM E 119 standard onto enclosure systems or that have proposed other arbitrary performance requirements for enclosure systems.

While the standard was developed to specifically test gypsum and fiber-reinforced cement panels, it can readily be used to test the impact resistance of other board and panel materials. In addition, it establishes specific values for the impact resistance of materials that can be used as a benchmark for the evaluation of other materials and systems.

This proposal directly reflects recent action by the City of New York. In July 2006, Section 32-05 of Chapter 32 of Title 1 of the Rules of the City of New York was adopted by the City of New York. Section 32-05 established criteria for the evaluation of stair enclosures in office building construction in New York City by incorporating a reference to the ASTM C 1629 standard. Rule 32 also established performance criteria for systems constructed using other materials.

This proposal takes the language adopted by the City of New York and modifies it for use in the IBC. In so doing, it eliminates much of the prescriptive language contained in Section 32-05 of the New York City text. That is intentional since much of the prescriptive language contained in Section 32-05 appears in other sections of or is incorporated by reference into the IBC.

The proposed Section 403.15 establishes that the language will apply only to buildings that are more than 420 feet in height and only to the exit stairway and elevator enclosures within those buildings. This is more restrictive than the New York City language which imposes the impact resistant requirements onto all office buildings regardless of size or height.

Section 403.15.1 directly mimics the New York City language that requires the entire assembly to withstand an impact resistance of 195 lbf as measured by the ASTM C 1629 Soft Body Impact Test. The test method used in C 1629 is conducted in accordance with the ASTM E 695 test method which covers the measurement of the relative resistance of wall, floor, and roof construction to impact loading.

Section 403.15.2 requires the face of the system that is not exposed to the shaft – the outside face - to be protected by a material or materials that comply with a level of impact resistance as established by the ASTM C 1629 Hard Body Impact Test. To comply with the proposed language at least two layers of Level 2 material or one layer of Level 3 material must be incorporated into the system. Level 2 material must withstand a Hard Body impact of 100 lbf to comply with the standard. Level 3 material must withstand a Hard Body impact of 150 lbf to comply with the standard.

The same section also permits the use of a system composed of multiple layers of different materials provided the composite system can comply with a Level 3 Hard Body test. The same concept is contained in the New York City language.

Section 403.15.3. is intended to permit monolithic systems, such as those constructed of masonry or concrete, to be evaluated using an available test method that will permit a quantifiable comparison with the performance requirements established by the proposed language. This is a change from the New York City language which specifically allows the use of masonry or concrete walls, but makes no provisions for other monolithic systems such as those constructed of plaster or other similar materials.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The committee generally agrees with this proposed enhancement of exit enclosure integrity, but as written it is specific for only one material. It would require other enclosure materials such as concrete and masonry to comply with a reference standard that is specific to panels of gypsum and fiber-reinforced cement.

Assembly Action:

None

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because public comments were submitted.

Public Comment 1:

Michael Gardner, Gypsum Association, requests Approval as Modified by this public comment.

Modify proposal as follows:

403.15.3.1. Concrete or masonry walls. Concrete or masonry walls shall be considered to have complied with the requirements of this section.

(Portions of proposal not shown remain unchanged)

Commenter's Reason: Committee reason statement for disapproval of the original proposal indicates that the structural committee agreed with the concept of enhanced exit enclosure integrity, but believed that the original proposal restricted material system options when it required concrete and masonry systems to comply with a gypsum board standard. Proposed modification rectifies committee concern by specifically stating that a concrete or masonry system complies with the intent of the overall proposed language and can be installed to satisfy the requirements of the section without the need for further testing.

Public Comment 2:

Steve Skalko, Portland Cement Association, requests Approval as Modified by this public comment.

Modify proposal as follows:

403.15 Structural integrity of exit stairway enclosures and elevator shaft hoistway enclosures. For buildings of occupancy category III or IV in accordance with Table 1604.5 with an occupied floor located more than 75 feet (22 860 mm) above the lowest level of fire department vehicle access, and for all buildings that are more than 420 feet (128 m) in height, exit stairway enclosures and elevator shaft hoistway enclosures shall comply with Sections 403.15.1 through 403.15.34.

403.15.1. Wall assembly. The wall assemblies making up the exit stairway enclosures and elevator shaft hoistway enclosures shall meet or exceed Soft Body Impact Classification Level 2 as measured by the test method described in ASTM C1629/C1629M.

403.15.2. Wall assembly materials. The face of the wall assemblies making up the exit stairway enclosures and elevator shaft hoistway enclosures that are not exposed to the interior of the exit stairway enclosure or elevator shaft hoistway enclosure shall be constructed in accordance with one of the following methods:

1. The wall assembly shall incorporate not less than two layers of impact-resistant construction board each of which meets or exceeds Hard Body Impact Classification Level 2 as measured by the test method described in ASTM C1629/C1629M.
2. Wall assembly shall incorporate not less than one layer of impact-resistant construction material that meets or exceeds Hard Body Impact Classification Level 3 as measured by the test method described in ASTM C1629/C1629M.
3. The wall assembly shall incorporate multiple layers of any material, tested in tandem, that meet or exceed Hard Body Impact Classification Level 3 as measured by the test method described in ASTM C1629/C1629M.

403.15.3 Concrete and masonry walls: Concrete or masonry walls shall be deemed to satisfy the requirements of Sections 403.15.1 and 403.15.2.

~~403.15.3~~ **403.15.4 Other Wall Assemblies:** ~~An entire~~ Any other wall assembly that provides impact resistance equivalent to that required by Section 403.15.1 and ~~the~~ Section 403.15.2 for Hard Body Impact Classification Level 3 in ASTM 1629/C1629M shall be permitted.

(Portions of proposal not shown remain unchanged)

Commenter's Reason: Hardening of exit enclosures and elevator hoistways is an important fire safety feature that is presently lacking in the code. G65 presents an approach to add this feature to the IBC however it needs additional modifications to fully address high rise buildings where this feature would be important to the occupants.

For example, occupancy category III and IV structures less than 420 feet in height may be at higher risk than some category II structures greater than 420 feet in height; therefore, occupants of these structures deserve the additional protection proposed for taller buildings. The height threshold being proposed for category III and IV buildings is the same as the existing threshold for high rise buildings (see Section 403.1).

By deleting the word "stairway" in the proposal, exit passageways (see Section 1021) which are commonly used to connect offset exit stairs will also be required to be "hardened" the same as the stairs they connect. This insures continuity of the hardened exit enclosure for the full length until an occupant reaches the exit discharge. In addition the change from "shaft" to "hoistway" is for consistency with other code provisions (e.g., see Chapter 30).

Finally, as noted in the last paragraph of the proponent's reason, the NYC rule permits concrete or masonry enclosures without further testing. However, Section 403.15.3 of G65 will require concrete or masonry walls to be tested to some unknown standard that is equivalent to C1629. Presumably NYC determined that concrete or masonry walls normally used to enclose exits and elevator hoistways meet the intent of their rule. This modification will exempt concrete and masonry walls from being subjected to unnecessary tests.

Below is the pertinent section from the NYC rule upon which G65 was based.

Concrete and masonry walls. Concrete or masonry walls shall satisfy the impact resistance requirements of this section provided that the enclosure walls are anchored to structural members that provide lateral support as required by the seismic provisions of RS 10. The assembly shall be rated for two-hour fire resistance, as measured by the method described in ASTM E119.

Final Hearing Results

G65-07/08

AMPC1, 2

Code Change No: G68-07/08

Original Proposal

Section: 403.18

Proponent: Tony Crimi, A.C. Consulting Solutions, Inc., representing the North American Insulation Manufacturer's Association (NAIMA)

Revise as follows:

403.18 (Supp) Sprayed fire-resistive materials (SFRM). The bond strength of the SFRM installed throughout the building shall be in accordance with Table 403.18.

Reason: To clarify the requirements in Section 403.18 (2007 Supplement) of the IBC in the previous cycle by proposal G68-06/07 on SFRM bond strength.

Because of the way that the new Table 403.18 is structured, there has been confusion regarding the interpretation of the SFRM bond strength requirements for buildings over 75 ft and 420 ft in height. This proposal intends to clarify that where the SFRM is installed, the bond strengths specified in 403.18 are required to be achieved throughout the height of the building, and not just on those portions of the building exceeding the heights specified in the Table.

Code change proposal G68-06/07 was submitted in the last cycle by the International Code Council Ad Hoc Committee on Terrorism Resistant Buildings. The purpose of this proposal was to increase the required adhesions of Spray Applied Fire Resistant Materials (SFRM). Recommendation 6 of the National Institute of Standards and Technology's (NIST) investigation Report into the World Trade Center (WTC) tragedy called for improvement of the in-place performance of SFRM. The Ad Hoc Committee on TRB demonstrated that these higher standards are warranted by the higher risk associated with taller buildings.

However, the language in Section 403.18 (2007 Supplement) has caused some confusion because it does not explicitly state that the higher bond strength material for buildings over 75 feet in height and for buildings exceeding 420 feet applies throughout those buildings. As an example, where SFRM is installed in a building which is 100 ft in height above the lowest level of fire department vehicle access, the SFRM is required to have a bond strength of 430 psf as specified by Table 403.18 throughout the height of the building, and not only on the uppermost 25 ft of building height.

This Code change clarifies the requirement for higher bond strength material for buildings over 75 feet in height and yet again higher strength for those that exceed 420 feet.

Bibliography: National Institute of Standards and Technology. Final Report of the National Construction Safety Team on the Collapses of the World Trade Center Towers. United States Government Printing Office: Washington, D.C. September 2005.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

This code change was heard by the IBC Fire Safety Code Development Committee.

Committee Action:

Approved as Submitted

Committee Reason: The committee agreed that this proposal clarifies that where the sprayed fire-resistive materials (SFRM) are installed, the bond strengths specified in 403.18 are required to be achieved throughout the height of the building, and not just on those portions of the building exceeding the heights specified in Table 403.18.

Assembly Action:

None

Final Hearing Results

G68-07/08

AS

Code Change No: G74-07/08

Original Proposal

Section: 404.5

Proponent: Raymond A. Grill, PE, Arup, representing himself

Revise as follows:

404.5 (Supp) Enclosure of atriums. Atrium spaces shall be separated from adjacent spaces by a 1-hour fire barrier constructed in accordance with Section 706 or a horizontal assembly constructed in accordance with Section 711, or both.

Exceptions:

1. A glass wall forming a smoke partition where automatic sprinklers are spaced 6 feet (1829 mm) or less along both sides of the separation wall, or on the room side only if there is not a walkway on the atrium side, and between 4 inches and 12 inches (102 mm and 305 mm) away from the glass and designed so that the entire surface of the glass is wet upon activation of the sprinkler system without obstruction. The glass shall be installed in a gasketed frame so that the framing system deflects without breaking (loading) the glass before the sprinkler system operates.
2. A glass-block wall assembly in accordance with Section 2101.2.5 and having a 3/4-hour fire protection rating.
3. The adjacent spaces of any three floors of the atrium shall not be required to be separated from the atrium where such spaces are ~~included~~ considered in the design of the smoke control system.

Reason: The current language implies that the volume of floors open to the atrium need to be included in the atrium exhaust system regardless of the geometry or other factors. This language has been interpreted to require things like even distribution of makeup air and exhaust throughout floors open to an atrium. This could lead to not having appropriate exhaust volume in the atrium space itself. Methods for determining

appropriate exhaust rates for atriums are driven by maintaining the calculated smoke layer 6 feet above the egress path. If the fire is considered to be on a floor open to the atrium, this criteria could never be met. In some jurisdictions, it has been utilized to eliminate atrium designs for buildings. This was not the intent of the provision.

Spaces open to the atrium should be considered from a fire safety perspective in the design of the overall space and should be addressed in the rational analysis which is required to be prepared as a basis for design for smoke control systems.

Cost Impact: This code change will not increase the cost of construction.

Analysis: An errata occurred in the 2007 Supplement. The reference in Section 404.5, Exception 2 is Section 2101.2.5 instead of 2110.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The proposed language is clearer as to what is intended by the code for spaces open to the atrium with respect to smoke control design.

Assembly Action:

None

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because public comments were submitted.

Public Comment 1:

Maureen Traxler, City of Seattle Department of Planning and Development, requests Approval as Modified by this public comment.

Modify proposal as follows:

404.5 (Supp) Enclosure of atriums. Atrium spaces shall be separated from adjacent spaces by a 1-hour fire barrier constructed in accordance with Section 706 or a horizontal assembly constructed in accordance with Section 711, or both.

Exceptions:

1. A glass wall forming a smoke partition where automatic sprinklers are spaced 6 feet (1829 mm) or less along both sides of the separation wall, or on the room side only if there is not a walkway on the atrium side, and between 4 inches and 12 inches (102 mm and 305 mm) away from the glass and designed so that the entire surface of the glass is wet upon activation of the sprinkler system without obstruction. The glass shall be installed in a gasketed frame so that the framing system deflects without breaking (loading) the glass before the sprinkler system operates.
2. A glass-block wall assembly in accordance with Section 2101.2.5 and having a 3/4-hour fire protection rating.
3. The adjacent spaces of any three floors of the atrium shall not be required to be separated from the atrium where such spaces are ~~considered~~ accounted for in the design of the smoke control system.

Commenter's Reason: This proposed modification is meant to further the intent of the original proposal. We agree that it might not be appropriate to include the adjacent spaces in the smoke control system's design. However, it may not be adequate merely to "consider" them. When a building department reviews a smoke control design, we want to know how those adjacent spaces are treated in the design. If they aren't "included" as part of the atrium, the design should show how the calculations take them into account.

Final Hearing Results

G74-07/08

AMPC

Code Change No: G75-07/08

Original Proposal

Section: 404.8

Proponent: Raymond A. Grill, PE, Arup, representing himself

Revise as follows:

404.8 Travel distance. In other than the lowest level of the atrium, where the required means of egress is through the atrium space, the portion of exit access travel distance within the atrium space shall not exceed 200 feet (60 960 mm). The travel distance requirements for areas of buildings open to the atrium and where access to the exits is not through the atrium, shall comply with the requirements of Chapter 10.

Reason: The change clarifies the intent of the code. This is consistent with the language in the *Uniform Building Code Handbook* which is a legacy code to the IBC. The discussion is located on Page 51 of the 1997 UBC Handbook.

Cost Impact: This code change will not increase the cost of construction.

Public Hearing Results

Committee Action:**Approved as Submitted**

Committee Reason: The proposal clarifies the code with regard to the egress requirements for atriums. More specifically, if the space does not exit through the atrium compliance with travel distance requirements is intended to be in accordance with Chapter 10.

Assembly Action:**None**

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Lori Lee Graham, City of Portland, OR, representing herself, requests Approval as Modified by this public comment.

Modify proposal as follows:

404.8 Travel distance. In other than the lowest level of the atrium, where the required means of egress is through the atrium space, the portion of exit access travel distance within the atrium space shall not exceed 200 feet (60 960 mm). The travel distance requirements for areas of buildings open to the atrium and where access to the exits is not through the atrium, shall comply with the requirements of ~~Chapter 10~~ Section 1016.

Commenter's Reason: The issue is travel distance. The referral needs to only be back to travel distance section 1016, not to the whole of Chapter 10. The broader reference is confusing.

Final Hearing Results

G75-07/08**AMPC**

Code Change No: G76-07/08

Original Proposal

Sections: 406.2.3, 406.2.4, 406.3.3, 1607.7, 1607.7.3, Table 1607.1

Proponent: Edwin Huston, National Council of Structural Engineers Association (NCSEA), representing the NCSEA Code Advisory Committee – General Engineering Subcommittee

Revise as follows:

406.2.3 Guards. ~~Guards shall be provided in accordance with Section 1013 at exterior and interior vertical openings on floor and roof areas where vehicles are parked or moved and where the vertical distance to the ground or surface directly below exceeds 30 inches (762 mm).~~ Guards serving as vehicle barrier systems shall comply with Sections 406.2.4 and 1013.

406.2.4 Vehicle barriers systems. ~~Parking areas shall be provided with exterior or interior walls or vehicle barriers, except at pedestrian or vehicular accesses, designed in accordance with Section 1607.7. Vehicle barriers systems not less than 2 feet (607 mm) high shall be placed at the end of drive lanes, and at the end of parking spaces where the difference in adjacent floor elevation vertical distance to the ground or surface directly below is greater than 1 foot (305 mm).~~ Vehicle barrier systems shall comply with the loading requirements of Section 1607.7.3.

406.3.3 Construction. Open parking garages shall be of Type I, II or IV construction. Open parking garages shall meet the design requirements of Chapter 16. For vehicle barriers systems; see Section 406.2.4.

1607.7 Loads on handrails, guards, grab bars and vehicle barriers systems. Handrails, guards, grab bars as designed in ICC A117.1 and vehicle barriers systems shall be designed and constructed to the structural loading conditions set forth in this section.

1607.7.3 Vehicle barriers systems. Vehicle barrier systems for passenger cars shall be designed to resist a single load of 6,000 pounds (26.70 kN) applied horizontally in any direction to the barrier system and shall have anchorage or attachment capable of transmitting this load to the structure. For design of the system, the load shall be assumed to act at a minimum height of 1 foot, 6 inches (457 mm) above the floor or ramp surface on an area not to exceed 1 square foot (305 mm²), and is not required to be assumed to act concurrently with any handrail or guard loadings specified in the preceding paragraphs of Section 1607.7.1. Garages accommodating trucks and buses shall be designed in accordance with an approved method that contains provision for traffic railings.

TABLE 1607.1 (Supp)

MINIMUM UNIFORMLY DISTRIBUTED LIVE LOADS AND MINIMUM CONCENTRATED LIVE LOADS

OCCUPANCY OR USE	UNIFORM (psf)	CONCENTRATED (lbs.)
39. Vehicle barriers <u>system</u>	See Section 1607.7.3	

(Portions of table and footnotes not shown remain unchanged)

Reason: Section 406.2.3 - The suggested change deletes ambiguous text and defers to Section 1013 for where guards are required. The added sentence makes it clear that guards serving as vehicle barrier systems must comply with requirements for both systems.

Section 406.2.4 - The existing first sentence is not needed since Section 406.2.3 clearly indicates that any edge of a floor that is open to the floor or surface below must be provided with a guard, which may be a wall (see Section 1013). The second sentence is being retained and revised to recognize that the surface below the parking surface may not be another floor, but may be the ground. The new sentence being added at the end retains provisions in the existing first sentence.

Other changes are editorial for consistency in terminology.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The proposal clarifies the application of the code. The proponent's reason statement provided adequate substantiation.

Assembly Action:

None

Final Hearing Results

G76-07/08

AS

Code Change No: **G77-07/08**

Original Proposal

Sections: 406.2.4, 1607.7.3

Proponent: Donald R. Monahan, Walker Parking Consultants, representing the Parking Consultants Council of the National Parking Association

THESE PROPOSALS ARE ON THE AGENDA OF THE IBC GENERAL AND IBC STRUCTURAL CODE DEVELOPMENT COMMITTEES AS 2 SEPARATE CODE CHANGES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IBC GENERAL

Revise as follows:

406.2.4 Vehicle barriers. Parking areas shall be provided with exterior or interior walls or vehicle barriers, except at pedestrian or vehicular accesses, designed in accordance with Section 1607.7. Vehicle barriers not less than 2 feet 9 inches (~~607~~ 835 mm) high shall be placed at the end of drive lanes, and at the end of parking spaces where the difference in adjacent floor elevation is greater than 1 foot (305 mm).

Exception: Vehicle storage compartments in a mechanical access parking garage.

PART II – IBC STRUCTURAL

Revise as follows:

1607.7.3 Vehicle barriers. Vehicle barrier systems for passenger cars shall be designed to resist a single load of 6,000 pounds (26.70 kN) applied horizontally in any direction to the barrier system and shall have anchorage or attachment capable of transmitting this load to the structure. For design of the system, two loading conditions shall be analyzed. The first condition shall apply the load shall be assumed to act at a minimum height of 1 foot, 6 inches (457 mm) above the floor or ramp surface. The second loading condition shall apply the load at 2 feet, 3 inches (686 mm) above the floor or ramp surface. The more severe load condition shall govern the design of the barrier restraint system. The load shall be assumed to act on an area not to exceed 1 square foot (305 mm²), and is not required to be assumed to act concurrently with any handrail or guard loadings specified in the preceding paragraphs of Section 1607.7.1. Garages accommodating trucks and buses shall be designed in accordance with an approved method that contains provision for traffic railings

Reason: The current code provisions for vehicle barriers are outdated and need to be revised to account for the increased presence of trucks, vans and sport utility vehicles inside parking structures.

The latest vehicle sales data available clearly shows the following: Approximately 50% of the vehicles sold in 2006 are light trucks, vans or SUV's (LTVSUV's); these vehicles have bumper heights (front bumper) well in excess of the 18 inches above the pavement that the current code requires for the load application. Bumper height data is available from organizations such as Consumer Reports. We used such data as a guide and measured a representative sample of 50 out of the 135+ vehicle types for LTVSUV's. We also analyzed 2006 sales data for the 175+ vehicle types for passenger automobiles and calculated the bumper load height that would represent the 85th percentile based on sales. We determined that a 27-inch bumper height should be used. Vehicles such as the Nissan Armada, Hummer H3, Ford F150 and Jeep Commander are representative of vehicles with the 27 inch bumper height.

The attached sales table (Table 1) clearly shows the following:

The current code requirement of 18 inches covers only 52% of the vehicles on the road. The proposed 27 inch requirement would cover 96% of vehicles on the road. The bumper height appears to converge on the 27 inch proposed and the 4% of vehicles not covered have bumper heights only 2 inches taller. We measured only one rare model with a height much higher than 27": a Hummer H3 with a lift kit which measured 34 inches. We believe the 27 inch proposed requirement is reasonable and is substantiated by sales and measured bumper data.

Note that the barrier restraint may be horizontal or vertical, may be anchored at the bottom or at the ends. Therefore, one cannot determine in advance whether load condition #1 or load condition #2 will represent the most severe condition governing the design. Therefore, both load conditions should be specified.

In the 1960's and 1970's, a number of accidents occurred in parking garages and open parking structures where passenger vehicles went through the exterior walls and often over the edge of the parking facility with severe injury and often death to the vehicle occupants. These events coincided with the building boom of self-park parking facilities where the driver parked his/her own vehicle.

At that time, some of the state and city building codes had design requirements for the barrier restraints, sometimes called bumper walls or guard rails. However, the commonly used model building codes such as the Uniform Building Code (UBC) by the International Conference of Building Officials mainly used in the West, the BOCA Code by the Building Officials & Code Administrators International used in the Midwest and East, and the Standard Building Code (SBC) by the Southern Building Code Congress International used mainly in the Southeast had no specific provisions for the design of barrier restraints in multistory parking facilities. Several state codes including the New York, Wisconsin, Kentucky and Ohio codes did have barrier restraint barrier requirements. Ohio requirements were 500 pounds per lineal foot at 18 inches above the floor at the ends of parking spaces and 1000 pounds per lineal foot at 18 inches above the floor at the ends of drive aisles.

To fill this lack of consensus on the proper method to design parking facility barrier restraints, the Parking Consultants Council (PCC) of the National Parking Association (NPA) formed in the mid 1970's a Building Code Committee to develop *Recommended Building Code Provisions for Open Parking Structures*. This document was published in July 1980.

Regarding barrier restraints, the committee made a survey of NPA members, who are mainly parking facility operators, asking for information and experience with barrier restraint failures. This information showed that where rational design methods had been used with as low as a 2000 pound horizontal load applied against a barrier in a parking space, no failures had occurred. However, failures had occurred where unreinforced masonry walls, pipe railings, precast concrete wheel stops, and similar restraints had been used.

The PCC Building Code Committee also obtained proprietary test data of mid-1970's vintage from the Automotive Research Laboratories at the University of Michigan, Ann Arbor, Michigan. This testing was for the energy absorption of passenger vehicle bumper systems. The goal of the testing was to set a standard for the manufacture of passenger vehicle bumper systems such that for a vehicle striking a wall in a perpendicular manner at a maximum speed of 5 miles-per-hour, it would sustain little or no damage. Also, the maximum weight of a passenger vehicle at that time was approximately 5000 pounds. Based on this information and with the assistance of the Structural Engineering Department at the University of Michigan, a static ultimate horizontal design point load of 10,000 pounds located 18 inches above the floor was developed as the criteria for the design of parking structure barrier restraint systems.

It should be noted that the act of a bumper wall resisting a vehicle striking it is truly a dynamic energy problem—not a static load problem. However, building codes at that time used percentages of static loads to allow for the impact effects on structures. Thus, the use of the 10,000 pound ultimate horizontal static load was deemed appropriate for a 5,000-pound vehicle traveling at a speed of 5 mph.

Therefore, in 1980, the PCC Code Committee developed the following for the design of barrier restraints, "*Barrier railings should be placed at the ends of drive lanes and at the ends of parking spaces at the perimeter of the structure and at the end of parking spaces where the difference in floor elevation is greater than one foot. Barrier railings should be not less than two feet in height and should be designed for a minimum horizontal ultimate load of 10,000 pounds applied at a height of one foot six inches above the floor at any point along the structure.*" A footnote stated, "*It is the intent that the horizontal load be considered as applied over a one-foot square area with the load distributed through the barrier railing system into the main structural elements in a manner which is logical and appropriate for the barrier railing system under consideration.*"

The PCC barrier rail recommendation was first adopted by the ICBO in the 1990 UBC Supplement. Many multistory parking structures designed prior to 1990 did not meet this requirement. Similar language was incorporated into a number of the model building codes with, in some cases, the load being changed from a 10,000 pound ultimate load to a 6,000 pound service load. The 6000 pound service load with the proper load factor is approximately the same as the 10,000 pound ultimate or factored load.

Barrier Restraint Modifications

During the 10 year period from 1996 to 2006, 13 incidents have been documented (see Table 1) where standard automobiles impacted barrier walls, rails or restraints of parking garages with such force that the barrier systems failed resulting in the deaths of 16 people. A number of the accidents appear to have occurred when the driver hit the accelerator rather than the brake pedal. Most of the failures were in parking structures designed and built prior to the 1980 design recommendations or prior to the 1990 code requirement, and had inadequate barrier restraints including faulty installation of barrier cables and unreinforced masonry walls. Wheel stops or curbs used in many of these facilities were ineffective at stopping the vehicle. Those failures have caused the Parking Consultants Council of the National Parking Association to re-evaluate the design requirements for barrier rail systems.

The characteristics of the passenger vehicle have changed dramatically in the last 27 years. Approximately 50% of the passenger vehicles sold in 2006 consist of light trucks (less than 10,000 pounds Gross Vehicle Weight), vans or SUV's. Those vehicles have a bumper height well in excess of the 18 inch height of load application required by the current building code. An analysis of automobile sales data (see Table 2) indicates the current code requirement of 18 inches only covers 52% of the vehicles. A bumper height of 27 inches would cover 96% of passenger vehicles.

In addition to revising the bumper height used in designing barrier restraints for parking structures, the applied load may also need to be revised. Light trucks and SUV's are heavier than the typical automobile. The empty weight of a Lincoln Navigator, a large sport utility vehicle (SUV), is approximately 7,000 pounds. Some large pick-up trucks have gross (loaded) weights of up to 10,000 pounds.

Also, the speed at point of impact may have to be reconsidered. At least one of the failure incidents reported a speed of 10 to 14 mph compared to a speed of 5 mph used to determine the current load requirement.

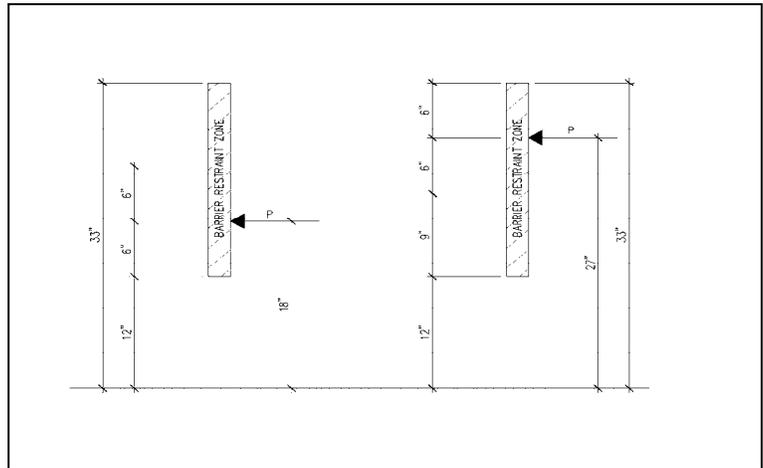


Figure 1. Bumper Load Application

Finally, the design methodology may have to be revised. The key to vehicle impact restraint design is to absorb and dissipate the kinetic energy created by the moving vehicle impacting the barrier. The kinetic energy is created by a combination of the vehicle speed or velocity and the vehicle weight where $KE=1/2mv^2$.

This energy is absorbed by a combination of:

- The weight of the resisting element such as a concrete bumper wall,
- the instantaneous elastic or plastic deflection of the wall,
- the crushing or movement of the vehicle components such as bumper energy absorption system, crushing of vehicle fenders, etc.

This is a complex dynamics problem—not unlike designing a building structure for an earthquake.

Summary

A review of the history of vehicle barrier restraint systems shows that systems designed for the 10,000 pound horizontal ultimate static impact load are adequate if proper provision is made to provide toughness and ductility in the barrier restraints and the related connection systems. The connections must be able to extend and deform to absorb impact energy prior to ultimate failure or disconnecting.

Strand or cable barrier systems can perform adequately if they are properly designed, installed, and maintained.

Recent vintage passenger vehicles including SUV's and pick-up trucks are heavier than their predecessors with average bumper heights greater than 18 inches. Loading and height adjustments should be made to provide proper barrier restraint for these heavier and taller vehicles.

Table 1. Parking Structure Vehicle Barrier Failure Incidents

Facility Name & Location	Year of Incident	Year Built	Barrier Type	Description of Incident
1 Second & Union, Seattle, WA	1987	1969	Concrete curb and cables	3 dead from vehicle falling from fifth floor
2 Claridge Casino, Atlantic City, NJ	1996	1996	Cable Rail	2 dead in vehicle fall from 4th floor, faulty cable installation
3 Pittsburgh, PA	1999	1965	Wheel stops and 3' metal panel	Woman survived vehicle fall from 7th floor
4 Sandcastle Resort, Virginia Beach, VA	2000	1985	Concrete block wall	4 dead in vehicle fall from 5th floor
5 Howard Johnson's Hotel, Ocean City, MD	2002	Unknown	Wheel stops and Cable Rail	2 dead in vehicle fall from 4th floor
6 Golden Nugget, Las Vegas, NV	Jan. 2004	Unknown	Concrete curb and wall	2 dead in vehicle fall from 4th floor
7 City Park Mall, Ft. Lauderdale, FL	2004	1982	Concrete block wall	1 dead in vehicle fall from 5th floor
8 Golden Nugget, Las Vegas, NV	Oct. 2004	Unknown	Concrete curb and wall	2 seriously injured in vehicle fall from 2nd floor
9 Miami, FL	2004	Unknown	Concrete wall	Man injured in vehicle fall from 5th floor
10 Riverpark Square, Spokane, WA	2006	1973	Wheel stops and concrete spandrel wall	1 dead in vehicle fall from 5th floor
11 Lexington, KY	2006	1975	Precast concrete spandrels	Pedestrian killed on sidewalk when spandrel fell from garage after vehicle impact
12 Los Angeles, CA	2007	Unknown	Unknown	Woman injured in vehicle fall from 4th floor
13 Houston, TX	2007	Unknown	Masonry Wall	1 dead in vehicle fall from 5th floor
14 Chumash Casino, CA	2007	Unknown	Concrete Wall	Concrete wall damaged severely, but did not fail. No injuries.

Source: Parking Consultants Council of the National Parking Association, August 2007

CODE CHANGES RESOURCE COLLECTION – INTERNATIONAL BUILDING CODE

Table 2. Bumper Height Analysis for 2007 Car, Truck, SUV and Minivan Models							
July 26th, 2007							
2007 Vehicle Models	Curb Weight (lb)	Payload (lb)	Gr. Veh. Wt (lb)	Bumper Middle Point Height (in)	2006 Vehicle Sales	Percentile	Notes
GMC Acadia	5,070	1,320	6,390	10	480	0.00%	
GMC Yukon XL	5,935	1,460	7,395	14	45,413	0.28%	
Dodge Ram 3500	6,588	2,300	8,888	14	182,089	1.37%	
GMC Sierra 1500	5,360	1,570	6,930	15	210,736	2.64%	
GMC Yukon	5,715	1,580	7,295	16	71,476	3.07%	
Lincoln Navigator	6,245	1,525	7,770	17	23,947	3.21%	
Mercedes-Benz R-Class	5,120	1,060	6,180	18	18,168	3.32%	
Car Models (175)	N/A	N/A	N/A	18	8,129,582	52.25%	Car Models (175), the current code requirement
Dodge Grand Caravan	4,515	1,185	5,700	19	211,140	53.53%	
Chrysler Town & Country	4,515	1,185	5,700	19	159,105	54.48%	
Mercedes-Benz M-Class	4,845	1,165	6,010	19	31,632	54.67%	
Honda Odyssey	4,615	1,320	5,935	19	177,919	55.74%	
Toyota Sienna	4,415	1,120	5,535	19	163,269	56.73%	
Chrysler Aspen	5,335	1,260	6,595	20	7,656	56.77%	
Ford Explorer	4,905	1,275	6,180	21	179,229	57.85%	
Chevrolet Express	5,015	3,254	8,269	22	123,195	58.59%	
Chevrolet Equinox	3,880	1,115	4,995	22	113,888	59.28%	
Chevrolet Trailblazer	4,830	1,020	5,850	23	174,797	60.33%	
Ford Econoline	5,505	3,215	8,720	23	180,457	61.42%	
Honda CRV	3,505	850	4,355	23	170,028	62.44%	
Ford Escape	3,575	950	4,525	23	157,395	63.39%	
Toyota RAV 4	3,485	825	4,310	23	152,047	64.30%	
GMC Sierra 2500	6,000	3,795	9,795	23	105,368	64.94%	
Cadillac Escalade	5,810	1,330	7,140	24	62,206	65.31%	
Chevrolet Avalanche	6,010	1,230	7,240	24	57,076	65.66%	
Chevrolet Suburban	5,935	1,460	7,395	24	77,211	66.12%	
Chevrolet Tahoe	5,715	1,580	7,295	24	161,491	67.09%	
Mercedes-Benz GL-Class	5,575	1,210	6,785	24	18,776	67.21%	
Volvo XC90	4,950	1,210	6,160	24	33,200	67.40%	
Toyota Highlander	4,035	1,160	5,195	24	129,794	68.19%	
Lexus RX	4,235	925	5,160	24	108,348	68.84%	
Toyota 4 Runner	4,345	1,035	5,380	24	103,086	69.46%	
Hummer H3	4,700	1,150	5,850	24	54,052	69.78%	
Chevrolet Silverado 1500	5,360	1,570	6,930	25	636,069	73.61%	
Dodge Durango	5,335	1,260	6,595	25	70,606	74.04%	
Dodge Ram 1500	5,300	1,350	6,650	25	182,089	75.13%	
Ford Expedition	6,245	1,570	7,815	25	87,203	75.66%	
Toyota Tundra	5,740	1,395	7,135	25	124,508	76.41%	
Volkswagen Touareg	5,210	1,280	6,490	25	10,163	76.47%	
Jeep Grand Cherokee	4,725	1,100	5,825	25	139,148	77.31%	
Nissan Pathfinder	4,875	1,125	6,000	26	73,124	77.75%	
Nissan Titan	5,380	1,105	6,485	26	72,192	78.18%	
Honda Pilot	4,535	1,320	5,855	26	152,154	79.10%	
Jeep Liberty	4,125	1,150	5,275	26	133,557	79.90%	
Ford F-150	5,620	1,510	7,130	27	398,020	82.30%	
Jeep Commander	5,245	1,100	6,345	27	88,497	82.83%	
Nissan Armada	5,715	1,375	7,090	27	32,864	83.03%	85th Percentile Vehicle
87 Additional Truck/SUV/Minivan Models	N/A	N/A	N/A	27	2,188,867	96.20%	87 Additional Truck/SUV/Minivan Models
Hummer H2	6,400	2,200	8,600	27	17,107	96.30%	
Ford F-250	8,080	1,905	9,985	28	398,020	98.70%	
Toyota Sequoia	5,280	1,320	6,600	28	34,315	98.91%	
Toyota Tacoma	4,115	1,100	5,215	28	178,351	99.98%	
Toyota Land Cruiser	5,435	1,240	6,675	29	3,376	100.00%	
Total 2006 Vehicle Sales					16,614,484		

Total Number of Vehicles	16,614,484	
Number of vehicles that would be included when using the 85th percentile bumper height	15,983,316	96%
Number of vehicles covered by the current requirement of 18 inches	8,681,891	52%
Number of vehicles not covered by the current code provisions	7,932,594	48%
Number of vehicles not covered by the proposed code Including data for the additional 87 models for LTVSUV's that are also 27 inches	631,169	4%

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing Results

PART I – IBC GENERAL

Committee Action:

Approved as Submitted

Committee Reason: This revision provides more detail to designers and updates the code to address the actual size of cars currently found in parking garages.

Assembly Action:

None

PART II – IBC STRUCTURAL

Committee Action:

Approved as Submitted

Committee Reason: The proposed addition of a second loading condition for designing vehicle barriers is warranted based on the data that was provided by the proponent.

Assembly Action:

None

Final Hearing Results

G77-07/08, Part I

AS

G77-07/08, Part II

AS

Code Change No: G80-07/08

Original Proposal

Section: 406.3.6

Proponent: Raymond A. Grill, PE, Arup, representing himself

Revise as follows:

406.3.6 (Supp) Area and height increases. The allowable area and height of open parking garages shall be increased in accordance with the provisions of this section. Garages with sides open on three-fourths of the building's perimeter are permitted to be increased by 25 percent in area and one tier in height. Garages with sides open around the entire building's perimeter are permitted to be increased by 50 percent in area and one tier in height. For a side to be considered open under the above provisions, the total area of openings along the side shall not be less than 50 percent of the interior area of the side at each tier and such openings shall be equally distributed along the length of the tier.

Allowable tier areas in Table 406.3.5 shall be increased for open parking garages constructed to heights less than the table maximum. The gross tier area of the garage shall not exceed that permitted for the higher structure. At least three sides of each such larger tier shall have continuous horizontal openings not less than 30 inches (762 mm) in clear height extending for at least 80 percent of the length of the sides and no part of such larger tier shall be more than 200 feet (60 960 mm) horizontally from such an opening. In addition, each such opening shall face a street or yard accessible to a street with a width of at least 30 feet (9144 mm) for the full length of the opening, and standpipes shall be provided in each such tier.

Open parking garages of Type II construction, with all sides open, shall be unlimited in allowable area where the building height does not exceed 75 feet (22 860 mm). For a side to be considered open, the total area of openings along the side shall not be less than 50 percent of the interior area of the side at each tier and such openings shall be equally distributed along the length of the tier. All portions of tiers shall be within 200 feet (60 960 mm) horizontally from such openings or other natural ventilation openings as defined in Section 406.3.3.1. These openings shall be permitted to be provided in courts with a minimum ~~width~~ dimension of ~~30~~ 20 feet (~~9144~~ 6096 mm) for the full width of the openings.

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Reason: There was no technical basis for the 30 foot width when it was added to the code. It was noted as a conservative number. The Code currently provides a basis for the 20 width. Footnote d to Table 704.8 allows unlimited unprotected openings when the fire separation is 10 foot or greater. A 20 foot minimum dimension for a court may still be a conservative number, but at least correlates with other provisions in the code.

Cost Impact: This code change will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The current value of 30 feet was felt to be too conservative and inconsistent with other code requirements. The committee felt that changing to the value to 20 would be a reasonable revision.

Assembly Action:

None

Final Hearing Results

G80-07/08

AS

Code Change No: **G82-07/08**

Original Proposal

Section: 407.8 (New), Chapter 35 (New)

Proponent: Tom Lariviere, Fire Department, Madison, MS, representing the Joint Fire Service Review Committee

1. Add new text as follows:

407.8 Hyperbaric facilities. Group I-2 occupancies containing hyperbaric equipment shall meet the requirements contained in Chapter 19 of NFPA 99.

2. Add standard to Chapter 35 as follows:

NFPA 99–05 Standard for Health Care Facilities

Reason: This proposal will provide a reference standard and guidance for the installation of hyperbaric chambers into Group I-2 occupancies. This will only apply to Group I-2 occupancies and then only when a hyperbaric chamber is installed. This proposal will provide guidance for the designer and the code official regarding the installation and construction of the room containing hyperbaric chambers.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Analysis: Review of proposed new standard NFPA 99-05 indicated that, in the opinion of ICC Staff, the standard **did** comply with ICC standards criteria. This standard is already referenced in the IFC.

Committee Action:

Disapproved

Committee Reason: It is unclear if the requirements intended by the reference to the standard were only for installation of hyperbaric equipment or was intended to be a more extensive reference to the standard. Also, it appears that the proposal incorrectly references Chapter 19 instead of Chapter 20 of the standard.

Assembly Action:

None

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because public comments were submitted.

Public Comment 1:

Tom Lariviere, Fire Department, Madison, MS, representing the Joint Fire Service Review Committee, requests Approval as Modified by this public comment.

Modify proposal as follows:

407.8 Hyperbaric facilities. Hyperbaric facilities in Group I-2 occupancies containing hyperbaric equipment shall meet the requirements contained in Chapter 20 of NFPA 99.

NFPA

99-05 Standard for Health Care Facilities

Commenter's Reason: This item was disapproved by the Code Development Committee for two reasons. First, the referenced chapter should have been Chapter 20 of NFPA 99. The correction has been made to reference Chapter 20.

Secondly, there was uncertainty whether the entire Group I-2 facility needed to comply, or just the hyperbaric chamber. The hyperbaric chamber is required to comply since the remainder of the facility is designed and constructed according to the IBC. The section has been revised to clearly state that it is the hyperbaric chamber that must comply.

This Public Comment will provide a reference standard and guidance for the installation of hyperbaric chambers into Group I-2 occupancies. This will only apply when a hyperbaric chamber is installed in a Group I-2 occupancy. This proposal will provide guidance for the designer and the code official regarding the installation and design for the hyperbaric chambers.

Final Hearing Results

G82-07/08

AMPC

Code Change No: G83-07/08

Original Proposal

Section: 408.1.1 (New)

Proponent: A. Brooks Ballard, Virginia Department of Corrections

Add new definition as follows:

408.1.1 Definition. The following word and term shall, for the purposes of this chapter and as used elsewhere in this code, have the meaning shown herein.

SALLYPORT. A security vestibule with two or more doors or gates where the intended purpose is to prevent continuous and unobstructed passage by allowing the release of only one door or gate at a time.

Reason: The term sallyport is used in Section 408 IBC but is not defined. This definition clarifies what is meant by the term sallyport. This section applies to Group I-3 and associated occupancies only.

Cost Impact: The code change will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: Sally port is a commonly used term and is appropriate to define for Group I-3 occupancies.

Assembly Action:

None

Final Hearing Results

G83-07/08

AS

Code Change No: **G84-07/08**

Original Proposal

Section: 408.2

Proponent: A. Brooks Ballard, Virginia Department of Corrections

Revise as follows:

408.2 (Supp) ~~Mixed~~ Other occupancies. ~~Buildings or portions of buildings with an occupancy in Group I-3 that are classified in Group I-3 occupancies where security operations necessitate the locking of required means of egress shall be permitted to be classified as a different occupancy. Occupancies classified as other than Group I-3 shall meet the applicable requirements of this code for that such occupancy occupancies. Where security operations necessitate the locking of required means of egress, provided provisions shall be are made for the release of occupants at all times. Where the provisions of this code for occupancies other than Group I-3 are more restrictive than the provisions for Group I-3 occupancies, the Group I-3 occupancy provisions shall be permitted to be used.~~

Means of egress from detention and correctional occupancies that traverse other use areas shall, as a minimum, conform to requirements for detention and correctional occupancies.

Exception: It is permissible to exit through a horizontal exit into other contiguous occupancies that do not conform to detention and correctional occupancy egress provisions but that do comply with requirements set forth in the appropriate occupancy, as long as the occupancy is not a Group H use.

Reason: The purpose of the change is to clarify the existing provision to make it clear that buildings or portions of buildings in detention and correctional facilities where the doors are locked but otherwise the classification would be a different occupancy (Groups A, E, F, S, B, etc.) may be classified as the occupancy they fall under provided the occupants can exit in an emergency. The IBC Commentary and ICC Interpretation No. 2/308/98 already state this is the intent of the provision. New language is added to permit the use of any Group I-3 provisions which are less restrictive than the provisions of the occupancy in which the building is classified, with the caveat that such provisions may be prohibited from being used by other provisions of the code. While there are no specific prohibitions currently in the code, several proposals being submitted in conjunction with this proposal would provide specific prohibitions, such as the proposal to allow security glazing in smoke barriers in Group I-3 occupancies. Language was added to that proposal to limit its application to only occupancies associated with Group I-3 and not permit it to apply to other occupancies in the Code.

The proposal is necessary to permit building and portions of buildings in detention and correctional facilities which do not otherwise fall into the Group I-3 classification to be constructed at the least possible cost while providing the necessary safeguards and security to assure the safety of the occupants.

Cost Impact: The code change will not increase and may decrease the cost of construction.

Public Hearing Results

Committee Action:

Approved as Modified

Modify the proposal as follows:

408.2 (Supp) Other occupancies. Buildings or portions of buildings in Group I-3 occupancies where security operations necessitate the locking of required means of egress shall be permitted to be classified as a different occupancy. Occupancies classified as other than Group I-3 shall meet the applicable requirements of this code for that occupancy provided provisions are made for the release of occupants at all times. ~~Where the provisions of this code for occupancies other than Group I-3 are more restrictive than the provisions for Group I-3 occupancies, the Group I-3 occupancy provisions shall be permitted to be used.~~

Means of egress from detention and correctional occupancies that traverse other use areas shall, as a minimum, conform to requirements for detention and correctional occupancies.

Exception: It is permissible to exit through a horizontal exit into other contiguous occupancies that do not conform to detention and correctional occupancy egress provisions but that do comply with requirements set forth in the appropriate occupancy, as long as the occupancy is not a Group H use.

Committee Reason: The proposal clarifies application of this section which is intended to allow other types of occupancies within buildings containing Group I-3 occupancies.

Assembly Action:

None

Final Hearing Results

G84-07/08

AM

Code Change No: **G85-07/08**

Original Proposal

Section: 408.3.7 (New)

Proponent: A. Brooks Ballard, Virginia Department of Corrections

Add new text as follows:

408.3.7 Guard tower doors. A hatch or trap door not less than 16 square feet (610 m²) in area through the floor and having minimum dimensions of not less than 2 feet (610 mm) in any direction shall be permitted to be used to access guard towers.

Reason: This provision is necessary to allow the use of trap doors in the floor of an observation point with limited size access and occupancy as a means of ingress and egress. In order to provide the 360-degree visibility and maximum mobility necessary for guard observation stations, the size of the base of such elevated stations must be kept to a minimum. Security is increased without risk to either the general public or the inmates, since access to these spaces is restricted to prison staff personnel.

Cost Impact: The code change will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The trap door is a reasonable allowance for Group I-3 occupancies. The dimensions provided are reasonable and provide the necessary access for guards to perform their duties in guard towers.

Assembly Action:

None

Final Hearing Results

G85-07/08

AS

Code Change No: **G86-07/08**

Original Proposal

Section: 408.5

Proponent: Don Lee, DLR Group, representing himself

Delete and substitute as follows:

~~**408.5 Vertical openings.** Vertical openings shall be enclosed in accordance with Section 707.~~

~~**Exception:** A floor opening between floor levels of residential housing areas is permitted without enclosure protection between the levels, provided that both of the following conditions are met:~~

- ~~1. The entire normally occupied areas so interconnected are open and unobstructed so as to enable observation of the areas by supervisory personnel.~~
- ~~2. Means of egress capacity is sufficient to provide simultaneous egress for all occupants from all interconnected levels and areas.~~

The height difference between the highest and lowest finished floor levels shall not exceed 23 feet (7010 mm). Each story, considered separately, has at least one-half of its individual required means of egress capacity provided by exits leading directly out of that story without traversing another story within the interconnected area.

408.5 Protection of vertical openings. Vertical openings shall be protected in accordance with Section 408.5.1 through 408.5.3.

408.5.1 Vertical opening enclosure. Any vertical openings shall be enclosed in accordance with Section 707 except as provided by 408.5.2 or 408.5.3.

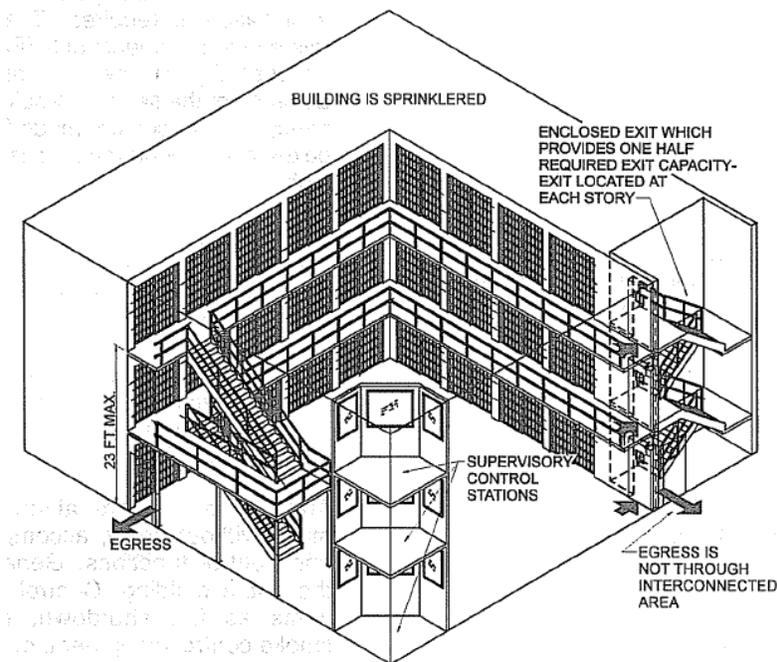
408.5.2 Atriums. Atriums complying with 404 shall be permitted.

408.5.3 Floor openings. A floor opening between floor levels of residential housing areas is permitted without enclosure protection between the levels, provided the following conditions are met:

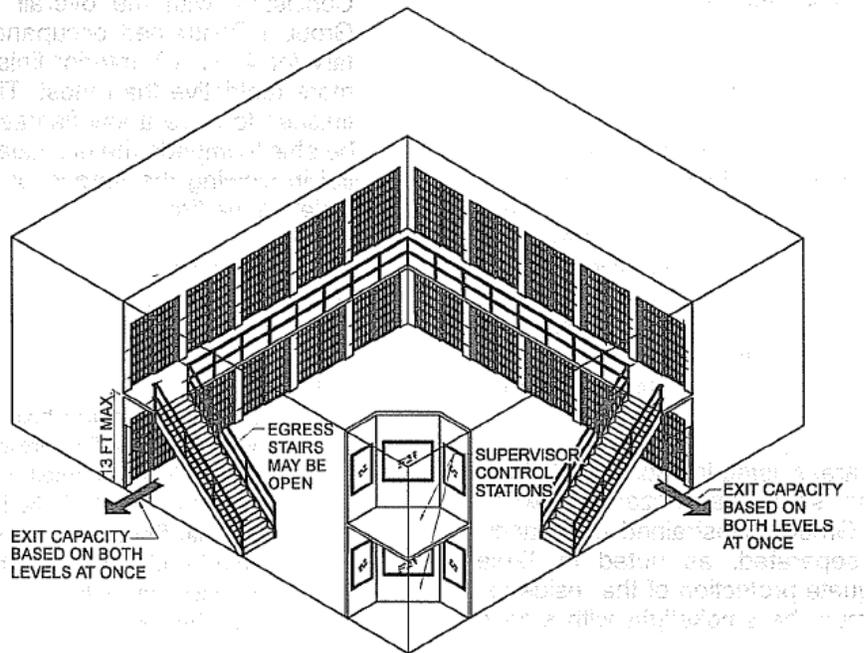
1. The entire normally occupied areas so interconnected are open and unobstructed so as to enable observation of the areas by supervisory personnel.
2. Means of egress capacity is sufficient to provide simultaneous egress for all occupants from all interconnected levels and areas.
3. The height difference between the highest and lowest finished floor levels shall not exceed 23 feet (7010 mm). Each floor level, considered separately, shall have at least one-half of the required means of egress capacity provided by exits leading directly out of that floor level without traversing another floor level within the interconnected area.

Exception: When the height difference between the highest and lowest finished floor levels does not exceed 13 feet (7010 mm) egress may traverse another floor level in the interconnected area.

Reason: This change is intended to clarify the exiting from floor levels within the residential housing units. Without this change the “floor levels” get treated as stories and additional exits are required. Currently a residential housing unit with two floor levels and a very small occupant load can be required to have three exits which in a detention facility is problematic. This change would then allow the two level units to have just two exits with no direct egress from the upper floor level as long as common path and travel distances are met. The figures below illustrate the proposal and should be included in the commentary.



**FIGURE 1 – 408.5.3 Item 3
MULTILEVEL RESIDENTIAL HOUSING WITHOUT
VERTICAL OPENING ENCLOSURE**



**FIGURE 2 – 408.5.3 Item 3
EXCEPTION TO 408.5.3.3**

Bibliography:

2006 NFPA 101, Life Safety Code, 22.2.5.1, 22.3.1, National Fire Protection Association
 1999 *Standard Building Code*, 409.2.7, International Code Council
 1999 *Standard Building Code Commentary*, 409.2.7, International Code Council, Figures for the code change
 1997 *Uniform Building Code*, Appendix Chapter 3, Division 1 – Detention & Correctional Facilities, ICBO

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: Atriums are already allowed elsewhere in the code and such an allowance does not need to be restated. Generally the proposed language is unclear and needs to be revised to clarify intent -specifically, the term traverse is incorrectly used with regard to egress.

Assembly Action:

None

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Don Lee, DLR Group, representing himself, requests Approval as Modified by this public comment.

Replace proposal as follows:

408.5 Vertical openings. Vertical openings shall be enclosed in accordance with Section 707.

Exception: A floor opening between floor levels of residential housing areas is permitted without enclosure protection between the levels, provided that both of the following conditions are met:

1. The entire normally occupied areas so interconnected are open and unobstructed so as to enable observation of the areas by supervisory personnel.
2. Means of egress capacity is sufficient to provide simultaneous egress for all occupants from all interconnected levels and areas.

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The height difference between the highest and lowest finished floor levels shall not exceed 23 feet (7010 mm). Each story, considered separately, has at least one-half of its individual required means of egress capacity provided by exits leading directly out of that story without traversing another story within the interconnected area.

408.1.1 Definition. The following word and term shall, for the purposes of this chapter and as used elsewhere in this code, have the meaning shown herein.

CELL. A room within a housing unit in a detention or correctional facility used for confinement of inmates or prisoners.

CELL TIER	<u>Levels of cells vertically stacked above one another within a housing unit.</u>
HOUSING UNIT	<u>A dormitory or a group of cells with a common dayroom in Group I-3.</u>

408.5 Protection of Vertical openings. Any vertical openings shall be enclosed in accordance with Section 707 or shall be in accordance with Section 408.5.1.

408.5.1 Floor Openings. Openings in floors within a housing unit are permitted without enclosure protection, provided all the following conditions are met:

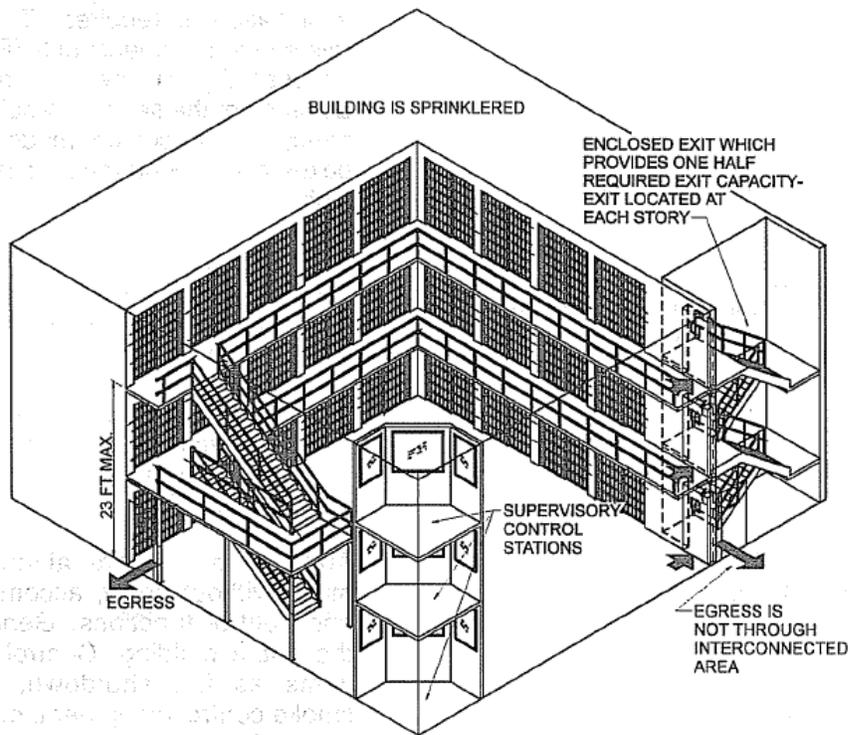
1. The entire normally occupied areas so interconnected are open and unobstructed so as to enable observation of the areas by supervisory personnel.
2. Means of egress capacity is sufficient for all occupants from all interconnected cell tiers and areas.
3. The height difference between the floor levels of the highest and lowest cell tiers shall not exceed 23 feet (7010 mm).
4. Egress from any portion of a cell tier to an exit or exit access door shall not require travel on more than one additional floor level within the housing unit.

Commenter's Reason: This change is intended to correct and clarify the code as to the intent of multi-level housing units in I-3 occupancies. These levels are not mezzanines nor are they necessarily separate stories. At the Public Hearing a reason given for denial the committee said egress cannot traverse. At the same time the current code uses the wording. The current code language is confusing in that it starts talking about "floor levels" and then in the last paragraph talks about "stories." The addition of the definitions is aimed at bringing clarity to the section and carrying forth a concept used in legacy codes. The cell tiers are to be treated similar to mezzanines for area calculations but the mezzanine provisions of the code are too restrictive to allow use in this application.

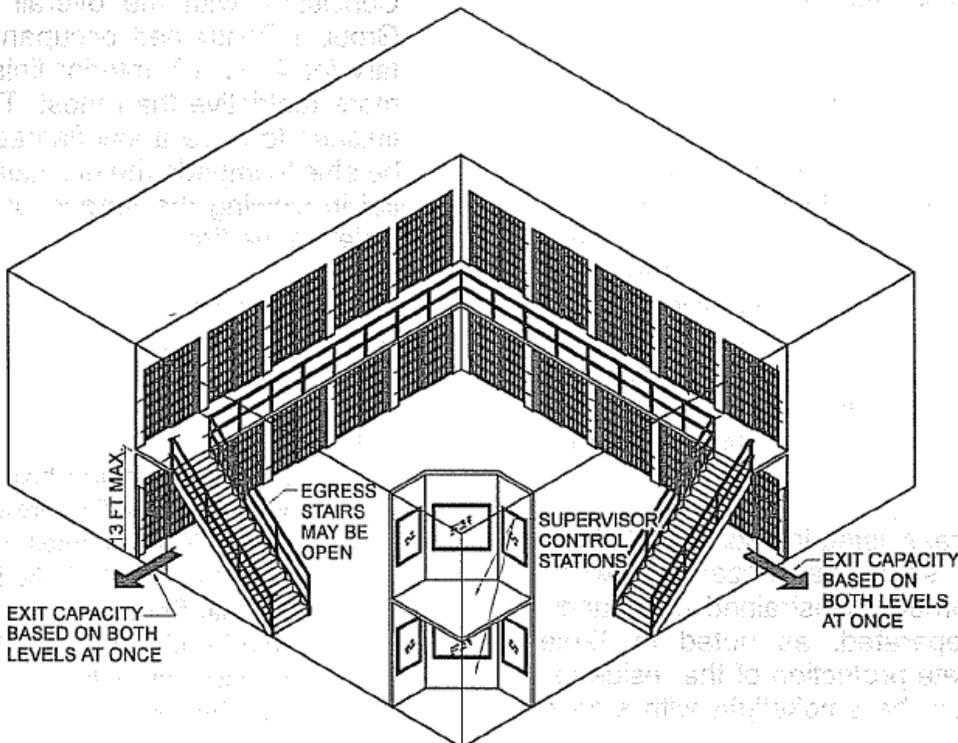
The attached Figures 1 & 2 should be included in the Commentary.

Bibliography;

2006 NFPA 101, Life Safety Code, 22.2.5.1, 22.3.1, National Fire Protection Association
1999 Standard Building Code, 409.2.7, International Code Council
1999 Standard Building Code Commentary, 409.2.7, International Code Council, Figures for the code change
1997 Uniform Building Code, Appendix Chapter 3, Division 1 – Detention & Correctional Facilities, ICBO



**FIGURE 408.5.3(1)
MULTILEVEL RESIDENTIAL HOUSING WITHOUT
VERTICAL OPENING ENCLOSURE**



**FIGURE 408.5.3(2)
EXCEPTION TO 408.5.3.3**

Final Hearing Results

G86-07/08

AMPC

Code Change No: **G87-07/08**

Original Proposal

Section: 408.5.21 (New)

Proponent: A. Brooks Ballard, Virginia Department of Corrections

Add new text as follows:

408.5.1 Noncombustible shaft openings in communicating floor levels. Where vertical openings are permitted without enclosure protection in accordance with Section 408.5, noncombustible shafts serving floor levels within the story such as plumbing chases for individual cells at different levels within the story shall also be permitted without enclosure protection. Where additional stories are located above or below, the shaft shall be permitted to continue with fire and smoke damper protection provided at the fire resistance rated floor/ceiling assembly between the non-communicating stories.

Reason: Section 408.5 permits floor openings between floor levels of residential housing areas without enclosure protection between the levels provided the areas are open and egress capacity is sufficient. In such areas, it makes no sense to require a plumbing or mechanical chase to have to meet the shaft requirements as the floor areas are already open to each other. This proposal simply adds a subsection which recognizes that there is no need for such shafts to be protected at those levels. Should the chase continue to other floors which are not open to each other, this new subsection would require protection at the rated floor/ceiling assembly separating the non-communicating floors.

Cost Impact: The code change will not increase the cost of construction.

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: There are numerous flaws with the terminology. For example, the term floor level is used very differently throughout the IBC than as applied in this proposal. In addition, the proponent discussed maximum opening size and story limitations which are not specifically addressed in this proposal.

Assembly Action:

None

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

A. Brooks Ballard, Virginia Department of Corrections, requests Approval as Modified by this public comment.

Modify proposal as follows:

~~408.5.1 Noncombustible Shaft openings in communicating floor levels.~~ ~~Where vertical a floor openings are is permitted between communicating floor levels of residential housing, without enclosure protection in accordance with the exception to Section 408.5- noncombustible shafts serving floor levels within the story such as plumbing chases for serving vertically stacked individual cells at different levels contained within the story area shall also be permitted without enclosure protection. Where additional stories are located above or below, the shaft shall be permitted to continue with fire and smoke damper protection provided at the fire resistance rated floor/ceiling assembly between the non-communicating stories.~~

Commenter-s Reason: To remove flaws in terminology and to clarify the intent of the original submitted change.

Final Hearing Results

G87-07/08

AMPC

Code Change No: **G88-07/08**

Original Proposal

Section: 408.6.4 (New)

Proponent: A. Brooks Ballard, Virginia Department of Corrections

Add new text as follows:

408.6.4 Fire barriers. Windows and doors in fire barriers with a fire resistance rating of 1 hour constructed in accordance with Section 706 shall be permitted to have security glazing installed provide that the following conditions are met.

1. The total area of glazing at each floor level shall not exceed 5,000 square inches (3 m²) and individual panels of glazing shall not exceed 1,296 square inches (0.84 m²).
2. The glazing shall be protected on both sides by an automatic fire sprinkler system. The sprinkler system shall be designed to wet completely the entire surface of any glazing affected by fire when actuated.
3. The glazing shall be in a gasketed frame and installed in such a manner that the framing system will deflect without breaking (loading) the glass before the sprinkler system operates.
4. Obstructions, such as curtain rods, drapery traverse rods, curtains, drapes or similar materials shall not be installed between the automatic sprinklers and the glazing.

Reason: This change extends the methodology already permitted for glazing in exit enclosures to security glazing in fire barriers in Group I-3 occupancies. The glazing would not have to meet the requirements of Section 715, Opening protectives, but would have equivalent protection through the limitations of condition numbers 1-4 which require protection through the use of an automatic sprinkler (deluge) system and which limit the size of the glazing and provide other conditions. The change is necessary to track and contain inmate movement for the protection of other inmates and administrative personnel. This change would be applicable to other occupancies in detention and correctional occupancies accordance with Section 408.2.

Cost Impact: The code change will not increase the cost of construction.

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The provisions were felt to be located within the smoke barrier requirements which was confusing. The testing demonstrating the performance of such provisions was not provided.

Assembly Action:

None

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

A. Brooks Ballard, Virginia Department of Corrections, requests Approval as Modified by this public comment.

Modify proposal as follows:

408.6 Smoke barrier. Occupancies in Group I-3 shall have smoke barriers complying with Section 408.7 and Section 709 to divide every story occupied by residents for sleeping, or any other story having an occupant load of 50 or more persons, into at least two smoke compartments.

Exception: Spaces having a direct exit to one of the following, provided that the locking arrangement of the doors involved complies with the requirements for doors at the smoke barrier for the use condition involved:

1. A public way.
2. A building separated from the resident housing area by a 2-hour fire-resistance-rated assembly or 50 feet (15 240 mm) of open space.
3. A secured yard or court having a holding space 50 feet (15 240 mm) from the housing area that provides 6 square feet (0.56 m²) or more of refuge area per occupant, including residents, staff and visitors.

408.6.4 Fire barriers 408.7 Security glazing. In occupancies in Group I-3, windows and doors in 1 hour fire barriers ~~with a fire resistance rating of 1 hour~~ constructed in accordance with Section 706, fire partitions constructed in accordance with Section 708 and smoke barriers constructed in accordance with Section 709 shall be permitted to have security glazing installed provided that the following conditions are met.

1. ~~The total area of glazing at each floor level shall not exceed 5,000 square inches (3 m²) and~~ Individual panels of glazing shall not exceed 1,296 square inches (0.84 m²).
2. The glazing shall be protected on both sides by an automatic fire sprinkler system. The sprinkler system shall be designed to, when actuated, wet completely the entire surface of any glazing affected by fire ~~when actuated~~.
3. The glazing shall be in a gasketed frame and installed in such a manner that the framing system will deflect without breaking (loading) the glass before the sprinkler system operates.
4. Obstructions, such as curtain rods, drapery traverse rods, curtains, drapes or similar materials shall not be installed between the automatic sprinklers and the glazing.

(Renumber subsequent sections)

Commenter's Reason: The intent of the changes remains to permit openings in walls in of I-3 occupancies, similar to those allowed in the stairway enclosures. The modification will address the three most common types of walls, fire barriers, fire partitions and smoke barriers, which can occur within this type of facility. It is not the intent to permit this in fire walls or any wall requiring a 2-hour or higher rating. Although this could be located in Chapter 7, it is for use within Use I-3 only and may be less confusing and more applicable in the special requirements section for I-3. As an additional note, in the original reason the term 'deluge' was included by mistake and should be deleted for purposes of explanation in the commentary.

-Technical requirements were taken from 1991 test results performed on polycarbonate (Lexan) security glazing by Southwest Research Institute, National Research Council of Canada at Inchcape Testing Services (Warnock Hersey). These tests show one and two hour performance per ASTM E-119 fuel load. Similar results are shown in ICC ES Legacy Report NER-516 in the testing of regular glass with sprinkler protection.

- There is currently no security glazing available (except those that are wire glass laminates) which have fire ratings. A product that is promoted as vandal resistant is not security glazing. To call a product 'security glazing' it needs to meet requirements from ASTM F1915 or from HP White or WMFL forced entry tests.

Bibliography:

ICC ES Legacy Report NER-516, ICC Evaluation Service, Inc.
"Fire Test of a LEXAN Polycarbonate Glazing Assembly Protected by a Sprinkler",
Report No. CR- 6485.1, dated 14 June 1991, National Fire Laboratory, National Research Council of Canada

Final Hearing Results

G88-07/08

AMPC

Code Change No: G89-07/08

Original Proposal

Section: 408.8

Proponent: A. Brooks Ballard, Virginia Department of Corrections

Revise as follows:

408.8 Windowless buildings. For the purposes of this section, a windowless building or portion of a building is one with nonopenable windows, windows not readily breakable or without windows. Windowless buildings shall be provided with an engineered smoke control system to provide ~~ventilation (mechanical or natural)~~ a tenable environment for exiting from the smoke compartment in the area of fire origin in accordance with Section 909 for each windowless smoke compartment.

Reason: Because of the security requirements in jails and prisons, safety for both inmates and the public requires a “defend in place” philosophy. This change is necessary for the safety of the public, of the facility employees and the inmates themselves. In an incident, doors and locks must be opened by administrative action for the inmates to be moved. Employees may have to go into the area of origin to rescue inmates, to break up fights or to release door locks. Of the three engineered smoke control systems indicated in Section 909, only Section 909.8, Exhaust Method, requires a tenable environment in the area of origin. A tenable environment is necessary for the safety and liability issues inmate to I-3 occupancies.

Cost Impact: The code change will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The proposal clarifies the intent of the windowless building provisions for smoke control. A pressurization system would not provide a tenable environment in the area of fire origin. This clarification will specifically require that a tenable environment be provided.

Assembly Action:

None

Final Hearing Results

G89-07/08

AS

Code Change No: G92-07/08

Original Proposal

Sections: 411.7, 411.7.1 (New)

Proponent: Bob Eugene, Underwriters Laboratories Inc.

THIS PROPOSAL IS ON THE AGENDA OF THE IBC MEANS OF EGRESS CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THIS COMMITTEE

Revise as follows:

411.7 (Supp) Exit marking. Exit signs shall be installed at the required exit or exit access doorways of amusement buildings in accordance with this section and in accordance with Section 1011. Approved directional exit markings shall also be provided. Where mirrors, mazes or other designs are utilized that disguise the path of egress travel such that they are not apparent, approved and listed low-level exit signs that comply with Section 1011.4, and directional path markings listed in accordance with UL 1994, shall be provided and located not more than 8 inches (203 mm) above the walking surface and on or near the path of egress travel. Such markings shall become visible in an emergency. The directional exit marking shall be activated by the automatic fire detection system and the automatic sprinkler system in accordance with Section 907.2.11.2.

411.7.1 Externally illuminated exit signs. Where demonstrated to be reliable and sufficient and where approved, externally illuminated exit signs shall be permitted to be installed.

Reason: The proposed change includes the requirement that it meet the exit sign requirements of section 1011. By including this reference the exit sign will clearly provide the use of the different types, duration and listing for the exits signs. As new technology for the illumination of the exit signs changes, so should be code sections that regulate them. The language in the IBC section 1011.4 includes the new self-luminous and photoluminescent exit sign types. The new Section 411.7.1 provides direction for this new type of exit sign. In some situations, not all types of signs can be used and adding this new section highlights the need to assess the normal lighting levels in the area it is to be installed. This is so that in areas with normal low lighting, a sign that depends on normal light levels might not be appropriate for some type of signs, such as the photoluminescent type signs.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

This code change was heard by the IBC MOE Code Development Committee.

Committee Action:

Approved as Modified

Modify the proposal as follows:

411.7 (Supp) Exit marking. Exit signs shall be installed at the required exit or exit access doorways of amusement buildings in accordance with this section and in accordance with Section 1011. Approved directional exit markings shall also be provided. Where mirrors, mazes or other designs are utilized that disguise the path of egress travel such that they are not apparent, approved and listed low-level exit signs that comply with Section 1011.4, and directional path markings listed in accordance with UL 1994, shall be provided and located not more than 8 inches (203 mm) above the walking surface and on or near the path of egress travel. Such markings shall become visible in an emergency. The directional exit marking shall be activated by the automatic fire detection system and the automatic sprinkler system in accordance with Section 907.2.11.2.

~~**411.7.1 Externally illuminated exit signs.** Where demonstrated to be reliable and sufficient and where approved, externally illuminated exit signs shall be permitted to be installed.~~

Committee Reason: Section 411.7.1 was deleted because the term 'demonstrated to be reliable and sufficient' is vague and unenforceable. In addition, the proposal does not indicate who would be responsible to demonstrate this to the code official. The proposed language in Section 411.7, by its reference to Section 1011, would address exterior exit signage adequately.

Assembly Action:

None

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Bob Eugene, Underwriters Laboratories Inc., requests Approval as Modified by this public comment.

Further modify proposal as follows:

411.7 (Supp) Exit marking. Exit signs shall be installed at the required exit or exit access doorways of amusement buildings in accordance with this section and in accordance with Section 1011. Approved directional exit markings shall also be provided. Where mirrors, mazes or other designs are utilized that disguise the path of egress travel such that they are not apparent, approved and listed low-level exit signs that comply with Section 1011.4, and directional path markings listed in accordance with UL 1994, shall be provided and located not more than 8 inches (203 mm) above the walking surface and on or near the path of egress travel. Such markings shall become visible in an emergency. The directional exit marking shall be activated by the automatic fire detection system and the automatic sprinkler system in accordance with Section 907.2.11.2.

411.7.1 Photoluminescent exit signs. Where photoluminescent exit signs are installed, activating light source and viewing distance shall be in accordance with the listing and markings of the signs.

Commenter's Reason: The new Section 411.7.1 provides direction for photoluminescent of exit sign. Photoluminescent exit signs are excited by specific sources of light as indicated in the listing and labeling. In some situations, not all types of signs can be used and adding this new section highlights the need to assess the normal lighting levels in the area where such signs are to be installed.

Final Hearing Results

G92-07/08

AMPC

Code Change No: **G93-07/08**

Original Proposal

Section: 412.2.4

Proponent: Randall R. Dahmen, WI Registered PE, representing the WI Licensed Commercial Building Inspector

Revise as follows:

412.2.4 Heating equipment. Heating equipment shall be placed in another room separated by 2-hour fire-resistance-rated fire barriers constructed in accordance with Section 706 or horizontal assemblies constructed in accordance with Section 711, or both construction. Entrance shall be from the outside or by means of a vestibule providing a two-doorway separation.

Exceptions:

1. Unit heaters and vented infrared radiant heating equipment suspended at least 10 feet (3048 mm) above the upper surface of wings or engine enclosures of the highest aircraft that are permitted to be housed in the hangar and at least 8 feet (2438 mm) above the floor in shops, offices and other sections of the hangar communicating with storage or service areas.
2. A single interior door shall be allowed, provided the sources of ignition in the appliances are at least 18 inches (457 mm) above the floor.

Reason: As stated in the 2006 commentary "As part of the special use and occupancy requirements for commercial aircraft hangars, all possible ignition sources must be controlled and isolated. Specifically, all heating equipment must be located in rooms that are separated from the main areas where the aircraft are parked. This separation must be a 2-hour fire-resistance-rated construction. Although not explicitly stated in the current wording, all openings through the fire rated walls must be protected..."

Because the type of fire rated assembly is not currently defined, the means by which to protect a penetration to the assembly is in question. By defining the fire rated assemblies as either a fire barrier or a horizontal fire assembly, this directs the code user to IBC sections 711, 712, 716.5.2 & 715.6 for the proper means on how to address penetrations.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Modified

Modify the proposal as follows:

412.2.4 Heating equipment. Heating equipment shall be placed in another room separated by 2-hour ~~fire-resistance-rated~~ fire barriers constructed in accordance with Section 706 or horizontal assemblies constructed in accordance with Section 711, or both. Entrance shall be from the outside or by means of a vestibule providing a two-doorway separation.

Exceptions:

1. Unit heaters and vented infrared radiant heating equipment suspended at least 10 feet (3048 mm) above the upper surface of wings or engine enclosures of the highest aircraft that are permitted to be housed in the hangar and at least 8 feet (2438 mm) above the floor in shops, offices and other sections of the hangar communicating with storage or service areas.
2. A single interior door shall be allowed, provided the sources of ignition in the appliances are at least 18 inches (457 mm) above the floor.

Committee Reason: The proposal is consistent with code terminology and revisions in the 2007 Supplement. The modification removes and unnecessary term as fire barriers and horizontal assemblies are already fire-resistive.

Assembly Action:

None

Final Hearing Results

G93-07/08

AM

Code Change No: G94-07/08

Original Proposal

Section: 412.5.4

Proponent: Robert Bagnetto, Lapeyre Stair, Inc.

Revise as follows:

412.5.4 Means of egress. The means of egress from heliports and helistops shall comply with the provisions of Chapter 10. Landing areas located on buildings or structures shall have two or more means of egress. For landing areas less than 60 ft (18,288mm) in length or less than 2,000 square feet (186 m²) in area, the second means of egress may be a fire escape, alternating tread device or ladder leading to the floor below.

Reason: The purpose of this proposed change is to allow the use of alternating tread devices as a second means of egress from Heliports and Helistops with landing areas less than 60 ft in length or less than 2,000 square feet in area.

The proposed change is superior to the current provisions of the code in that it provides the option of using an additional type of access component to heliports and helistops that is suitable for such application and that is not currently allowed by the code. IBC-2006 section 412.5.4 is overly restrictive in that it does not allow the use of alternating tread devices as a second means of egress from heliports or helistops, but does allow ladders for such use. Alternating tread devices have been shown by the scientific study "Performance, perceived safety and comfort of the alternating tread stair" to be an acceptable vertical access component. Alternating tread devices, by virtue of their features (i.e. 50 to 70° angle, larger tread size and side rails), are typically safer to use than vertical ladders and would be suitable for the application specified in section 412.5.4. IBC-2006 allows the use of alternating tread devices in sections, including but not limited to, 1009.11, 1015.3, 1015.4, 1015.6.1. Additionally, proposal E134-06/07, which was approved at the Code Development Hearings in September 2006, added the use of alternating tread devices to Helistops to section 1019.1.2.

Bibliography

IBC code change proposal E134-06/07

Performance, perceived safety and comfort of the alternating tread stair, Virginia Polytechnic and State University, Jorna, Mohageg and Snyder, March 1989

Cost Impact: The code change proposal could result in a minor increase in construction costs if alternating tread devices are used in lieu of ladders as the second means of egress to Heliports or Helistops.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: It is reasonable to add alternating tread devices as ladders are already permitted.

Assembly Action:

None

Final Hearing Results

G94-07/08

AS

Code Change No: G98-07/08

Original Proposal

Sections: [F] 415.6, [F] 415.7.1 (New)

Proponent: Jeffrey M. Shapiro, PE, International Code Consultants, representing himself

THIS PROPOSAL IS ON THE AGENDA OF THE IFC CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IFC CODE DEVELOPMENT COMMITTEE.

1. Revise as follows:

[F] 415.6.2 Flammable and combustible liquids. The storage, handling, processing and transporting of flammable and combustible liquids in Group H-2 and H-3 occupancies shall be in accordance with 415.6.2.1 through 415.6.2.10, the *International Mechanical Code* and the *International Fire Code*.

2. Add new text as follows:

[F] 415.7.1 Flammable and combustible liquids. The storage, handling, processing and transporting of flammable and combustible liquids in Group H-3 occupancies shall be in accordance with 415.6.2.

(Renumber subsequent sections)

Reason: Flammable and combustible liquids can cause an occupancy to be classified as H-2 or H-3, and the fact that these materials are currently addressed under 415.6.2 for H-2 is confusing. The proposed revisions fix this by adding appropriate references for H-3.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

This proposal was heard by the IFC Code Development Committee.

Committee Action:

Approved as Submitted

Committee Reason: The committee agreed that the proponent's reason statement accurately and adequately substantiates the need for the change. The proposal clarifies that flammable and combustible liquids can result in either a Group H-2 or a Group H-3 occupancy classification whereas the current text implies only Group H-2.

Assembly Action:

None

Final Hearing Results

G98-07/08

AS

Code Change No: **G100-07/08**

Original Proposal

Section: [F] 415.6.3, Chapter 35 (New)

Proponent: Larry Fluor, Larry Fluor, Inc., representing the Compressed Gas Association

THIS PROPOSAL IS ON THE AGENDA OF THE IFC DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IFC CODE DEVELOPMENT COMMITTEE.

Revise as follows:

[F] 415.6.3 Liquefied petroleum gas-distribution facilities. ~~The construction and installation of liquefied petroleum gas facilities shall be in accordance with the requirements of this code, the *International Fire Code*, the *International Mechanical Code*, the *International Fuel Gas Code* and NFPA 58.~~

~~The design and construction of propane, butane, propylene, butylene and other liquefied petroleum gas-distribution facilities shall conform to the applicable provisions of Sections 415.6.3.1 through 415.6.3.5.2. The storage and handling of liquefied petroleum gas systems shall conform to the *International Fire Code*. The design and installation of piping, equipment and systems that utilize liquefied petroleum gas shall be in accordance with the *International Fuel Gas Code*. Liquefied petroleum gas-distribution facilities shall be ventilated in accordance with the *International Mechanical Code* and Section 415.6.3.1.~~

~~**[F] 415.6.3.1 Air movement.** Liquefied petroleum gas-distribution facilities shall be provided with air inlets and outlets arranged so that air movement across the floor of the facility will be uniform. The total area of both inlet and outlet openings shall be at least 1 square inch (645 mm²) for each 1 square foot (0.093 m²) of floor area. The bottom of such openings shall not be more than 6 inches (152 mm) above the floor.~~

~~**[F] 415.6.3.2 (Supp) Construction.** Liquefied petroleum gas-distribution facilities shall be constructed in accordance with Section 415.6.3.3 for separate buildings, Section 415.6.3.4 for attached structures or Section 415.6.3.5 for rooms within buildings.~~

~~**[F] 415.6.3.3 Separate buildings.** Where located in separate buildings, liquefied petroleum gas-distribution facilities shall be occupied exclusively for that purpose or for other purposes having similar hazards. Such buildings shall be limited to one story in height and shall conform to Sections 415.6.3.3.1 through 415.6.3.3.3.~~

~~**[F] 415.6.3.3.1 Floors.** The floor shall not be located below ground level and any spaces beneath the floor shall be solidly filled or shall be unenclosed.~~

~~**[F] 415.6.3.3.2 Materials.** Walls, floors, ceilings, columns and roofs shall be constructed of noncombustible materials.~~

~~**[F] 415.6.3.3.3 Explosion venting.** Explosion venting shall be provided in accordance with the *International Fire Code*.~~

~~**[F] 415.6.3.4 (Supp) Attached structures.** Where liquefied petroleum gas-distribution facilities are located in an attached structure, the attached perimeter shall not exceed 50 percent of the perimeter of the space enclosed and the facility shall comply with Sections 415.6.3.3 and 415.6.3.4.1. Where the attached perimeter exceeds 50 percent, such facilities shall comply with Section 415.6.3.5.~~

~~**[F] 415.6.3.4.1 (Supp) Fire separation.** Attached structures shall be separated from the building by fire barriers constructed in accordance with Section 706 or horizontal assemblies constructed in accordance with Section 711, or both. The minimum fire-resistance rating shall be 1 hour and the fire barriers shall not have openings. Such fire barriers and horizontal assemblies shall be designed to withstand a static pressure of at least 100 pounds per square foot (4788 Pa), except where the building to which the structure is attached is occupied by operations or processes having a similar hazard.~~

Exception: Fire barriers between attached structures occupied only for the storage of LP-gas are permitted to have fire door assemblies that comply with Section 706.7.

~~**[F] 415.6.3.5 Rooms within buildings.** Where liquefied petroleum gas-distribution facilities are located in rooms within buildings, such rooms shall be located in the first story above grade plane and shall have at least one exterior wall with sufficient exposed area to provide explosion venting as required in the *International Fire Code*. The building in which the room is located shall not have a basement or unventilated crawl space and the room shall comply with Sections 415.6.3.5.1 and 415.6.3.5.2.~~

~~**[F] 415.6.3.5.1 Materials.** Walls, floors, ceilings and roofs of such rooms shall be constructed of approved noncombustible materials.~~

~~**[F] 415.6.3.5.2 (Supp) Fire separation.** The rooms shall be separated from the building by fire barriers constructed in accordance with Section 706 or horizontal assemblies constructed in accordance with Section 711, or both. The minimum fire-resistance rating shall be 1 hour and the fire barriers shall not have openings. Such fire barriers and horizontal assemblies shall be designed to withstand a static pressure of at least 100 pounds per square foot (4788 Pa), except where the building, within which the room is located, is occupied by operations or processes having a similar hazard.~~

~~**Exception:** Fire barriers between common walls occupied only for the storage of LP-gas are permitted to have opening protectives complying with Section 715.~~

2. Add standard to Chapter 35 as follows:

NFPA

58-04 Liquefied Petroleum Gas Code

Reason: The provisions of 415.6.3 are a carry over from one of the Legacy codes. The requirements are applicable to "Liquefied petroleum gas (LP-Gas)-distribution facilities" which as a term is undefined in the IBC and not used in the IFC. NFPA 58 provides a comprehensive set of construction requirements for LP Gas-distribution facilities as well as bulk plants, and industrial plant in which LP gas systems, storage systems, vaporizers, mixing systems and similar activities are involved. The terminology used in the existing IBC provisions include terms that are undefined within the ICC system including "separate building and attached building." The ICC approach uses "detached buildings" and buildings of mixed use or occupancy.

IFGC Section 406.2.1 refers the user to Chapter 10 of NFPA 58 (Buildings or Structures Housing LP Gas-Distribution Facilities) for construction requirements in areas used exclusively to house industrial processes, research and experimental laboratories, or equipment or processing having similar hazards under certain use specific conditions. The reference in the IFGC is intended to get the user to a set of comprehensive provisions which are only found in NFPA 58. IMC Section 502.9.10 requires LP Gas-distribution facilities to be ventilated in accordance with NFPA 58, and no reference is made to IBC Section 415.6.3.

There are no requirements in the IBC that address the construction of *bulk plants* or *industrial plants* and those provisions are only found in NFPA 58. The term *industrial plant* is unique to the NFPA regulatory approach, and it does not correlate with the terminology used within the ICC system. Requirements for cylinder storage areas are not found within the context of "gas-distribution facilities" as they are regulated by other aspects of the LP-Gas Code. The lack of definition has proven to be problematical for some users that handle small quantities of LP-Gas where the primary business is related to the storage and filling of other industrial gases that are located in an IBC compliant H-2 facility, and applicability and adequacy of Section 415.6.3 is called into question.

Chapter 38 of the IFC in Section 3801.1 requires compliance with NFPA 58. Chapter 27 of the IFC in Section requires that building construction comply with the IBC. Deferring construction elements to NFPA 58 will allow the user to determine the requirements for all facilities where LP Gas is stored or used, not just LP Gas-distribution facilities. The application of NFPA 58 is complex, and having an extract of a limited portion of this comprehensive standard (LP Gas Code) in the IBC does not serve to solve problems in application. Should potential conflict arise between application of NFPA 58 and the IBC provisions of the IBC will govern as stated in Section 102.4. This same approach has been used in Section 415.6.4 relative to the construction of dry cleaning plants which must meet the requirements of the IBC as well as those of NFPA 32.

When used in conjunction with the existing requirements of the IFC, IFGC and IMC referring the user to NFPA 58 for construction will improve the overall regulatory approach to control while coordinating with a recognized national standard which is currently referenced by the IFC, IFGC and IMC.

Cost Impact: The code change proposal will not increase the cost of construction

Public Hearing Results

This code change was heard by the IFC Code Development Committee.

Note: The following analysis was not in the Code Change Proposal book but was posted on the ICC website.

Analysis: Review of proposed new standard NFPA 58-04 indicated that, in the opinion of ICC Staff, the standard **did** comply with ICC standards criteria. The standard is already referenced in the IFC and IFGC.

Committee Action:

Approved as Submitted

Committee Reason: The proponent's reason statement accurately and adequately substantiates the need for the change to delete confusing text that is not correlated with the IFC and IFGC and is redundant with the referenced standard.

Assembly Action:

None

Final Hearing Results

G100-07/08

AS

Code Change No: G103-07/08

Original Proposal

Section: 419.2

Proponent: Tim Pate, City & County of Broomfield Building Department, CO, representing the Colorado Chapter of ICC

Revise as follows:

419.2 (Supp) Occupancies. Live/work units shall be classified as a Group R-2 occupancy. Separation requirements found in Section 508.3 shall not apply when the live/work unit is in compliance with Section 419. High-hazard and storage occupancies shall not be permitted in a live/work unit. The aggregate of storage in the non-residential portion of ~~in~~ the live/work unit shall be limited to 10 percent of the space dedicated to nonresidential activities.

Reason: This new wording is required to clarify that the 10% limit of storage square footage should only be based on the square footage of the non-residential area and not the entire area of the live/work area. The present wording would mean you would have to include all of the closet areas in the residential portion. This would include kitchen pantry and all closets in halls and bedrooms. This was brought up as a problem when this code change was brought through in Orlando. The proponent Dave Collins admitted that it was a problem and not his intent but he failed to fix it when it went through the Final Action Hearings in Rochester. This new wording will fix this problem.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The proposal clarifies the storage limitation allowed in a live/work unit is for the non-residential portion of the unit.

Assembly Action:

None

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Maureen Traxler, City of Seattle Department of Planning and Development, requests Approval as Modified by this public comment.

Modify proposal as follows:

419.2 (Supp) Occupancies. Live/work units shall be classified as a Group R-2 occupancy. Separation requirements found in Section 508.3 shall not apply when the live/work unit is in compliance with Section 419. High-hazard and storage occupancies shall not be permitted in a live/work unit. The aggregate area of storage in the non-residential portion of the live/work unit shall be limited to 10 percent of the space dedicated to nonresidential activities.

Commenter-s Reason: This comment adds a word that appears to have been inadvertently omitted from the sentence.

Final Hearing Results

G103-07/08

AMPC

Code Change No: **G104-07/08**

Original Proposal

Sections: 419.2, 419.3, 508.2.4, 508.3.3

Proponent: Steven R. Winkel, FAIA, PE, The Preview Group, Inc., representing the American Institute of Architects; Stephan Kiefer, CBO, City of Livermore Building Division, CA

1. Revise as follows (2007 Supplement Live work units):

419.2 (Supp) Occupancies. Live/work units shall be classified as a Group R-2 occupancy. Separation requirements found in Sections 420 and 508 ~~508-3~~ shall not apply within the live/work unit when the live/work unit is in compliance with Section 419. High-hazard and storage occupancies shall not be permitted in a live/work unit. The aggregate of storage in the live/work unit shall be limited to 10 percent of the space dedicated to nonresidential activities.

2. Revise as follows (2006 Code Section 419, Group I-1, R-1, R-2 and R-3):

419.2 (Supp) Separation walls. Walls separating dwelling units in the same building ~~and~~ walls separating sleeping units in the same building and walls separating dwelling or sleeping units from other occupancies contiguous to them in the same building shall be constructed as fire partitions in accordance with Section 708.

419.3 (Supp) Horizontal separation. Floor assemblies separating dwelling units in the same buildings and floor assemblies separating sleeping units in the same building and floor assemblies separating dwelling or sleeping units from other occupancies contiguous to them in the same building shall be constructed as horizontal assemblies in accordance with Section 711.

3. Revise as follows:

508.2.4 (Supp) Separation of occupancies. No separation is required between accessory occupancies and the main occupancy.

Exceptions:

1. Group H-2, H-3, H-4 and H-5 occupancies shall be separated from all other occupancies in accordance with Section 508.4.
2. Incidental accessory occupancies required to be separated or protected by Section 508.2.5.
3. ~~Group R occupancies shall be separated from other accessory occupancies in accordance with Section 508.4.4.~~ Group I-1, R-1, R-2 and R-3 dwelling units and sleeping units shall be separated from other dwelling or sleeping units and from accessory occupancies contiguous to them per the requirements of Section 419.

508.3.3 (Supp) Separation. No separation is required between nonseparated occupancies.

Exceptions:

1. Group H-2, H-3, H-4 and H-5 occupancies shall be separated from all other occupancies in accordance with Section 508.3.3.
2. ~~All Group R occupancies shall be separated from other occupancies in accordance with Section 508.4.4.~~ Group I-1, R-1, R-2 and R-3 dwelling units and sleeping units shall be separated from other dwelling or sleeping units and from other occupancies contiguous to them in accordance with the requirements of Section 419.

Reason: This proposal is an amendment to the changes made by G140-06/07 during the last code change cycle. The changes made by G140-06/07 had an overbroad scope that we believe went beyond the intent of what that code change proposal was attempting to accomplish. This amendment adjusts the scope of that prior code change to clarify the application of separation requirements while retaining what we believe was its intended scope of application. G140-06/07 as adopted requires broad application of separated occupancy provisions for all R occupancies for what otherwise should be considered as accessory or nonseparated occupancies. It is our belief that the problem G140-06/07 was attempting to address was to define where separations are required between dwelling units or sleeping units and the other portions of what are otherwise considered accessory or nonseparated occupancies. This condition occurs at the walls or floors where a group of dwelling or sleeping units ends in relationship to the rest of the mixed use building. The purpose of this proposal is the same as what we believe were the goals of G140-06/07,

CODE CHANGES RESOURCE COLLECTION – INTERNATIONAL BUILDING CODE

which is to clarify that separations between dwelling or sleeping units are still required, including at the perimeter wall or floor of a group of dwelling units or sleeping units. The original proposal was meant to apply for accessory or nonseparated uses as does the new proposal. The proposal defines when the accessory or nonseparated parts of a mixed use facility are to provide separations for dwelling units or sleeping units. The previous change applies broadly throughout R occupancies and effectively negates the use of accessory and nonseparated code provisions in those occupancies. We believe this proposal more accurately defines where the rated partitions and horizontal assemblies that are to separate portions of a building from each other begin and end. We consider that this proposal defines what is required at the wall or floor that surrounds a group of dwelling units or sleeping units where the surrounding wall or floor abuts another occupancy in a mixed use building. For example the wall at a sleeping unit in an R-1 occupancy (dwelling unit at an R-2 occupancy) which is contiguous to an adjacent retail space or restaurant would need to be rated based on the presence of sleeping or dwelling units, and the fact that the walls between the units and the other occupancy are contiguous. However, under the new proposal other parts of what otherwise could be considered as non-sleeping spaces in the R occupancy, such as the lobby, a restaurant or a gift shop could be treated as accessory or nonseparated uses in the way they relate to each other in the public parts of the facility. That would not be the case if the language from G140-6/07 remains in the code. The currently adopted language applies throughout the R occupancy, not just at the dwelling units or sleeping units. While the impact of the original proposal would be the greatest in R-1 occupancies where such mixed uses occur most often, we believe the requirements for separations between dwelling units or sleeping units should apply in all occupancies covered by Section 420 and the scope of application should be clarified for all of the occupancies covered by Section 420.

We have also included clarifications related to the new provisions for live/work units contained in Section 419 to make it clear that the supplementary separation requirements contained in Sections 420 and 508 are to be applied between separate live work units, not within the live/work unit. This clarifies that if the live/work units meets the criteria of Section 419 then the dwelling and livelihood related uses inside the unit are allowed to be nonseparated.

The modifications to Section 420 are to clarify the requirements for fire barriers and horizontal assemblies by adding the requirement for separation from contiguous occupancies in addition to the separations between dwelling units or sleeping units already contained in this code section.

Cost Impact: The code change proposal will not increase the cost of construction from the provisions contained in the 2007 Accumulative Supplement.

Analysis: Section 419 as referenced in items 2,3 and 4 of this proposal refers to the 2006 section titled Group I-1, R-1, R-2 and R-3. Section 420 as referenced in Item 1 of this proposal is intended to reference the same section but has been renumbered to work with the introduction of the new Section 419 (Supp) dealing with Live/Work units.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The proposal clarifies the separation requirements in the current Section 419 of the code and how it applies to live/work units and mixed use occupancy requirements.

Assembly Action:

None

Final Hearing Results

G104-07/08

AS

Code Change No: **G106-07/08**

Original Proposal

Sections: 419.4 (New); IRC R304.5 (New); IPC Table 403.1 (IBC [P] Table 2902.1)

Proponent: Dave Collins, AIA, The Preview Group, Inc., representing the AIA Codes Committee

THESE PROPOSALS ARE ON THE AGENDA FOR THE IBC GENERAL, IRC BUILDING ENERGY CODE, AND IPC DEVELOPMENT COMMITTEES AS 3 SEPARATE CODE CHANGES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IBC GENERAL

Add new text as follows:

419.4 Arrangement of dwelling units and sleeping units. Dwelling units and sleeping units shall comply with the Sections 419.4.1 through 419.4.8

419.4.1 Dwelling units. Every dwelling unit shall contain its own bathtub or shower, lavatory, water closet and kitchen sink. The lavatory shall be placed in the same room as the water closet or located in close proximity to the door leading directly into the room in which such water closet is located. A kitchen sink shall not be used as a substitute for the required lavatory.

419.4.2 Access from sleeping areas. Sleeping areas within a dwelling unit or sleeping unit shall not constitute the only means of access to other sleeping areas or habitable spaces and shall not serve as the only means of egress from other habitable spaces.

Exception: Dwelling units and sleeping units that contain fewer than two bedrooms.

419.4.3 Water closet access. Every sleeping area of a dwelling unit or sleeping unit shall have access to at least one water closet and one lavatory without passing through another sleeping area. Every sleeping area in a dwelling unit or sleeping unit shall have access to at least one water closet and lavatory located on the same story as the sleeping area or on an adjacent story.

419.4.4 Congregate living facilities. In congregate living facilities, provide fixtures in accordance with Table 2902.1.

419.4.5 Group R-1 occupancies. In Group R-1 occupancies, where private water closets, lavatories and baths are not provided within a sleeping unit, one water closet, one lavatory and one bathtub or shower having access from a public hallway shall be provided for each ten occupants.

419.4.6 Privacy. Toilet rooms and bathrooms shall provide privacy and shall not constitute the only passageway to a hall, a habitable space, or to the exterior. A door and interior locking device shall be provided for all common or shared bathrooms and toilet rooms in a congregate living facility or a Group R-1 occupancy.

419.4.7 Bathroom access. Common use bathrooms serving sleeping units shall have access without passing through another sleeping area. Common use bathrooms shall be located on the same story as the sleeping unit or on an adjacent story.

419.4.8 Food preparation. All spaces to be occupied for food preparation purposes shall contain suitable space and equipment to store, prepare and serve foods in a sanitary manner. There shall be adequate facilities and services for the sanitary disposal of food wastes and refuse, including facilities for temporary storage.

PART II – IRC BUILDING/ENERGY

Add new text as follows:

R304.5 Arrangement of dwelling units and sleeping units. Dwelling units and sleeping units shall comply with the Sections R304.5.1 through R304.5.5

R304.5.1 Dwelling units. Every dwelling unit shall contain its own bathtub or shower, lavatory, water closet and kitchen sink. The lavatory shall be placed in the same room as the water closet or located in close proximity to the door leading directly into the room in which such water closet is located. A kitchen sink shall not be used as a substitute for the required lavatory.

R304.5.2 Access from sleeping areas. Sleeping areas within a dwelling unit or sleeping unit shall not constitute the only means of access to other sleeping areas or habitable spaces and shall not serve as the only means of egress from other habitable spaces.

Exception: Dwelling units and sleeping units that contain fewer than two bedrooms.

R304.5.3 Water closet access. Every sleeping area of a dwelling unit or sleeping unit shall have access to at least one water closet and one lavatory without passing through another sleeping area. Every sleeping area in a dwelling unit or sleeping unit shall have access to at least one water closet and lavatory located on the same story as the sleeping area or on an adjacent story.

R304.5.4 Congregate living facilities. In congregate living facilities, at least one water closet and lavatory shall be provided for each 10 occupants. In addition, at least one bathtub or shower shall be provided for each 8 occupants.

R304.5.4 Privacy. Toilet rooms and bathrooms shall provide privacy and shall not constitute the only passageway to a hall, a habitable space, or to the exterior. A door and interior locking device shall be provided for all common or shared bathrooms and toilet rooms in a congregate residence.

R304.5.5 Bathroom access. Common use bathrooms serving sleeping units shall have access without passing through another sleeping area. Common use bathrooms shall be located on the same story as the sleeping unit or on an adjacent story.

R304.5.6 Food preparation. All spaces to be occupied for food preparation purposes shall contain suitable space and equipment to store, prepare and serve foods in a sanitary manner. There shall be adequate facilities and services for the sanitary disposal of food wastes and refuse, including facilities for temporary storage.

PART III – IPC

Revise table as follows:

**TABLE 403.1 (IBC [P] Table 2902.1)
MINIMUM NUMBER OF REQUIRED PLUMBING FIXTURES^a
(See Sections 403.2 (IBC [P] 2902.2) and 403.3 (IBC [P] 2902.3))**

No.	CLASSIFICATION	OCCUPANCY	DESCRIPTION	WATER CLOSETS (Urinals see Section 419.2)	LAVATORIES	BATHTUBS/SHOWERS	DRINKING FOUNTAINS (See Section 410.1)	OTHER
7	Residential	R-3	Congregate living facilities with 16 or fewer person	1 per 10	1 per 10	1 per 8	1 per 100	1 service sink

(Portions of table and footnotes not shown do not change)

Reason: The *International Property Maintenance Code* contains provisions which address the design of dwelling units, congregate residences, hotels, motels and boarding houses. Except for a portion of IPMC Sec. 404.4.2, none of these provisions are contained in either the IBC or IRC. It is therefore possible for a building to be designed and approved under the IBC and receive a certificate of occupancy that would then be immediately out of compliance with the IPMC. The IPMC should not have requirements that have to be maintained that are not required when a building is constructed. The solution is to either put them into the IBC and IRC or to delete them from the IPMC. This is one of two proposals to add these requirements into the construction codes. The proponent has also submitted an alternative proposal to delete the requirements from the IPMC. For the codes to be coordinated, either amendment of IBC and IRC or IPMC must be accomplished.

The concept behind the proposal was to concentrate the requirements in Section 419. Other locations were considered including Chapter 12, 10 and 29, however the proposal concentrates the items in 419 for the convenience of the code users. The provisions of the IPMC provisions which are the basis of this proposal are below. The intent of the proposal was to replicate these provisions into the IBC with identical language where appropriate. However, the IPMC uses terms which are not used in the IBC. Therefore certain changes were made. For example, "bedroom" was changed to "sleeping area"; "rooming unit", "dormitory unit", and "housekeeping unit" were replaced with sleeping unit, congregate living facility or Group R1 occupancy as appropriate.

The current requirements in the IPMC is in conflict with what is required in Group R-4 homes in the IPC (i.e. one water closet and lavatory for each 10 occupants and one bath/shower for each 8 occupants).

The current IPMC does not allow for shared bathrooms in hotels or group home by requiring hall access in IPMC Section 503.2. This revised text here is worded to require access without going through another sleeping area, but will allow private baths or baths shared between two sleeping units.

2006 IBC, Section 310.1 allows congregate living facilities with 16 or fewer persons to be considered Group R-3. The current IPC does specify requirements for bathroom in congregate living facilities for Group R-3. The proposed addition to IPC Table 403.1 (IBC Table 2902.1) will mirror what is required for larger congregate living facilities under Group R-2 and assisted living facilities under Group R-4.

Provisions of the 2006 IPMC

404.4.2 Access from bedrooms. Bedrooms shall not constitute the only means of access to other bedrooms or habitable spaces and shall not serve as the only means of egress from other habitable spaces.

Exception: Units that contain fewer than two bedrooms.

404.4.3 Water closet accessibility. Every bedroom shall have access to at least one water closet and one lavatory without passing through another bedroom. Every bedroom in a dwelling unit shall have access to at least one water closet and lavatory located in the same story as the bedroom or an adjacent story.

404.7 Food preparation. All spaces to be occupied for food preparation purposes shall contain suitable space and equipment to store, prepare and serve foods in a sanitary manner. There shall be adequate facilities and services for the sanitary disposal of food wastes and refuse, including facilities for temporary storage.

502.1 Dwelling units. Every dwelling unit shall contain its own bathtub or shower, lavatory, water closet and kitchen sink which shall be maintained in a sanitary, safe working condition. The lavatory shall be placed in the same room as the water closet or located in close proximity to the door leading directly into the room in which such water closet is located. A kitchen sink shall not be used as a substitute for the required lavatory.

502.2 Rooming houses. At least one water closet, lavatory and bathtub or shower shall be supplied for each four rooming units.

502.3 Hotels. Where private water closets, lavatories and baths are not provided, one water closet, one lavatory and one bathtub or shower having access from a public hallway shall be provided for each ten occupants.

503.1 Privacy. Toilet rooms and bathrooms shall provide privacy and shall not constitute the only passageway to a hall or other space, or to the exterior. A door and interior locking device shall be provided for all common or shared bathrooms and toilet rooms in a multiple dwelling.

503.2 Location. Toilet rooms and bathrooms serving hotel units, rooming units or dormitory units or housekeeping units, shall have access by traversing not more than one flight of stairs and shall have access from a common hall or passageway.

Cost Impact: This is simply a correlation among the codes and should have no cost impact.

Public Hearing Results

PART I – IBC GENERAL

Committee Action:

Disapproved

Committee Reason: The committee expressed concerns regarding possible contradictions with other Building Code requirements, specifically on plumbing fixture counts. Also it was suggested that this may better fit within Chapter 12.

Assembly Action:

None

PART II – IRC-B/E

Committee Action:

Disapproved

Committee Reason: The proposed change contains undefined terms including close proximity and congregate living facilities and other language that is not appropriate for use in the IRC.

Assembly Action:

None

PART III – IPC

Committee Action:

Approved as Submitted

Committee Reason: The IPC needs to be in alignment with the IEBC and IBC with regard to Group R-3 occupancies being used as congregate living facilities. To avoid any confusion as to the number of plumbing fixtures required for such facilities, a new row for R-3 for congregate living facilities makes it clear that the fixture requirements are not any different than for R-2 dormitories or R-4 assisted living facilities.

Assembly Action:

None

Final Hearing Results

G106-07/08, Part I	D
G106-07/08, Part II	D
G106-07/08, Part III	AS

Code Change No: G109-07/08

Original Proposal

Sections: 421 (New), 202 (New), Chapter 35 (New); IRC R325 (New), Chapter 43 (New)

Proponent: Marc Levitan, LSU Hurricane Center, representing the ICC/NSSA Storm Shelter Committee

THESE PROPOSALS ARE ON THE AGENDA OF THE IBC GENERAL AND IRC BUILDING/ENERGY CODE DEVELOPMENT COMMITTEES AS 2 SEPARATE CODE CHANGES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IBC GENERAL

1. Add new text as follows:

SECTION 421 **STORM SHELTERS**

421.1 General. In addition to other applicable requirements in this code, storm shelters shall be constructed in accordance with ICC/NSSA-500.

421.1.1 Scope. This section applies to the construction of storm shelters constructed as separate detached buildings or constructed as safe rooms within buildings for the purpose of providing safe refuge from storms that produce high winds, such as tornados and hurricanes. Such structures shall be designated to be hurricane shelters, tornado shelters, or combined hurricane and tornado shelters.

421.2 Definitions. The following words and terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

STORM SHELTER. A building, structure, or portions(s) thereof, constructed in accordance with ICC-500 and designated for use during a severe wind storm event such as a hurricane or tornado.

Community Storm Shelter. A storm shelter not defined as a Residential Storm Shelter.

Residential Storm Shelter. A storm shelter serving occupants of dwelling units and having an occupant load not exceeding 16 persons.

2. Add new definition as follows:

**SECTION 202
DEFINITIONS**

STORM SHELTER. See Section 421.2

3. Add standard to Chapter 35 as follows:

ICC

ICC 500-08 ICC/NSSA Standard on the Design and Construction of Storm Shelters

PART II – IRC BUILDING/ENERGY

1. Add new text as follows:

**SECTION R325
STORM SHELTERS**

R325.1 General. This section applies to the construction of storm shelters constructed as separate detached buildings or constructed as safe rooms within buildings for the purpose of providing safe refuge from storms that produce high winds, such as tornados and hurricanes. In addition to other applicable requirements in this code, storm shelters shall be constructed in accordance with ICC/NSSA-500.

2. Add standard to Chapter 43 follows:

ICC

ICC 500 -08 ICC/NSSA Standard on the Design and Construction of Storm Shelters

Reason: These proposed changes to the IBC are intended to bring the new ICC Storm Shelter standard into the code as a referenced document for the construction of storm shelters. This standard establishes minimum requirements for structures and spaces designated as hurricane, tornado, or combination shelters. The standard addresses the design of such shelters from the perspective of the structural requirements for high wind conditions, as well as addressing minimum requirements for the interior environment during a storm event. A companion change is being proposed for the IRC.

Cost Impact: This code change will not increase the cost of construction.

Public Hearing Results

PART I – IBC STRUCTURAL

Committee Action:

Disapproved

Committee Reason: The committee supports the addition of the proposed storm shelter reference standard to the building code and does not take any technical issues with that document. The committee's disapproval is based on the standard not yet being finalized and it is hoped that the proponent will submit a public comment to allow this standard to be accepted at the final action hearings.

Assembly Action:

None

PART II – IRC

Committee Action:

Approved as Modified

Modify proposal as follows:

R325.1 General. This section applies to the construction of storm shelters when constructed as separate detached buildings or when constructed as safe rooms within buildings for the purpose of providing safe refuge from storms that produce high winds, such as tornados and hurricanes. In addition to other applicable requirements in this code, storm shelters shall be constructed in accordance with ICC/NSSA-500.

(Portions of proposal not shown remain unchanged)

Committee Reason: This change brings a new standard into the code for the construction of storm shelters. The modification clarifies that a storm shelter is not required but when one is constructed it must comply with ICC/NSSA-500.

Assembly Action:**None**

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because public comments were submitted.

Public Comment 1:

Marc Levitan, LSU Hurricane Center, representing the ICC/NSSA Storm Shelter Committee, requests Approval as Submitted for Part I.

Commenter-s Reason: The IBC-Structural Committee disapproved this code change because the standard proposed for inclusion in the code, ICC 500, was not finalized. Since that time, the ICC/NSSA Storm Shelter Committee has completed its work, submitted the standard to ANSI for approval, received approval, and published the standard. Other than the objections stated regarding the completion of the standard, the committee had no other technical concerns or issues regarding this proposed code change. Given that the standard proposed for reference is now complete and in compliance with the ICC criteria for referenced standards given in ICC Council Policy no. CP 28, the ICC/NSSA Storm Shelter Committee request approval of the proposed code change G109-07/08 Part I "As Submitted."

Public Comment 2:

Joseph J. Messersmith, Jr., PE, Portland Cement Association, requests Approval as Submitted for Part I.

Commenter-s Reason: As indicated in the committee reason, the change to reference ICC/NSSA-500 in the IBC was disapproved because the standard was not complete. It should be noted that Part II of this change to reference this new standard in the IRC was approved as modified in Palm Springs. Since the Palm Springs hearings, the standard has been completed and the membership is urged to overturn the motion for disapproval and subsequently vote to approve Part I of the change.

Public Comment 3:

Roger Robertson, Chesterfield County Virginia, representing the ICC Storm Shelter Committee, requests Approval as Submitted for Part I.

Commenter-s Reason: The IBC General Committee disapproved the proposal based on the standard not yet having received ANSI accreditation. The committee suggested a public comment requesting approval be submitted once accreditation was received.

Final Hearing Results

G109-07/08, Part I	AS
G109-07/08, Part II	AM

Code Change No: G112-07/08

Original Proposal

Section: 502

Proponent: Robert Bagnetto, Lapeyre Stair, Inc.

Revise as follows:

**SECTION 502
DEFINITIONS**

EQUIPMENT PLATFORM. An unoccupied, elevated platform used exclusively for mechanical systems or industrial process equipment, including the associated elevated walkways, stairs, alternating tread devices and ladders necessary to access the platform (see Section 505.5).

Reason: The purpose of this proposed change to IBC-2006 is to allow the use of alternating tread devices as an access component to equipment platforms.

The proposed change is superior to the current provisions of the code in that it provides the option of using an additional type of access component to equipment platforms that is suitable for such application and that is not currently allowed by the code. IBC-2006 section 502 is overly restrictive in that it does not allow the use of alternating tread devices as an access component to equipment platforms, but does allow ladders for such use. (Or the intent of section 502 is to imply that other access components such as alternating tread devices are allowed, but this is not clearly stated).

Alternating tread devices have been shown by the scientific study "Performance, perceived safety and comfort of the alternating tread stair" to be an acceptable vertical access component and preferred over ships' ladders. Alternating tread devices have been successfully used as an access component to equipment platforms for approximately 25 years. Alternating tread devices, by virtue of their features (i.e. 50 to 70° angle, larger tread size and size rails) are typically safer to use than vertical ladders and are suitable for the application specified in section 502. . . IBC-2006 currently allows use of alternating tread devices for accesses such as to mezzanines, boiler incinerator and furnace rooms, refrigeration machinery rooms, gallery gridirons and catwalks, unoccupied roofs, etc. Also, access to equipment platforms is a primary intended use for alternating tread devices, especially since they can be used such that tools can be carried up or down the device.

Alternating tread devices were patented and 1981 and their use to equipment platforms has been allowed by the Occupational Safety and Health Administration (OSHA) since December of 1981. Alternating tread devices were allowed as an access component to equipment platforms per The BOCA National Building Code/1999 and the 1997 Uniform Building Code, which were precursor codes to IBC. Alternating tread devices are also allowed to be used as an access component to equipment platforms under NFPA-101, 2006.

Bibliography:

- OHSA instruction STD 1-1.11, dated 4/26/82
- Letter dated 12/2/81 from Mark Cowan (OHSA) to Dale Ordoyne (Lapeyre Stair)
- Performance, perceived safety and comfort of the alternating tread stair* by Jorna, Mohageg & Synder, Virginia Polytechnic Institute and State University, published Applied Ergonomics 1989.20.1,26-32
- The BOCA National Building Code/1999, section 2805.2.5
- 1997 Uniform Building Code, section 1003.3.3.1
- Letter dated 10/20/87 from Tom Briggs (ICBO) to J. Robert Nelson (PFS Corp.)
- NFPA-101, 2006, section 7.2.11.1 (3)
- IBC-2006 sections 1009.1, 1015.3, 1015.4, 1015.6.1

Cost Impact: The code change proposal could minimally affect the cost of construction if alternating tread devices are used in lieu of ladders for access to equipment platforms.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The proposal is approved to be consistent with the committee action on G94-07/08. A ladder is already permitted, so it is reasonable to also allow alternating tread devices.

Assembly Action:

None

Final Hearing Results

G112-07/08

AS

Code Change No: G115-07/08

Original Proposal

Table 503

Proponent: Kate Dargan and David Collins, Co-Chairs, Code Technology Committee (CTC) Balanced Fire Protection Features Study Group

Revise table as follows:

TABLE 503
ALLOWABLE HEIGHT AND BUILDING AREAS^a
 Height limitations shown as stories and feet above grade plane.
 Area limitations as determined by the definition of "Area, building," per story

GROUP	HGT(feet) HGT(S)	TYPE OF CONSTRUCTION								
		TYPE I		TYPE II		TYPE III		TYPE IV	TYPE V	
		A	B	A	B	A	B	HT	A	B
		UL	160	65	55	65	55	65	50	40
B	S	UL	11	5	4 3	5	4 3	5	3	2
	A	UL	UL	37,500	23,000	28,500	19,000	36,000	18,000	9,000

(Portions of table and footnotes not shown remain unchanged)

Reason: One area of concern identified for study by the Height and Area Task Group was 4 and 5 story buildings of unrated construction. The table below shows the occupancies in the IBC where that condition exists for sprinklered construction. In addition, the table shows the sprinklered height allowances for these occupancies in the legacy codes.

**Type IIB, Type IIIB (Unprotected Construction)
 Story Comparison (w/ NFPA 13 Sprinklers)**

	SBC	NBC	UBC	2006 IBC
B	5	4	2	5
F-2	4	4	2	4
M	5	3	2	5
S-1	4	3	2	4
S-2	4	4	2	5
R* (13)	5	4	4	5
R*(13R)	4	4	3	4

NA- Not Applicable NP- Not Permitted

* - Applies for R-1, R-2 and R-3 Use Groups

The study group noted that for Use Group B, M, S-1, and R buildings of Type IIB or Type IIIB construction, the allowance for 4 or 5 stories in the IBC was premised on the story heights allowed in the SBC. In all these instances, the SBC sprinklered height allowance for these Use Groups relied on a multiple story sprinkler increase. For example, for Use Group B, the SBC allowed 2 stories for unsprinklered construction and 5 stories for sprinklered construction. This exceeds the consistent one story sprinkler height increase incorporated in the IBC height and area provisions. Based on this review, the study group identified two anomalies from what was permitted by the legacy codes. First, the story height allowance for S-2 use groups is not based on any of the legacy code allowances. Second, for Use Group B, M, S-1, and R (Type IIB and IIIB construction), the IBC story height allowance for unsprinklered construction exceeds what was allowed by any of the legacy codes. For example, the maximum height for an unsprinklered Type IIB office building in any of the legacy codes was the NBC allowance for 3 stories. Currently, the IBC allows 4 stories for this condition. Rather than modify the sprinkler increase in the IBC, the study group suggested the following recommended story height changes:

Unsprinklered IBC Table 503 Values

Use Group	IIB	IIIB
B	3	3
M	2	2
S-1	2	2
S-2	3	3
R* (13)	3	3

* - Applies for R-1, R-2 and R-3 Use Groups

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In essence, these reductions would eliminate the anomalies created by the multi-story SBC sprinkler increase and drop the IBC value back to the next least restrictive legacy code (in these cases, the NBC).

The study group noted that the motivation for these recommendations was to address anomalies associated with unsprinklered 4 and 5 story buildings of nonrated construction. No evidence was submitted to suggest that the existing sprinklered height allowances for these buildings in either the IBC or the legacy codes had created an unsafe condition that requires correction.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: Large losses in B occupancies are not seen in any of the 3 legacy code areas, thus taking the least restrictive approach is justified. The focus should be on the IBC not on the legacy codes at this point in time.

Assembly Action:

None

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Kate Dargan and David Collins, Co-Chairs, Code Technology Committee (CTC) Balanced Fire Protection Features Study Group, requests Approval as Submitted.

Commenter's Reason: Although the proposal will reduce the allowable height of Group B buildings of Types IIB and IIIB construction by one story, the maximum area (total of all stories) of the tallest building that will then be permitted is generally considerably greater than that permitted by any of the legacy codes (see table below). For example, consider an unsprinklered Type IIB business building with a height of 3 stories; the tallest permitted by any of the legacy codes. If less than 20 feet of open space is provided around the building, the IBC permits the aggregate area of all three stories to be 100% greater than the largest total area permitted by the legacy codes. If the width of the open space is increased to 40 feet, the IBC's total area is still 22% greater than that permitted by the largest legacy code. Although allowable heights are proposed to be reduced, the foregoing illustrates that buildings will still be able to have total areas that are comparable to or greater than permitted by the legacy codes.

Occupancy Group	Type of Construction	NFPA 13 Sprinklers – Yes/No	Width of Open Space ^b (ft.) ^a	Ratio of IBC Maximum Building Area to the Largest Maximum Building Area Permitted by Legacy Codes				
				Number of Stories				
				1	2	3	4	5
B	IIB	No	< 20	1.35	1.35	2.00	NPLC	NP
			40	1.12	1.12	1.22	NPLC	NP
		Yes	< 20	1.80	1.60	2.03	1.52	1.22
			40	1.52	1.33	1.69	1.27	1.01
	IIIB	No	< 20	1.32	1.32	1.65	NPLC	NP
			40	0.92	0.92	1.00	NPLC	NP
		Yes	< 20	1.76	1.32	2.04	1.53	1.22
			40	1.25	1.10	1.50	1.12	1.02

NPLC means not permitted by any of the legacy codes, but permitted by IBC.

NP means not permitted by any of the legacy codes or IBC.

If G115 is approved, building heights represented by shaded cells will not be permitted by the IBC.

a. Width of open space around 100% of building perimeter.

b. 40 feet was used because the UBC required a minimum of 40 feet of open space on all sides in order to qualify for 100% area increase; the maximum permitted by that code. The NBC and SBC permitted maximum open space increases of 150% and 100%, respectively, at 30 feet.

Code issues are assigned to the CTC by the ICC Board as "areas of study". Information on the CTC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CTC effort can be downloaded from the following website: <http://www.iccsafe.org/cs/cc/ctc/index.html>. This public comment is a result of the CTC's investigation of the area of study entitled "Balanced Fire Protection". The CTC web page for this area of study is: <http://www.iccsafe.org/cs/cc/ctc/WTC.html>. As part of the CTC process, Study Groups are often formed to address specific issues related to CTC areas of study. The CTC BFP Features Study group is one such study group. This study group was formed subsequent to the 2006 Orlando Code Development Hearings, with the focus being a review of the height and area provisions in the IBC. Since its inception, the study group has held ten meetings - all open to the public.

Final Hearing Results

G115-07/08

AS

Code Change No: **G117-07/08**

Original Proposal

Table 503

Proponent: Kate Dargan and David Collins, Co-Chairs, Code Technology Committee (CTC) Balanced Fire Protection Features Study Group

Revise as follows:

TABLE 503
ALLOWABLE HEIGHT AND BUILDING AREAS^a
 Height limitations shown as stories and feet above grade plane.
 Area limitations as determined by the definition of "Area, building," per story

GROUP	HGT(S)	TYPE OF CONSTRUCTION								
		TYPE I		TYPE II		TYPE III		TYPE IV	TYPE V	
		A	B	A	B	A	B	HT	A	B
	HGT(feet)									
		UL	160	65	55	65	55	65	50	40
M	S	UL	11	4	4 $\underline{2}$	4	4 $\underline{2}$	4	3	1
	A	UL	UL	21,500	12,500	18,500	12,500	20,500	14,000	9,000

(Portions of table and footnotes not shown remain unchanged)

Reason: One area of concern identified for study by the Height and Area Task Group was 4 and 5 story buildings of unrated construction. The table below shows the occupancies in the IBC where that condition exists for sprinklered construction. In addition, the table shows the sprinklered height allowances for these occupancies in the legacy codes.

Type IIB, Type IIIB (Unprotected Construction)
Story Comparison (w/ NFPA 13 Sprinklers)

	SBC	NBC	UBC	2006 IBC
B	5	4	2	5
F-2	4	4	2	4
M	5	3	2	5
S-1	4	3	2	4
S-2	4	4	2	5
R* (13)	5	4	4	5
R*(13R)	4	4	3	4

NA- Not Applicable NP- Not Permitted

* - Applies for R-1, R-2 and R-3 Use Groups

The study group noted that for Use Group B, M, S-1, and R buildings of Type IIB or Type IIIB construction, the allowance for 4 or 5 stories in the IBC was premised on the story heights allowed in the SBC. In all these instances, the SBC sprinklered height allowance for these Use Groups relied on a multiple story sprinkler increase. For example, for Use Group B, the SBC allowed 2 stories for unsprinklered construction and 5 stories for sprinklered construction. This exceeds the consistent one story sprinkler height increase incorporated in the IBC height and area provisions. Based on this review, the study group identified two anomalies from what was permitted by the legacy codes. First, the story height allowance for S-2 use groups is not based on any of the legacy code allowances. Second, for Use Group B, M, S-1, and R (Type IIB and IIIB construction), the IBC story height allowance for unsprinklered construction exceeds what was allowed by any of the legacy codes. For example, the maximum height for an unsprinklered Type IIB office building in any of the legacy codes was the NBC allowance for 3 stories. Currently, the IBC allows 4 stories for this condition. Rather than modify the sprinkler increase in the IBC, the study group suggested the following recommended story height changes:

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Unsprinklered IBC Table 503 Values

Use Group	IIB	IIIB
B	3	3
M	2	2
S-1	2	2
S-2	3	3
R* (13)	3	3

* - Applies for R-1, R-2 and R-3 Use Groups

In essence, these reductions would eliminate the anomalies created by the multi-story SBC sprinkler increase and drop the IBC value back to the next least restrictive legacy code (in these cases, the NBC).

The study group noted that the motivation for these recommendations was to address anomalies associated with unsprinklered 4 and 5 story buildings of nonrated construction. No evidence was submitted to suggest that the existing sprinklered height allowances for these buildings in either the IBC or the legacy codes had created an unsafe condition that requires correction.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The lifesafety statistics for Group M occupancies in the IBC has been better than for the legacy codes therefore decreases in the height limitations are not warranted.

Assembly Action:

None

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Kate Dargan and David Collins, Co-Chairs, Code Technology Committee (CTC) Balanced Fire Protection Features Study Group, requests Approval as Submitted.

Commenters Reason: Although the proposal will reduce the allowable height of Group M buildings of Types IIB and IIIB construction by two stories, the maximum area (total of all stories) of the tallest building that will then be permitted is generally greater than that permitted by any of the legacy codes, especially where sprinklers are provided (see table below). For example, consider an unsprinklered Type IIB mercantile building with a height of 2 stories; the tallest permitted by any of the legacy codes. If less than 20 feet of open space is provided around the building, the IBC permits the aggregate area of both stories to be 4% greater than the largest total area permitted by the legacy codes. If the width of the open space is increased to 40 feet, the IBC's total area is 9% less than that permitted by the largest legacy code. Where sprinklers are provided in the Type IIB building with less than 20 feet of open space, 3 stories will be permitted, and the maximum area permitted by the IBC will be 108% greater than that permitted by the largest legacy code. Although allowable heights are proposed to be reduced, the foregoing illustrates that buildings will still be able to have total areas that are comparable to or greater than permitted by the legacy codes.

Occupancy Group	Type of Construction	NFPA 13 Sprinklers – Yes/No	Width of Open Space (ft.) ^a	Ratio of IBC Maximum Building Area to the Largest Maximum Building Area Permitted by Legacy Codes				
				Number of Stories				
				1	2	3	4	5
M	IIB	No	< 20	1.04	1.04	NPLC	NPLC	NP
			40	0.91	0.91	NPLC	NPLC	NP
		Yes	< 20	1.39	1.30	2.08	1.56	1.25
			40	0.82	0.98	1.48	1.30	1.04
	IIIB	No	< 20	1.04	1.04	NPLC	NPLC	NP
			40	0.91	0.91	NPLC	NPLC	NP
		Yes	< 20	1.39	1.30	2.08	1.56	1.25
			40	0.82	0.98	1.48	1.30	1.04

NPLC means not permitted by any of the legacy codes, but permitted by IBC.

NP means not permitted by any of the legacy codes or IBC.

If G117 is approved, building heights represented by shaded cells will not be permitted by the IBC.

- a. Width of open space around 100% of building perimeter.
- b. 40 feet was used because the UBC required a minimum of 40 feet of open space on all sides in order to qualify for 100% area increase; the maximum permitted by that code. The NBC and SBC permitted maximum open space increases of 150% and 100%, respectively, at 30 feet.

Code issues are assigned to the CTC by the ICC Board as "areas of study". Information on the CTC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CTC effort can be downloaded from the following website: <http://www.iccsafe.org/cs/cc/ctc/index.html>. This public comment is a result of the CTC's investigation of the area of study entitled "Balanced Fire Protection". The CTC web page for this area of study is: <http://www.iccsafe.org/cs/cc/ctc/WTC.html>. As part of the CTC process, Study Groups are often formed to address specific issues related to CTC areas of study. The CTC BFP Features Study group is one such study group. This study group was formed subsequent to the 2006 Orlando Code Development Hearings, with the focus being a review of the height and area provisions in the IBC. Since its inception, the study group has held ten meetings - all open to the public.

Final Hearing Results

G117-07/08

AS

Code Change No: G119-07/08

Original Proposal

Table 503

Proponent: Kate Dargan and David Collins, Co-Chairs, Code Technology Committee (CTC) Balanced Fire Protection Features Study Group

Revise table as follows:

TABLE 503
ALLOWABLE HEIGHT AND BUILDING AREAS^a
 Height limitations shown as stories and feet above grade plane.
 Area limitations as determined by the definition of "Area, building," per story

GROUP	HGT(S)	TYPE OF CONSTRUCTION								
		TYPE I		TYPE II		TYPE III		TYPE IV	TYPE V	
		A	B	A	B	A	B	HT	A	B
	HGT(feet)									
		UL	160	65	55	65	55	65	50	40
S-1	S	UL	11	4	3 2	3	3 2	4	3	1
	A	UL	48,000	26,000	17,500	26,000	17,500	25,500	14,000	9,000

(Portions of table and footnotes not shown remain unchanged)

Reason: One area of concern identified for study by the Height and Area Task Group was 4 and 5 story buildings of unrated construction. The table below shows the occupancies in the IBC where that condition exists for sprinklered construction. In addition, the table shows the sprinklered height allowances for these occupancies in the legacy codes.

Type IIB, Type IIIB (Unprotected Construction)
Story Comparison (w/ NFPA 13 Sprinklers)

	SBC	NBC	UBC	2006 IBC
B	5	4	2	5
F-2	4	4	2	4
M	5	3	2	5
S-1	4	3	2	4
S-2	4	4	2	5
R* (13)	5	4	4	5
R*(13R)	4	4	3	4

NA- Not Applicable NP- Not Permitted

* - Applies for R-1, R-2 and R-3 Use Groups

The study group noted that for Use Group B, M, S-1, and R buildings of Type IIB or Type IIIB construction, the allowance for 4 or 5 stories in the IBC was premised on the story heights allowed in the SBC. In all these instances, the SBC sprinklered height allowance for these Use Groups relied on a multiple story sprinkler increase. For example, for Use Group B, the SBC allowed 2 stories for unsprinklered construction and

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5 stories for sprinklered construction. This exceeds the consistent one story sprinkler height increase incorporated in the IBC height and area provisions. Based on this review, the study group identified two anomalies from what was permitted by the legacy codes. First, the story height allowance for S-2 use groups is not based on any of the legacy code allowances. Second, for Use Group B, M, S-1, and R (Type IIB and IIIB construction), the IBC story height allowance for unsprinklered construction exceeds what was allowed by any of the legacy codes. For example, the maximum height for an unsprinklered Type IIB office building in any of the legacy codes was the NBC allowance for 3 stories. Currently, the IBC allows 4 stories for this condition. Rather than modify the sprinkler increase in the IBC, the study group suggested the following recommended story height changes:

Unsprinklered IBC Table 503 Values

Use Group	IIB	IIIB
B	3	3
M	2	2
S-1	2	2
S-2	3	3
R* (13)	3	3

* - Applies for R-1, R-2 and R-3 Use Groups

In essence, these reductions would eliminate the anomalies created by the multi-story SBC sprinkler increase and drop the IBC value back to the next least restrictive legacy code (in these cases, the NBC).

The study group noted that the motivation for these recommendations was to address anomalies associated with unsprinklered 4 and 5 story buildings of nonrated construction. No evidence was submitted to suggest that the existing sprinklered height allowances for these buildings in either the IBC or the legacy codes had created an unsafe condition that requires correction.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: Justification to reduce or revise height and area limitations for buildings based upon the legacy code requirements is not sufficient.

Assembly Action:

None

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Kate Dargan and David Collins, Co-Chairs, Code Technology Committee (CTC) Balanced Fire Protection Features Study Group, request Approval as Submitted.

Commenter's Reason: Although the proposal will reduce the allowable height of Group S-1 buildings of Types IIB and IIIB construction by one story, the maximum area (total of all stories) of the tallest building that will then be permitted is generally greater than that permitted by any of the legacy codes, especially where sprinklers are provided (see table below). For example, consider an unsprinklered Type IIB S-1 storage building with a height of 2 stories; the tallest permitted by any of the legacy codes. If less than 20 feet of open space is provided around the building, the IBC permits the aggregate area of both stories to be 9% greater than the largest total area permitted by the legacy codes. If the width of the open space is increased to 40 feet, the IBC's total area is 4% less than that permitted by the largest legacy code. Where sprinklers are provided in the Type IIB building with less than 20 feet of open space, 3 stories will be permitted, and the maximum area permitted by the IBC will be 64% greater than that permitted by the largest legacy code. Although allowable heights are proposed to be reduced, the foregoing illustrates that buildings will still be able to have total areas that are comparable to or greater than permitted by the legacy codes.

Occupancy Group	Type of Construction	NFPA 13 Sprinklers – Yes/No	Width of Open Space _o (ft.) ^a	Ratio of IBC Maximum Building Area to the Largest Maximum Building Area Permitted by Legacy Codes			
				Number of Stories			
				1	2	3	4
S-1	IIB	No	< 20	1.09	1.09	NPLC	NP
			40	0.96	0.96	NPLC	NP
		Yes	< 20	1.46	1.64	1.64	1.23
			40	1.15	1.37	1.37	1.03
	IIIB	No	< 20	1.09	1.09	NPLC	NP
			40	0.96	0.96	NPLC	NP
		Yes	< 20	1.46	1.64	1.64	1.23
			40	1.15	1.37	1.37	1.03

NPLC means not permitted by any of the legacy codes, but permitted by IBC.

NP means not permitted by any of the legacy codes or IBC.

If G119 is approved, building heights represented by shaded cells will not be permitted by the IBC.

a. Width of open space around 100% of building perimeter.

b. 40 feet was used because the UBC required a minimum of 40 feet of open space on all sides in order to qualify for 100% area increase; the maximum permitted by that code. The NBC and SBC permitted maximum open space increases of 150% and 100%, respectively, at 30 feet.

Code issues are assigned to the CTC by the ICC Board as "areas of study". Information on the CTC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CTC effort can be downloaded from the following website: <http://www.iccsafe.org/cs/cc/ctc/index.html>. This public comment is a result of the CTC's investigation of the area of study entitled "Balanced Fire Protection". The CTC web page for this area of study is: <http://www.iccsafe.org/cs/cc/ctc/WTC.html>. As part of the CTC process, Study Groups are often formed to address specific issues related to CTC areas of study. The CTC BFP Features Study group is one such study group. This study group was formed subsequent to the 2006 Orlando Code Development Hearings, with the focus being a review of the height and area provisions in the IBC. Since its inception, the study group has held ten meetings - all open to the public.

Final Hearing Results

G119-07/08

AS

Code Change No: G120-07/08

Original Proposal

Table 503

Proponent: Kate Dargan and David Collins, Co-Chairs, Code Technology Committee (CTC) Balanced Fire Protection Features Study Group

Revise table as follows:

TABLE 503
ALLOWABLE HEIGHT AND BUILDING AREAS^a
Height limitations shown as stories and feet above grade plane.
Area limitations as determined by the definition of "Area, building," per story

GROUP	HGT(feet) HGT(S)	TYPE OF CONSTRUCTION								
		TYPE I		TYPE II		TYPE III		TYPE IV	TYPE V	
		A	B	A	B	A	B	HT	A	B
		UL	160	65	55	65	55	65	50	40
S-2 ^{b, c}	S	UL	11	5	-4 3	4	-4 3	5	4	2
	A	UL	79,000	39,000	26,000	39,000	26,000	38,500	21,000	13,500

(Portions of table and footnotes not shown remain unchanged)

Reason: One area of concern identified for study by the Height and Area Task Group was 4 and 5 story buildings of unrated construction. The table below shows the occupancies in the IBC where that condition exists for sprinklered construction. In addition, the table shows the sprinklered height allowances for these occupancies in the legacy codes.

Type IIB, Type IIIB (Unprotected Construction)
Story Comparison (w/ NFPA 13 Sprinklers)

	SBC	NBC	UBC	2006 IBC
B	5	4	2	5
F-2	4	4	2	4
M	5	3	2	5
S-1	4	3	2	4
S-2	4	4	2	5
R* (13)	5	4	4	5
R*(13R)	4	4	3	4

NA- Not Applicable NP- Not Permitted

* - Applies for R-1, R-2 and R-3 Use Groups

CODE CHANGES RESOURCE COLLECTION – INTERNATIONAL BUILDING CODE

The study group noted that for Use Group B, M, S-1, and R buildings of Type IIB or Type IIIB construction, the allowance for 4 or 5 stories in the IBC was premised on the story heights allowed in the SBC. In all these instances, the SBC sprinklered height allowance for these Use Groups relied on a multiple story sprinkler increase. For example, for Use Group B, the SBC allowed 2 stories for unsprinklered construction and 5 stories for sprinklered construction. This exceeds the consistent one story sprinkler height increase incorporated in the IBC height and area provisions. Based on this review, the study group identified two anomalies from what was permitted by the legacy codes. First, the story height allowance for S-2 use groups is not based on any of the legacy code allowances. Second, for Use Group B, M, S-1, and R (Type IIB and IIIB construction), the IBC story height allowance for unsprinklered construction exceeds what was allowed by any of the legacy codes. For example, the maximum height for an unsprinklered Type IIB office building in any of the legacy codes was the NBC allowance for 3 stories. Currently, the IBC allows 4 stories for this condition. Rather than modify the sprinkler increase in the IBC, the study group suggested the following recommended story height changes:

Unsprinklered IBC Table 503 Values

Use Group	IIB	IIIB
B	3	3
M	2	2
S-1	2	2
S-2	3	3
R* (13)	3	3

* - Applies for R-1, R-2 and R-3 Use Groups

In essence, these reductions would eliminate the anomalies created by the multi-story SBC sprinkler increase and drop the IBC value back to the next least restrictive legacy code (in these cases, the NBC).

The study group noted that the motivation for these recommendations was to address anomalies associated with unsprinklered 4 and 5 story buildings of nonrated construction. No evidence was submitted to suggest that the existing sprinklered height allowances for these buildings in either the IBC or the legacy codes had created an unsafe condition that requires correction.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The proposal was disapproved based upon action on G119-07/08.

Assembly Action:

None

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Kate Dargan and David Collins, Co-Chairs, Code Technology Committee (CTC) Balanced Fire Protection Features Study Group, request Approval as Submitted.

Commenter's Reason: Although the proposal will reduce the allowable height of Group S-2 buildings of Types IIB and IIIB construction by one story, the maximum area (total of all stories) of the tallest building that will then be permitted is generally considerably greater than that permitted by any of the legacy codes, especially where sprinklers are provided (see table below). For example, consider an unsprinklered Type IIB S-2 storage building with a height of 3 stories; the tallest permitted by any of the legacy codes. If less than 20 feet of open space is provided around the building, the IBC permits the aggregate area of all three stories to be 126% greater than the largest total area permitted by the legacy codes. If the width of the open space is increased to 40 feet, the IBC's total area is 37% greater than that permitted by the largest legacy code. Where sprinklers are provided in the Type IIB building with less than 20 feet of open space, 4 stories will be permitted, and the maximum area permitted by the IBC will be 83% greater than that permitted by the largest legacy code. Although allowable heights are proposed to be reduced, the foregoing illustrates that buildings will still be able to have total areas that are comparable to or greater than permitted by the legacy codes.

Occupancy Group	Type of Construction	NFPA 13 Sprinklers – Yes/No	Width of Open Space (ft.) ^a	Ratio of IBC Maximum Building Area to the Largest Maximum Building Area Permitted by Legacy Codes				
				Number of Stories				
				1	2	3	4	5
S-2	IIB	No	< 20	1.44	1.44	2.26	NPLC	NP
			40	1.26	1.26	1.37	NPLC	NP
		Yes	< 20	1.93	1.81	2.44	1.83	NPLC
			40	1.14	1.35	2.03	1.52	NPLC
	IIIB	No	< 20	1.44	1.44	2.26	NPLC	NP
			40	1.26	1.26	1.37	NPLC	NP
		Yes	< 20	1.93	1.81	2.44	1.83	NPLC
			40	1.14	1.35	2.03	1.52	NPLC

NPLC means not permitted by any of the legacy codes, but permitted by IBC.

NP means not permitted by any of the legacy codes or IBC.

If G120 is approved, building heights represented by shaded cells will not be permitted by the IBC.

a. Width of open space around 100% of building perimeter.

b. 40 feet was used because the UBC required a minimum of 40 feet of open space on all sides in order to qualify for 100% area increase; the maximum permitted by that code. The NBC and SBC permitted maximum open space increases of 150% and 100%, respectively, at 30 feet.

Code issues are assigned to the CTC by the ICC Board as “areas of study”. Information on the CTC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CTC effort can be downloaded from the following website: <http://www.iccsafe.org/cs/cc/ctc/index.html>. This public comment is a result of the CTC’s investigation of the area of study entitled “Balanced Fire Protection”. The CTC web page for this area of study is: <http://www.iccsafe.org/cs/cc/ctc/WTC.html>. As part of the CTC process, Study Groups are often formed to address specific issues related to CTC areas of study. The CTC BFP Features Study group is one such study group. This study group was formed subsequent to the 2006 Orlando Code Development Hearings, with the focus being a review of the height and area provisions in the IBC. Since its inception, the study group has held ten meetings - all open to the public.

Final Hearing Results

G120-07/08

AS

Code Change No: G121-07/08

Original Proposal

Table 503, 503.1.2, 504.2, 506.1, 506.2, 506.3, 506.4.1, 508.2.1, 508.2.3, 508.3.2, 508.4.2, 202

Proponent: Philip Brazil, PE, Reid Middleton, Inc., representing himself

Revise table as follows:

TABLE 503
ALLOWABLE HEIGHT AND BUILDING AREAS^a
Height limitations shown as stories and feet above grade plane.
Building area limitations as determined by the definition of “Area, building,” per story

(Portions of table not shown remain unchanged)

For SI: 1 foot = 304.8 mm, 1 square foot = 0.0929m².

A = building area per story, S = stories above grade plane, UL = Unlimited, NP = Not permitted.

a. See the following sections for general exceptions to Table 503:

1. Section 504.2, Allowable height and story increase due to automatic sprinkler system installation.
2. Section 506.2, Allowable building area increase due to street frontage.
3. Section 506.3, Allowable building area increase due to automatic sprinkler system installation.
4. Section 507, Unlimited area buildings.

b. For open parking structures, see Section 406.3.

c. For private garages, see Section 406.1.

d. See Section 415.5 for limitations.

503.1.2 Buildings on same lot. Two or more buildings on the same lot shall be regulated as separate buildings or shall be considered as portions of one building if the height of each building and the aggregate building area of the buildings are within the limitations of Table 503 as modified by Sections 504 and 506. The provisions of this code applicable to the aggregate building shall be applicable to each building.

504.2 (Supp) Automatic sprinkler system increase. Where a building is equipped throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.1, the value specified in Table 503 for maximum height is increased by 20 feet (6096 mm) and the maximum number of stories is increased by one. These increases are permitted in addition to the building area increase in accordance with Sections 506.2 and 506.3. For Group R buildings equipped throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.2, the value specified in Table 503 for maximum height is increased by 20 feet (6096 mm) and the maximum number of stories is increased by one, but shall not exceed 60 feet (18 288 mm) or four stories, respectively.

Exceptions:

1. Buildings, or portions of buildings, classified as a Group I-2 occupancy of Type IIB, III, IV or V construction.
2. Buildings, or portions of buildings, classified as a Group H-1, H-2, H-3 or H-5 occupancy.
3. Fire-resistance rating substitution in accordance with Table 601, Note d.

**SECTION 506
BUILDING AREA MODIFICATIONS**

506.1 General. The building areas limited by Table 503 shall be permitted to be increased due to frontage (*I_f*) and automatic sprinkler system protection (*I_s*) in accordance with the following:

$$A_a = \{A_t + [A_t \times I_f] + [A_t \times I_s]\} \quad \text{Equation 5-1}$$

where:

A_a = Allowable building area per story (square feet).

A_t = Tabular building area per story in accordance with Table 503 (square feet).

I_f = Area increase factor due to frontage as calculated in accordance with Section 506.2.

I_s = Area increase factor due to sprinkler protection as calculated in accordance with Section 506.3.

506.2 Frontage increase. Every building shall adjoin or have access to a public way to receive a building area increase for frontage. Where a building has more than 25 percent of its perimeter on a public way or open space having a minimum width of 20 feet (6096 mm), the frontage increase shall be determined in accordance with the following:

$$I_f = [F / P - 0.25]W / 30 \quad \text{Equation 5-2}$$

where:

I_f = Area increase due to frontage.

F = Building perimeter that fronts on a public way or open space having 20 feet (6096 mm) open minimum width (feet).

P = Perimeter of entire building (feet).

W = Width of public way or open space (feet) in accordance with Section 506.2.1.

506.3 (Supp) Automatic sprinkler system increase. Where a building is equipped throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.1, the building area limitation in Table 503 is permitted to be increased by an additional 200 percent (*I_s* = 2) for buildings with more than one story above grade plane and an additional 300 percent (*I_s* = 3) for buildings with no more than one story above grade plane. These increases are permitted in addition to the height and story increases in accordance with Section 504.2.

Exception: The building area limitation increases shall not be permitted for the following conditions:

1. The automatic sprinkler system increase shall not apply to buildings with an occupancy in Group H-1.
2. The automatic sprinkler system increase shall not apply to the building area of an occupancy in Group H-2 or H-3. For buildings containing such occupancies, the allowable building area shall be determined in accordance with Section 508.3.3.2, with the sprinkler system increase applicable only to the portions of the building not classified as Group H-2 or H-3.
3. Fire-resistance rating substitution in accordance with Table 601, Note e.

506.4.1 (Supp) Area determination. The total allowable building area of a building with more than one story above grade plane shall be determined by multiplying the allowable building area per story (*Aa*), as determined in Section 506.1, by the number of stories above grade plane as listed below:

1. For buildings with two stories above grade plane, multiply by 2;
2. For buildings with three or more stories above grade plane, multiply by 3; and
3. No story shall exceed the allowable building area per story (*Aa*), as determined in Section 506.1, for the occupancies on that story.

Exceptions:

1. Unlimited area buildings in accordance with Section 507.
2. The maximum area of a building equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.2 shall be determined by multiplying the allowable area per story (*Aa*), as determined in Section 506.1, by the number of stories above grade plane.

508.2.1 (Supp) Area limitations. Aggregate accessory occupancies shall not occupy more than 10 percent of the building area of the story in which they are located and shall not exceed the tabular values in Table 503, without building area increases in accordance with Section 506 for such accessory occupancies.

508.2.3 (Supp) Allowable building area and height. The allowable building area and height of the building shall be based on the allowable building area and height for the main occupancy in accordance with Section 503.1. The height of each accessory occupancy shall not exceed the tabular values in Table 503, without increases in accordance with Section 504 for such accessory occupancies. The building area of the accessory occupancies shall be in accordance with Section 508.2.1

508.3.2 (Supp) Allowable building area and height. The allowable building area and height of the building or portion thereof shall be based on the most restrictive allowances for the occupancy groups under consideration for the type of construction of the building in accordance with Section 503.1.

508.4.2 (Supp) Allowable building area. In each story, the building area shall be such that the sum of the ratios of the actual building area of each separated occupancy divided by the allowable building area of each separated occupancy shall not exceed one.

SECTION 202 DEFINITIONS

AREA. (for masonry) See Section 2102.1.

Bedded. See Section 2102.1.

Gross cross-sectional. See Section 2102.1.

Net cross-sectional. See Section 2102.1.

Reason: "Building area" is defined in Section 502.1. "Area" is not defined in the IBC except indirectly in Section 2102.1, which defines "bedded area," "gross cross-sectional area" and "net cross-sectional area" for applying the structural provisions of Chapter 21 on masonry construction. With respect to the nonstructural provisions of the IBC, however, "area" has no technical meaning except to the extent that a technical meaning can be derived from the ordinarily accepted meaning of "area" (refer to Section 201.4). A statement in the title of Table 503 makes it clear that "A" means building area per story. There are instances of "area" elsewhere in Chapter 5, however, where "building area" is intended, for example, in Section 506 on modifications to the entries in Table 503 on building area per story. The proposal makes the necessary corrections. The overall result will be that an undefined term (i.e., area) is replaced by a defined term (i.e., building area).

In Section 202, the parenthetical reference "for masonry" is added to clarify that the definition for "area" is limited in application to the provisions of Chapter 21 on masonry construction. In Item #1 of Footnote (a) at Table 503, "height increase" is changed to "height and story increases" for consistency with Sections 504.2 and 506.3. In the notations at the bottom of Table 503, descriptions for "A" as the "building area per story" and "S" as "stories above grade plane" are added to clarify their application to the entries in Table 503.

Note that "area increase factor due to frontage" and "area increase factor due to sprinklers" in Sections 506.1 and 506.2 remain unchanged. These could be changed to "building area increase factors" but such changes are not crucial to this proposal that is, nevertheless, intended to be comprehensive. These "area increase factors" are unique to Section 506 and are terms for factors that modify building areas. They are not references to building areas.

A related proposal correlates building height in the same manner as this proposal for building area.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The proposal provided appropriate editorial clean up of “building area” throughout Chapter 5; essentially clarifying that the term “area” was referring to “building area.”

Assembly Action:

None

Final Hearing Results

G121-07/08

AS

Code Change No: **G122-07/08**

Original Proposal

Sections: 503, 503.1, 503.1.1, 503.1.2, 503.1.3, Table 503, 504.1, 504.2, 504.3, 508.4.3

Proponent: Philip Brazil, PE, Reid Middleton, Inc., representing himself

Revise as follows:

CHAPTER 5 (Supp)
GENERAL BUILDING HEIGHTS AND BUILDING AREAS

SECTION 503
GENERAL BUILDING HEIGHTS AND AREA LIMITATIONS

503.1 (Supp) General. The building height and area of a building shall not exceed the limits specified in Table 503 based on the type of construction as determined by Section 602 and the occupancies as determined by Section 302 except as modified hereafter. Each portion of a building separated by one or more fire walls complying with Section 705 shall be considered to be a separate building.

503.1.1 Special industrial occupancies. Buildings and structures designed to house special industrial processes that require large areas and unusual building heights to accommodate craneways or special machinery and equipment, including, among others, rolling mills; structural metal fabrication shops and foundries; or the production and distribution of electric, gas or steam power, shall be exempt from the building height and area limitations of Table 503.

503.1.2 Buildings on same lot. Two or more buildings on the same lot shall be regulated as separate buildings or shall be considered as portions of one building if the building height of each building and the aggregate area of buildings are within the limitations of Table 503 as modified by Sections 504 and 506. The provisions of this code applicable to the aggregate building shall be applicable to each building.

503.1.3 Type I construction. Buildings of Type I construction permitted to be of unlimited tabular building heights and areas are not subject to the special requirements that allow unlimited area buildings in Section 507 or unlimited building height in Sections 503.1.1 and 504.3 or increased building heights and areas for other types of construction.

TABLE 503
ALLOWABLE BUILDING HEIGHTS AND BUILDING AREAS^a
Building height limitations shown as stories and in feet above grade plane.
Story limitations shown as stories above grade plane.
Area limitations as determined by the definition of "Area, building", per story

Group	Hgt(feet)	TYPE OF CONSTRUCTION								
		TYPE I		TYPE II		TYPE III		TYPE IV	TYPE V	
		A	B	A	B	A	B	HT	A	B
	Hst Stories (S)	UL	160	65	55	65	55	65	50	40

(Portions of table not shown remain unchanged)

For SI: 1 foot = 304.8 mm, 1 square foot = 0.0929m².

UL = Unlimited, NP = Not permitted.

- a. See the following sections for general exceptions to Table 503:
 1. Section 504.2, Allowable building height increase due to automatic sprinkler system installation.
 2. Section 506.2, Allowable area increase due to street frontage.
 3. Section 506.3, Allowable area increase due to automatic sprinkler system installation.
 4. Section 507, Unlimited area buildings.
- b. For open parking structures, see Section 406.3.
- c. For private garages, see Section 406.1.
- d. See Section 415.5 for limitations.

SECTION 504 HEIGHT

504.1 General. The building height permitted by Table 503 shall be increased in accordance with this section.

Exception: The building height of one-story aircraft hangars, aircraft paint hangars and buildings used for the manufacturing of aircraft shall not be limited if the building is provided with an automatic fire-extinguishing system in accordance with Chapter 9 and is entirely surrounded by public ways or yards not less in width than one and one-half times ~~the height of the building~~ height.

504.2 (Supp) Automatic sprinkler system increase. Where a building is equipped throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.1, the value specified in Table 503 for maximum building height is increased by 20 feet (6096 mm) and the maximum number of stories is increased by one. These increases are permitted in addition to the area increase in accordance with Sections 506.2 and 506.3. For Group R buildings equipped throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.2, the value specified in Table 503 for maximum building height is increased by 20 feet (6096 mm) and the maximum number of stories is increased by one, but shall not exceed 60 feet (18 288 mm) or four stories, respectively.

Exceptions:

1. Buildings, or portions of buildings, classified as a Group I-2 occupancy of Type IIB, III, IV or V construction.
2. Buildings, or portions of buildings, classified as a Group H-1, H-2, H-3 or H-5 occupancy.
3. Fire-resistance rating substitution in accordance with Table 601, Note e.

504.3 Roof structures. Towers, spires, steeples and other roof structures shall be constructed of materials consistent with the required type of construction of the building except where other construction is permitted by Section 1509.2.1. Such structures shall not be used for habitation or storage. The structures shall be unlimited in height if of noncombustible materials and shall not extend more than 20 feet (6096 mm) above the allowable building height if of combustible materials (see Chapter 15 for additional requirements).

508.4.3 (Supp) Allowable height. Each separated occupancy shall comply with the building height limitations based on the type of construction of the building in accordance with Section 503.1.

Exception: Special provisions permitted by Section 509.

CODE CHANGES RESOURCE COLLECTION – INTERNATIONAL BUILDING CODE

Reason: “Building height” is defined in Section 502.1. “Height” is not defined in the IBC. Consequently, it has no technical meaning except to the extent that a technical meaning can be derived from the ordinarily accepted meaning of “height” (refer to Section 201.4). There are instances of “height” in Chapter 5, however, where “building height” is intended. The proposal makes the necessary corrections. The result will be that an undefined term (i.e., height) is replaced by a defined term (i.e., building height).

The title of Table 503 is changed by specifying the building height in feet above grade plane separately from the story limitations as stories above grade plane. This change eliminates the potentially confusing reference to story limitations in terms of height. The story limitations in Table 503 are based on the number of stories above grade plane, not their height “as stories” above grade plane.

The changes from “building areas” to “areas” in the title of Chapter 5 and from “area of a building” to “area” in Section 503.1 are intended as editorial and for consistency with the references to “building height and area limitations” and “building heights and areas” in Sections 503.1.1 and 503.1.3, respectively. A related proposal correlates building area in the same manner as this proposal for building height.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The proposal provided appropriate editorial clean up of “building height” throughout Chapter 5; essentially clarifying that the term “height” was referring to “building height.”

Assembly Action:

None

Final Hearing Results

G122-07/08

AS

Code Change No: G128-07/08

Original Proposal

Section: 505.1

Proponent: Lori Lee Graham, City of Portland, OR

Revise as follows:

505.1 General. A mezzanine or mezzanines in compliance with Section 505 shall be considered a portion of the story below in which it is contained. Such mezzanines shall not contribute to either the building area or number of stories as regulated by Section 503.1. The area of the mezzanine shall be included in determining the fire area defined in Section 702. The clear height above and below the mezzanine floor construction shall not be less than 7 feet (2134 mm).

Reason: In the 2003 IBC, this first sentence stated that a mezzanine was considered a “portion for the floor below”. As part of a series of editorial code changes addressing the use of “level” or ‘floor’, this section was changed from floor to story. One can now read that a mezzanine on the 3rd story is considered a portion of the 2nd story, the story below. Mezzanines are part of the story defined by the ceiling above the mezzanine and the floor below the mezzanine platform.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: This change clarifies which story within a building a mezzanine is associated.

Assembly Action:

None

Final Hearing Results

G128-07/08

AS

Code Change No: G129-07/08

Original Proposal

Section: 505.4

Proponent: William McErlane, City of Springdale, OH, representing the Ohio Building Officials Association

Revise as follows:

505.4 (Supp) Openness. A mezzanine shall be open and unobstructed to the room in which such mezzanine is located except for walls not more than 42 inches (1067 mm) high, columns and posts.

Exceptions:

1. Mezzanines or portions thereof are not required to be open to the room in which the mezzanines are located, provided that the occupant load of the aggregate area of the enclosed space does not exceed 10.
2. A mezzanine having two or more means of egress is not required to be open to the room in which the mezzanine is located if at least one of the means of egress provides direct access to an exit from the mezzanine level.
3. Mezzanines or portions thereof are not required to be open to the room in which the mezzanines are located, provided that the aggregate floor area of the enclosed space does not exceed 10 percent of the mezzanine area.
4. In industrial facilities, mezzanines used for control equipment are permitted to be glazed on all sides.
5. In occupancies other than Groups H and I, ~~occupancies that are~~ no more than two stories above grade plane and equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1, a mezzanine having two or more means of egress shall not be required to be open to the room in which the mezzanine is located.

Reason: Existing text is awkward. It confuses the user by appearing to refer to "...Groups H and I occupancies which are no more than two stories in height..." The proposed text clarifies the intent.

Cost Impact: The code change proposal will not increase the cost of construction

Public Hearing Results

Committee Action:**Approved as Submitted**

Committee Reason: The additional proposed language clarifies the intent of the exception.

Assembly Action:**None**

Final Hearing Results

G129-07/08**AS**

Code Change No: G130-07/08

Original Proposal

Section: 505.5

Proponent: Robert Bagnetto, Lapeyre Stair, Inc.

Revise as follows:

505.5 (Supp) Equipment platforms. Equipment platforms in buildings shall not be considered as a portion of the floor below. Such equipment platforms shall not contribute to either the building area or the number of stories as regulated by Section 503.1. The area of the equipment platform shall not be included in determining the fire area in accordance with Section 903. Equipment platforms shall not be a part of any mezzanine and such platforms and the walkways, stairs, alternating tread devices and ladders providing access to an equipment platform shall not serve as a part of the means of egress from the building.

Reason: The purpose of this proposed change to IBC-2006 is to allow the use of alternating tread devices as an access component to equipment platforms.

The proposed change is superior to the current provisions of the code in that it provides the option of using an additional type of access component to equipment platforms that is suitable for such application and that is not currently allowed by the code. IBC-2006 section 505.5 is overly restrictive in that it does not allow the use of alternating tread devices as an access component to equipment platforms, but does allow ladders for such use. (Or the intent of the section is to imply that other access components such as alternating tread devices are allowed but this is not clearly stated).

Alternating tread devices have been shown by the scientific study "Performance, perceived safety and comfort of the alternating tread stair" to be an acceptable vertical access component and preferred over ships' ladders. Alternating tread devices have been successfully used as an access component to equipment platforms for approximately 25 years. Alternating tread devices, by virtue of their features (i.e. 50 to 70° angle, larger tread size and size rails) are typically safer to use than vertical ladders and are suitable for the application specified in section 502. IBC-2006 currently allows use of alternating tread devices for accesses such as to mezzanines, boiler incinerator and furnace rooms, refrigeration machinery rooms, gallery gridirons and catwalks, unoccupied roofs, etc. Also, access to equipment platforms is a primary intended use for alternating tread devices, especially since they can be used such that tools can be carried up or down the device.

Alternating tread devices were patented in 1981 and their use to equipment platforms has been allowed by the Occupational Safety and Health Administration (OSHA) since December of 1981. Alternating tread devices were allowed as an access component to equipment platforms per The BOCA National Building Code/1999 and the 1997 Uniform Building Code, which were precursor codes to IBC. Alternating tread devices are also allowed to be used as an access component to equipment platforms under NFPA-101, 2006.

Bibliography:

- OSHA instruction STD 1-1.11, dated 4/26/82
- Letter dated 12/2/81 from Mark Cowan (OHSA) to Dale Ordoyne (Lapeyre Stair)
- Performance, perceived safety and comfort of the alternating tread stair* by Jorna, Mohageg & Synder, Virginia Polytechnic Institute and State University, published Applied Ergonomics 1989.20.1,26-32
- The BOCA National Building Code/1999, section 2805.2.5
- 1997 Uniform Building Code, section 1003.3.3.1
- Letter dated 10/20/87 from Tom Briggs (ICBO) to J. Robert Nelson (PFS Corp.)
- NFPA-101, 2006, section 7.2.11.1 (3)
- IBC-2006 sections 1009.1, 1015.3, 1015.4, 1015.6.1

Cost Impact: The code change proposal could minimally affect the cost of construction if alternating tread devices are used in lieu of ladders for access to equipment platforms.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: Allowing alternating tread devices where ladders are permitted is appropriate.

Assembly Action:

None

Final Hearing Results

G130-07/08

AS

Code Change No: G132-07/08

Original Proposal

Section: 506.2.1**Proponent:** John Berry, Cole + Russell Architects, Inc.**Revise as follows:**

506.2.1 (Supp) Width limits. The value of W shall be at least 20 feet (6096 mm). Where the value of W varies along the perimeter of the building, the calculation performed in accordance with Equation 5-2 shall be based on the weighted average of each portion of exterior wall and open space where the value of W is greater than or equal to 20 feet (6096 mm). Where the value of W exceeds 30 feet (9144 mm), a value of 30 feet (9144 mm) shall be used in calculating the weighted average, regardless of the actual width of the open space. Where two or more buildings are on the same lot, W shall be measured from the exterior face of a building to the exterior face of an opposing building, as applicable.

Exception: The value of W divided by 30 shall be permitted to be a maximum of 2 when the building meets all requirements of Section 507 except for compliance with the 60-foot (18 288 mm) public way or yard requirement, as applicable.

Reason: I have recently experienced some confusion from building officials on two separate projects that interpreted the determination of "W" on a multi-building development on the same property was determined by placing an imaginary line between the two buildings as one would do for the determination of fire separation distance for Table 602 and per the definition of Fire Separation Distance in Section 702. Per ICC staff, "For the measurement of "W", the major concern is the amount of open area between buildings. Because the buildings are on the same lot, the owner is in control of the space between buildings. W can be measured between buildings on the same lot."

Approval of this proposal will clarify this issue for all users of the code.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:**Approved as Submitted****Committee Reason:** The additional language clarifies how to measure W with two buildings on the same lot.**Assembly Action:****None**

Final Hearing Results

G132-07/08**AS**

Code Change No: G135-07/08

Original Proposal

Sections: 506.4, 506.4.1, 506.4.1.1, 506.5 (New), 506.5.1 (New), 506.5.2 (New)**Proponent:** Gene Boecker, Code Consultants, Inc. and Gregory R. Keith, Professional heuristic Development, representing the Boeing Company**1. Revise as follows:**

506.4 (Supp) Single occupancy buildings with more than one story. The total allowable building area of a single occupancy building with more than one story above grade plane shall be determined in accordance with this section. The actual aggregate building area at all stories in the building shall not exceed the total allowable building area.

Exception: A single basement need not be included in the total allowable building area, provided such basement does not exceed the area permitted for a building with no more than one story above grade plane.

506.4.1 (Supp) Area determination. The total allowable building area of a single occupancy building with more than one story above grade plane shall be determined by multiplying the allowable area per story (Aa), as determined in Section 506.1, by the number of stories above grade plane as listed below:

1. For buildings with two stories above grade plane, multiply by 2;
2. For buildings with three or more stories above grade plane, multiply by 3; and
3. No story shall exceed the allowable area per story (Aa), as determined in Section 506.1, for the occupancies on that story.

Exceptions:

1. Unlimited area buildings in accordance with Section 507.
2. The maximum area of a building equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.2 shall be determined by multiplying the allowable area per story (Aa), as determined in Section 506.1, by the number of stories above grade plane.

2. Delete as follows:

~~**506.4.1.1 (Supp) Mixed occupancies.** In buildings with mixed occupancies, the allowable area per story (Aa) shall be based on the most restrictive provisions for each occupancy when the mixed occupancies are treated according to Section 508.3.2. When the occupancies are treated according to Section 508.3.3 as separated occupancies, the maximum total building area shall be such that the sum of the ratios for each such area on all floors as calculated according to Section 508.3.3.2 shall not exceed 2 for two-story buildings and 3 for buildings three stories or higher.~~

3. Add new text as follows:

506.5 Mixed occupancy area determination. The total allowable building area for buildings containing mixed occupancies shall be determined in accordance with the applicable provisions of this section. A single basement need not be included in the total allowable building area, provided such basement does not exceed the area permitted for a building with no more than one story above grade plane.

506.5.1 No more than one story above grade plane. For buildings with no more than one story above grade plane and containing mixed occupancies, the total building area shall be determined in accordance with the applicable provisions of Section 508.1.

506.5.2 More than one story above grade plane. For buildings with more than one story above grade plane and containing mixed occupancies, each story shall individually comply with the applicable requirements of Section 508.1. For buildings with more than three stories above grade plane, the total building area shall be such that the aggregate sum of the ratios of the actual area of each story divided by the allowable area of such stories based on the applicable provisions of Section 508.1 shall not exceed three.

Reason: Mixed occupancy area determination procedures were first introduced into the 2006 IBC. Section 506.4.1.1 intends to prescribe multistory mixed occupancy provisions that were formerly not addressed in the IBC. Unfortunately, it tends to oversimplify what is necessarily a complicated process based on the recognition of numerous multistory, mixed occupancy design options. We submitted a modification to former Section 506.4.1 in Orlando that was approved as modified by the General Code Development Committee. That action was overturned by the membership in Rochester based on a public comment that the proposal was too wordy.

This simplified proposal integrates mixed occupancy provisions into the single occupancy, multistory requirements as revised by the 2007 Supplement. The key feature of this proposal is that it acknowledges all three of the mixed occupancy design options (accessory occupancies, nonseparated occupancies and separated occupancies) and maintains the rational sum of the ratio concept contained in the current provision. For one story, mixed occupancy buildings, proposed Section 506.5.1 defaults to Section 508.1 which prescribes allowable area determination procedures for each mixed occupancy contingency. For multistory buildings, Section 506.5.2 of the proposal still defaults to Section 508.1 which limits the allowable area of a given story based on the applicable design method. The current provision limits two-story buildings to an aggregate sum of the ratios of two and three for three or higher story buildings. This in fact is a moot point because if Section 508.1 individual story requirements are followed, the required ratios will never be exceeded.

For example, in a nonsprinklered, two-story, Type IIA building with 3,000 sf of Group B occupancy and 23,000 sf of Group S-1 occupancy on the first story and 2,000 sf of Group M and 24,000 sf of Group B occupancy on the second story, two mixed occupancy design options come into play. The first story qualifies for the nonseparated occupancy design method because the total square footage is equal to that permitted for the most restrictive, Group S-1 occupancy (26,000 sf). The second floor is larger than that permitted for a Group M occupancy; however, inasmuch as the Group M occupancy is less than 10% of the area of the second story, it qualifies as an accessory occupancy if subsidiary to the Group B occupancy. In this instance, each story individually qualifies based on the applicable mixed occupancy provision and therefore would always meet the current requirement that the sums of the ratios shall not exceed 2.0 in a two-story building. $(26,000 \div 26,000) + (26,000 \div 37,500) = 1.69 > 2.0$ OK. Obviously, if a third story were added the sum of the ratio calculation would be no more than 2.69 and satisfy the current 3.0 aggregate sum of the ratio requirement for a three-story building.

The aggregate sum of the ratio not to exceed three requirement does become appropriate for buildings of four or more stories in height. In the previous example, with only 0.31 credit remaining for a fourth story, it would appear that the building footprint would have to be reduced or the area of the fourth story reduced so as not to exceed the 3.0 maximum for buildings of more than three stories in height. For example: a

nonsprinklered, four story, Type IIA building with 3,000 sf of Group B occupancy and 17,000 sf of Group S-1 occupancy on the first story, 2,000 sf of Group M and 18,000 sf of Group B occupancy on the second story, 6,667 sf of Group B occupancy, 6,667 sf of Group M occupancy and 6,667 sf of Group F-1 occupancy on the third story and 2,000 sf of Group S-2 occupancy and 18,000 sf of Group S-1 occupancy on the fourth story. Story One: nonseparated occupancies -- $20,000 \div 26,000 = 0.77$. Story Two: accessory occupancies -- $20,000 \div 37,500 = 0.53$. Story Three: nonseparated occupancies -- $20,000 \div 21,500 = 0.93$. Story Four: accessory occupancies -- $20,000 \div 26,000 = 0.77$. Aggregate sum of the ratios: $0.77 + 0.53 + 0.93 + 0.77 = 3.0 \geq 3.0$ OK.

Similar to single occupancy, multistory buildings, these mixed occupancy, multistory provisions only apply to buildings not permitted to be of unlimited area. Unlike Section 506.4.1, it was felt that an exception referencing Section 507 was inappropriate as there is no Section 507 unlimited area provision would apply to a building four or more stories in height.

In summary, this proposal provides comprehensive requirements for the relatively common mixed occupancy, multistory design condition. Approval of this proposal will clarify current requirements and provide specific, but simple, guidance for the determination of total allowable building areas in multistory, mixed occupancy buildings that is currently lacking in the IBC.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: This code change appropriately addresses multistory mixed occupancy buildings. The code currently does not address this issue in detail.

Assembly Action:

None

Final Hearing Results

G135-07/08

AS

Code Change No: G142-07/08

Original Proposal

Section: 507.3

Proponent: Dave Ansell, Spotsylvania County Building Inspections, representing the Virginia Building and Code Officials Association

Revise as follows:

507.3 (Supp) Sprinklered, one story. The area of a Group B, F, M or S building no more than one-story above grade plane, or a Group A-4 building no more than one-story above grade plane, of other than Type V construction, shall not be limited when the building is provided with an automatic sprinkler system throughout in accordance with Section 903.3.1.1 and is surrounded and adjoined by public ways or yards not less than 60 feet (18 288 mm) in width.

Exceptions:

1. Buildings and structures of Type I and II construction for rack storage facilities that do not have access by the public shall not be limited in height, provided that such buildings conform to the requirements of Sections ~~507.2~~ 507.3 and, 903.3.1.1 and Chapter 23 of the IFC. NFPA 230.
2. The automatic sprinkler system shall not be required in areas occupied for indoor participant sports, such as tennis, skating, swimming and equestrian activities in occupancies in Group A-4, provided that:
 - 2.1. Exit doors directly to the outside are provided for occupants of the participant sports areas; and
 - 2.2. The building is equipped with a fire alarm system with manual fire alarm boxes installed in accordance with Section 907.
3. Group A-1 and A-2 occupancies of other than Type V construction shall be permitted, provided:
 - 3.1. All assembly occupancies are separated from other spaces as required for separated uses in Section 508.3.3.4 with no reduction allowed in the fire-resistance rating of the separation based upon the installation of an automatic sprinkler system;
 - 3.2. Each Group A occupancy shall not exceed the maximum allowable area permitted in Section 503.1; and
 - 3.3. All required exits shall discharge directly to the exterior.

CODE CHANGES RESOURCE COLLECTION – INTERNATIONAL BUILDING CODE

Reason: This change is considered editorial and corrects an erroneous reference to 507.2. This language was contained in the BOCA legacy code and provides a height exception for unlimited area rack storage facilities. These rack storage facilities were allowed to contain combustible storage and be classified as an S-1 or F-1. As currently written the facility would be limited to F-2 or S-2 occupancies.

Additionally this change revises the reference to NFPA 230 to Chapter 23 of the IFC. This is related to the fact that NFPA 230 will no longer be published by NFPA and the type of information contained in NFPA 230 is essentially what is found in Chapter 23 of the IFC dealing with high-piled storage.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The proposal appropriately references the correct Section 507.3 which is for sprinklered buildings versus Section 507.2 which is for nonsprinklered buildings. The proposal also appropriately revises the reference from an outdated standard NFPA 230 to Chapter 23 of the IFC which contains the intended requirements.

Assembly Action:

None

Final Hearing Results

G142-07/08

AS

Code Change No: G144-07/08

Original Proposal

Section: 507.3

Proponent: Dave Collins, AIA, The Preview Group, Inc., representing the AIA Codes Committee

Revise as follows:

507.3 (Supp) Sprinklered, one story. The area of a Group B, F, M or S building no more than one-story above grade plane, or a Group A-4 building no more than one-story above grade plane, of other than Type V construction, shall not be limited when the building is provided with an automatic sprinkler system throughout in accordance with Section 903.3.1.1 and is surrounded and adjoined by public ways or yards not less than 60 feet (18 288 mm) in width.

Exceptions:

1. Buildings and structures of Type I and II construction for rack storage facilities that do not have access by the public shall not be limited in height, provided that such buildings conform to the requirements of Sections 507.2 and 903.3.1.1 and NFPA 230.
2. The automatic sprinkler system shall not be required in areas occupied for indoor participant sports, such as tennis, skating, swimming and equestrian activities in occupancies in Group A-4, provided that:
 - 2.1. Exit doors directly to the outside are provided for occupants of the participant sports areas; and
 - 2.2. The building is equipped with a fire alarm system with manual fire alarm boxes installed in accordance with Section 907.

507.3.1 Mixed occupancy buildings with Group A-1 and A-2. ~~3.~~ Group A-1 and A-2 occupancies of other than Type V construction shall be permitted within mixed occupancy buildings of unlimited area complying with Section 507.3, provided:

- ~~3.1.~~ All assembly 1. Group A-1 and A-2 occupancies are separated from other spaces occupancies as required for separated occupancies in Section 508.3.3.4 with no reduction allowed in the fire-resistance rating of the separation based upon the installation of an automatic sprinkler system;

~~3.2. Each Group A occupancy 2. The area of the portions of the building used for Group A-1 or Group A-2 occupancies shall not exceed the maximum allowable area permitted for such occupancies in Section 503.1; and~~

~~3.3.3. All required exits exit doors from Group A-1 and A-2 occupancies shall discharge directly to the exterior of the building.~~

Reason: **Exception #3** was added to Section 507.3 for the 2006 IBC by Code Change No. G124-04/05. The intent of the change was to allow A1 and A2 occupancies in one story buildings of unlimited area, but not as stand alone buildings. Part of the rationale for the change was that such occupancies are allowed in the mix of uses in a covered mall building. The intent of this proposal is to clarify the intent of the original proposal as approved by the membership. This proposal moves the section from being an exception to 507.3 to being a related subsection 507.3.1. The reason for this organizational change is because the charging sentences of 507.3 never mention the A-1 and A-2 occupancies, and it is hard for the code user to understand that the exception adds occupancies. The first sentence of the new 507.3.1 is revised to make sure that such buildings comply with all the provisions of 507.3, not just that it can't be in a Type V building. Item 1 (former item 3.1) is revised so that it only applies to the A-1 and A-2 occupancies that this provision is intended to address rather than applying also to an A-4 occupancy which might be in a mixed occupancy building. Item 2 (former item 3.2) is revised similarly to Item 1 so that it is limiting the area of the A-1 and A-2 and not the A-4. Item 3 (former Item 3.3) is revised to clarify that it is the exit doors from the A-1 and A-2 occupancies and not all the exit doors throughout the building.

Cost Impact: This is simply editorial and has no cost impact.

Public Hearing Results

Committee Action:

Approved as Modified

Modify the proposal as follows;

507.3.1 Mixed occupancy buildings with Group A-1 and A-2. Group A-1 and A-2 occupancies of other than Type V construction shall be permitted within mixed occupancy buildings of unlimited area complying with Section 507.3, provided:

1. Group A-1 and A-2 occupancies are separated from other occupancies as required for separated occupancies in Section 508.3.3.4 with no reduction allowed in the fire-resistance rating of the separation based upon the installation of an automatic sprinkler system;
2. ~~Each the~~ area of the portions of the building used for Group A-1 or Group A-2 occupancies shall not exceed the maximum allowable area permitted for such occupancies in Section 503.1; and
3. All exit doors from Group A-1 and A-2 occupancies shall discharge directly to the exterior of the building.

(Portions of proposal not shown remain unchanged)

Committee Reason: The proposal clarifies a complicated exception that is specifically allowing Group A1 and A2 occupancies of a limited size in an unlimited area building. The first modification was to clarify that the type of construction excludes Type V. The second modification was a clarification that each occupancy is looked at on its own and not as an aggregate.

Assembly Action:

None

Final Hearing Results

G144-07/08

AM

Code Change No: **G146-07/08**

Original Proposal

Section: 507.5

Proponent: Philip Brazil, PE, Reid Middleton, Inc., representing himself

Revise as follows:

507.5 Reduced open space. The ~~permanent open space~~ public ways or yards of 60 feet (18 288 mm) in width required in Sections 507.2, 507.3, 507.4, 507.6 and 507.10 shall be permitted to be reduced to not less than 40 feet (12 192 mm); in width provided the following requirements are met:

CODE CHANGES RESOURCE COLLECTION – INTERNATIONAL BUILDING CODE

1. The reduced ~~open space~~ width shall not be allowed for more than 75 percent of the perimeter of the building.
2. The exterior walls facing the reduced ~~open space~~ width shall have a minimum fire-resistance rating of 3 hours.
3. Openings in the exterior walls facing the reduced ~~open space~~ width shall have opening protectives with a minimum fire protection rating of 3 hours.

Reason: The changes are proposed for consistency with the code sections referenced in Section 507.5 none of which specify permanent open space but all specify public ways or yards.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The proposal provides consistency with terms used throughout the code.

Assembly Action:

None

Final Hearing Results

G146-07/08

AS

Code Change No: G147-07/08

Original Proposal

Sections: 507.6, 507.7 (New)

Proponent: Wayne R. Jewell, CBO, City of Southfield, MI

Revise as follows:

507.6 (Supp) Group A-3 buildings Type II Construction. The area of a Group A-3 building no more than one-story above grade plane, used as a place of religious worship, community hall, dance hall, exhibition hall, gymnasium, lecture hall, indoor swimming pool or tennis court of Type II construction shall not be limited when all of the following criteria are met:

1. The building shall not have a stage other than a platform.
2. The building shall be equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.
- ~~3. The assembly floor shall be located at or within 21 inches (533 mm) of street or grade level and all exits are provided with ramps complying with Section 1010.1 to the street or grade level.~~
- 4-3. The building shall be surrounded and adjoined by public ways or yards not less than 60 feet (18 288 mm) in width.

507.7 Group A-3 buildings Type III and IV Construction. The area of a Group A-3 building no more than one-story above grade plane, used as a place of religious worship, community hall, dance hall, exhibition hall, gymnasium, lecture hall, indoor swimming pool or tennis court of Type III or IV construction shall not be limited when all of the following criteria are met:

1. The building shall not have a stage other than a platform.
2. The building shall be equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.
3. The assembly floor shall be located at or within 21 inches (533 mm) of street or grade level and all exits are provided with ramps complying with Section 1010.1 to the street or grade level.
4. The building shall be surrounded and adjoined by public ways or yards not less than 60 feet (18 288 mm) in width.

(Renumber subsequent sections)

Reason: Section 507.6 was added into the IBC by code change G104-00, which had a supporting statement that cited one story buildings of Group A-3 were permitted in two legacy codes. While two of the three legacy codes did permit one story unlimited area buildings of Group A-3, the language that was proposed, modified and approved by the membership did not completely reflect the scope of what was permitted in the previous codes.

Those previously permitted unlimited area buildings were not:

1. Limited to just Type II construction by either code.
2. Not all A-3 Uses were subject to the provision of having the assembly floor within 21 inches (533mm) of street or grade level.
 - a. Provision to limit the elevation of assembly floors was not applied to any Group A-3 Uses in one of the codes.
 - b. Wasn't applied to sport facility type uses without spectator seating in the other code.

What has occurred in adding this language is to group a selection of A-3 Uses together that were not identified in either of the legacy codes. What was limited to having an assembly floor within 21" of street or grade level within the Standard Building Code was all Group A buildings without a stage requiring proscenium opening protection of Type V 1-hour, IV or III construction. The types of construction in the Standard building Code were different from those we now use Type IV is what is now known as Type IIB. Another Section in the Standard Building Code addressed large and small Group A occupancies with and without stages requiring proscenium protection. What has been done is to narrow the scope of what was permitted in both legacy codes by listing selected uses. This language further prohibits uses that are less of a risk to persons than others permitted to be two stories and unlimited in area such as Group M. What is current language ignored what was permitted; having a building containing participant sports from being unlimited in area. G104-00 allowed some of what was missing from the IBC, but increased the limitations than previously were required. Also it greatly impacted all A-3 Uses for the other code of origin.

I have no concern with the added limitation for Types of Construction that current language requires that didn't previously, but to not allow a mezzanine or raised floor surface beyond 21 inches for the uses such as a running track or location to have tread mills, aerobic cycles or dance studios or business offices is very restrictive. More restrictive than either of the codes of origin and is more restrictive than the source of the original language and what was the expressed intent of the original proposal.

Elimination of the 21 inch floor elevation limit for Type II construction and retaining it for Types III and IV which more closely reflects a compromise of the provisions of both legacy codes. While retaining the restriction for types of construction that permit combustible materials.

If we want to restrict unlimited area buildings used as a place of worship or lecture hall to the floor level elevation limit of 21 inches (533 mm), I guess that we have done. Such a restriction eliminates all balconies and reduces or limits the slope of a floor to improve sight lines to a platform or stage. It certainly limits the height of raised areas in an exhibition hall; even those completely accessed by ramps.

This is one of two code change proposals accomplishing essentially the same end goal. The first proposal is preferred but represents a larger shift from current code text. Therefore the second option G148-07/08 is offered as an alternative.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The proposal was approved based upon proponent's reason; which is to allow balconies in one story unlimited area Group A-3 buildings of Type II construction. The new section provides the same requirements for unlimited area Group A-3 buildings for Type III and IV construction with the additional limitation on the height of the assembly floor.

Assembly Action:

None

Final Hearing Results

G147-07/08

AS

Code Change No: **G150-07/08**

Original Proposal

Section: 507.8

Proponent: Philip Brazil, PE, Reid Middleton, Inc., representing himself

Revise as follows:

507.8 (Supp) Aircraft paint hangar. The area of a Group H-2 aircraft paint hangar no more than one-story above grade plane, shall not be limited where such aircraft paint hangar complies with the provisions of Section 412.4 and is ~~entirely~~ surrounded and adjoined by public ways or yards not less in width than one and one-half times the height of the building.

Reason: The changes are proposed for consistency with identical language in Sections 507.2, 507.3, 507.4, 507.6 (Item 4), 507.9 (Item 3) and 507.10.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The proposal clarifies the language for unlimited area aircraft paint hangars. The term “entirely” was difficult to understand.

Assembly Action:

None

Final Hearing Results

G150-07/08

AS

Code Change No: G153-07/08

Original Proposal

Table 508.2.5

Proponent: Rob Geislinger, Parker Fire District, CO, representing the Fire Marshals Association of Colorado (FMAC)

Revise table as follows:

**TABLE 508.2.5 (Supp)
INCIDENTAL ACCESSORY OCCUPANCIES**

ROOM OR AREA	SEPARATION AND/OR PROTECTION
Stationary storage battery systems having a liquid electrolyte capacity of more than 100 gallons, or a lithium-ion capacity of 1,000 pounds (454 Kg) used for facility standby power, emergency power or uninterrupted power supplies	1-hour in Group B, F, M, S and U occupancies. 2-hour in Group A, E, I and R occupancies

(Portions of table and footnotes not shown remain unchanged)

Reason: This change is necessary to complete the correlation between the IBC and IFC begun in G149. This change recognized that modern storage battery systems rely upon electrolytes other than typical lead-acid systems. The proposed language recognizes that lithium-ion batteries are measured by weight and not by volume.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The proposed revision correlates stationary storage battery systems appropriately with the IFC.

Assembly Action:

None

Final Hearing Results

G153-07/08

AS

Code Change No: **G154-07/08**

Original Proposal

Table 508.2.5

Proponent: Rob Geislinger, Parker Fire District, CO, representing the Fire Marshals Association of Colorado (FMAC)

Revise table as follows:

**TABLE 508.2.5 (Supp)
INCIDENTAL ACCESSORY OCCUPANCIES**

ROOM OR AREA	SEPARATION AND/OR PROTECTION
Stationary storage battery systems having a liquid capacity of more than 100 50 gallons used for facility standby power, emergency power or uninterrupted power supplies	1-hour in Group B, F, M, S and U occupancies. 2-hour in Group A, E, I and R occupancies

(Portions of table and footnotes not shown remain unchanged)

Reason: This change attempts to correlate the IBC and IFC. The provisions in IFC Section 608 apply to battery systems containing more than 50 gallons. This limit has existed since the 2000 edition of that Code. Without this change there are two thresholds for battery room provisions, one at 50 gallons (found in the IFC) and the second at 100 gallons (found in the IBC). Providing only one threshold will simplify enforcement.

Cost Impact: This will increase cost for battery system installations containing between 50 and 100 gallons of electrolyte.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The proposed revision correlates stationary storage battery systems appropriately with the IFC.

Assembly Action:

None

Final Hearing Results

G154-07/08

AS

Code Change No: **G155-07/08**

Original Proposal

Table 508.2.5

Proponent: Greg Johnson, City of Saint Paul, MN

Revise table as follows:

**TABLE 508.2.5 (Supp)
INCIDENTAL ACCESSORY OCCUPANCIES**

ROOM OR AREA	SEPARATION AND/OR PROTECTION
Rooms containing fire pumps	2 hours; or 1 hour and provide automatic fire extinguishing system

(Portions of table and footnotes not shown remain unchanged)

CODE CHANGES RESOURCE COLLECTION – INTERNATIONAL BUILDING CODE

Reason: The proposal correlates fire pump room construction requirements that already exist through the reference to NFPA 20 in IFC Section 913.2. The addition of this language in the IBC clarifies that a separation requirement exists for fire pump rooms and improves the ease of use of the document.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The proposed requirements need to be correlated with NFPA 20 before such provisions can be placed within Table 508.2.5.

Assembly Action:

None

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Greg Johnson, representing the City of Saint Paul, MN and Wayne R. Jewell, CBO, City of Southfield, representing himself request Approval as Modified by this public comment.

Modify proposal as follows:

**TABLE 508.2.5 (Supp)
INCIDENTAL ACCESSORY OCCUPANCIES**

ROOM OR AREA	SEPARATION AND/OR PROTECTION
Rooms <u>in non-high-rise buildings</u> containing fire pumps	2 hours; or 1 hour and provide automatic fire extinguishing system <u>throughout the building.</u>
Rooms in high-rise buildings containing fire pumps	2 hours

508.2.5.3 Protection (Supp). Except as specified in Table 508.2.5 for certain incidental accessory occupancies, where an automatic fire-extinguishing system or an automatic sprinkler system is provided in accordance with Table 508.2.5, only the space occupied by the incidental accessory occupancy need be equipped with such system.

Commenter's Reason: The intent of the original proposal was to bring to the attention of the user of the International Building Code that fire pump rooms in NFPA 20 are required to be separated out from the remainder of the building by fire barriers like other incidental accessory use areas. NFPA 20 is referenced in Section 913.2 of the International Fire Code. However it was pointed out in the code hearings in Palm Springs that NFPA 20 does not permit a reduction in the fire resistance of the separation barrier in high-rise buildings that are provided with sprinkler protection. And a further review of NFPA 20 indicates that the reduction to 1 hour is only allowed in a fully sprinklered building. This public comment revises the requirements for fire pump rooms so any reduction in the fire resistance ratings of the fire barrier for sprinklers is consistent with the requirements in NFPA 20, referenced in the IFC. Since the code now only requires the sprinkler protection within the incidental accessory areas, per Section 508.2.5.3 (2007 Supplement), we have proposed an additional change to this section to coordinate with the proposed change in the table.

Final Hearing Results

G155-07/08

AMPC

Code Change No: **G156-07/08**

Original Proposal

Sections: 508.2.5.1, 706.5

Proponent: William Clayton, City of Westminster, CO, representing himself

THESE PROPOSALS ARE ON THE AGENDA OF THE IBC GENERAL AND IBC FIRE SAFETY CODE DEVELOPMENT COMMITTEES AS 2 SEPARATE CODE CHANGES. SEE THE TENTATIVE HEARING ORDER FOR THESE COMMITTEES.

PART I – IBC GENERAL

Revise as follows:

508.2.5.1 (Supp) Fire-resistance rated separation. Where Table 508.2.5 specifies a fire-resistance rated separation, the incidental accessory occupancies shall be separated from the remainder of the building by a fire barrier constructed in accordance with Section 706 or a horizontal assembly constructed in accordance with Section 711, or both. Construction supporting one-hour fire-resistance-rated fire barriers or horizontal assemblies used for incidental accessory occupancy separations in buildings of Type IIB, IIIB, and VB construction are not required to be fire-resistance-rated unless required by other sections of this code.

PART II – IBC FIRE SAFETY

Revise as follows:

706.5 (Supp) Continuity. Fire barriers shall extend from the top of the floor/ceiling assembly below to the underside of the floor or roof sheathing, slab or deck above and shall be securely attached thereto. Such fire barriers shall be continuous through concealed spaces, such as the space above a suspended ceiling. The supporting construction for a fire barrier shall be protected to afford the required fire-resistance rating of the fire barrier supported, ~~except for 1-hour fire barriers required by Table 508.2 in buildings of Type IIB, IIIB and VB construction.~~ Hollow vertical spaces within a fire barrier shall be fireblocked in accordance with Section 717.2 at every floor level.

Exceptions:

1. The maximum required fire-resistance rating for assemblies supporting fire barriers separating tank storage as provided for in Section 415.6.2.1 shall be 2 hours, but not less than required by Table 601 for the building construction type.
2. Shaft enclosures shall be permitted to terminate at a top enclosure complying with Section 707.12.
3. Construction supporting one-hour fire-resistance-rated fire barriers used for incidental accessory occupancy separations as required by Table 508.2.5 in buildings of Type IIB, IIIB, and VB construction are not required to be fire-resistance-rated unless required by other sections of this code.

Reason: Section 508.2.5.1 sends the reader to sections 706 and 711 for the specific requirements for the fire-resistance rated fire-barrier and horizontal assemblies. When reading sections 706.5 it is not clear that the floor supporting the incidental use area walls is not required to be fire-resistance rated. Within our own group of code officials, design professionals, and plans examiners, we have had lively discussions revolving around this requirement. By placing this new wording in section 508.2.5.1 and revising Section 706.5, the intent and meaning is clear and we relieve any confusion. Section 706.5 currently does not read clearly and it includes an exception within the body of the code. I have removed the exception from the body and added it as the 3rd exception. By submitting this change I have eliminated any possible discrepancy. Both code changes mirror each other in wording and intent.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

PART I – IBC GENERAL

Committee Action:

Approval as Submitted

Committee Reason: This code change clarifies that the supporting fire resistive construction for fire barriers and horizontal assemblies separating incidental accessory occupancies is not required for Types IIB, IIIB and VB construction.

Assembly Action:

None

PART II – IBC FIRE SAFETY

Committee Action:

Approved as Submitted

Committee Reason: The committee agreed that this proposal clarifies the current code requirements by separating the requirements for the continuity of the vertical fire barrier from the allowance for the fire resistance ratings of the supporting construction relating to Type IIB, IIIB, and VB construction that does not require continuity of the fire resistive rating when supporting separations for incidental accessory occupancies.

Assembly Action:

None

Final Hearing Results

G156-07/08, Part I	AS
G156-07/08, Part II	AS

Code Change No: G157-07/08

Original Proposal

Section: 508.2.5.2

Proponent: William Clayton, City of Westminster, CO, representing himself

Revise as follows:

508.2.5.2 (Supp) Nonfire-resistance rated separation and protection. Where Table 508.2.5 permits an automatic fire extinguishing system without a fire barrier, the incidental accessory occupancies shall be separated from the remainder of the building by construction capable of resisting the passage of smoke. The walls shall extend from the top of the foundation or floor/ceiling assembly below to the underside of the fire-resistance-rated floor/ceiling assembly above or fire-resistance-rated roof/ceiling assembly above or to the underside of the floor or roof sheathing, deck or slab above. Doors shall be self- or automatic closing upon detection of smoke in accordance with Section 715.4.7.3- and shall not be undercut in excess of the clearance permitted in accordance with NFPA 80. Walls surrounding the incidental accessory occupancy shall not have air transfer openings unless provided with smoke dampers in accordance with Section 710.7. ~~Doors shall not have air transfer openings and shall not be undercut in excess of the clearance permitted in accordance with NFPA 80.~~

Reason: Currently Section 508.2.5.1 prohibits air transfer openings to be installed in the door to an incidental use area. The code is silent regarding the protection of the wall when the incidental use area wall is allowed to be constructed to resist the passage of smoke rather than be constructed as a one-hour fire-resistance-rated assembly. Without adding this language, the wall could effectively have unlimited air transfer openings while the door is regulated to prohibit air transfer openings. As a Building Plans Examiner, I see this situation presented frequently. Currently the building designer and code official are left with no guidance as to the requirements. By adding the necessary language above, we can clarify the code and correct this over-sight. The addition of this language would define the level of protection needed to allow penetrations of the wall that separates an incidental use area from other portions of the building. Section 710.7 currently provides the charging statement to require dampers in similar smoke partitions. The exact specifications are then given in 716.3 as referenced in section 710.7. This is a logical path and uses language that already exists in the code for similar assemblies.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Modified

Modify the proposal as follows:

508.2.5.2 (Supp) Nonfire-resistance rated separation and protection. Where Table 508.2.5 permits an automatic fire extinguishing system without a fire barrier, the incidental accessory occupancies shall be separated from the remainder of the building by construction capable of resisting the passage of smoke. The walls shall extend from the top of the foundation or floor/ceiling assembly below to the underside of the fire-resistance-rated floor/ceiling assembly above or fire-resistance-rated roof/ceiling assembly above or to the underside of the floor or roof sheathing, deck or slab above. Doors shall be self- or automatic closing upon detection of smoke in accordance with Section 715.4.7.3. ~~and shall~~

~~not be undercut in excess of the clearance permitted in accordance with NFPA 80. Walls surrounding the incidental accessory occupancy shall not have air transfer openings unless provided with smoke dampers in accordance with Section 710.7. Doors shall not have air transfer openings and shall not be undercut in excess of the clearance permitted in accordance with NFPA 80. Walls surrounding the incidental accessory occupancy shall not have air transfer openings unless provided with smoke dampers in accordance with Section 710.7.~~

Committee Reason: Currently Section 508.2.5.1 prohibits air transfer openings to be installed in the door to an incidental use area. The code is silent regarding the protection of the wall when the incidental use area wall is allowed to be constructed to resist the passage of smoke rather than be constructed as a one-hour fire-resistance-rated assembly. Without adding this language, the wall could effectively have unlimited air transfer openings while the door is regulated to prohibit air transfer openings. Currently the building designer and code official are left with no guidance as to the requirements. The addition of this language would define the level of protection needed to allow penetrations of the wall that separates an incidental use area from other portions of the building. Section 710.7 currently provides the charging statement to require dampers in similar smoke partitions. The exact specifications are then given in Section 716.3 as referenced in Section 710.7. This is a logical path and uses language that already exists in the code for similar assemblies. The modification to the proposal simply addresses a better layout of the language proposed.

Assembly Action:

None

Final Hearing Results

G157-07/08

AM

Code Change No: G160-07/08

Original Proposal

Table 508.4

Proponent: Tom Lariviere, Fire Department, Madison, MS, representing the Joint Fire Service Review Committee

Revise table as follows:

**TABLE 508.4 (Supp)
REQUIRED SEPARATION OF OCCUPANCIES (HOURS)**

OCCUPANCY	A ^d , E		I-1, I-3, I-4		I-2		R ^c		F-2, S-2 ^{b,d} , U ^d		B, F-1, M, S-1		H-1		H-2		H-3, H-4, H-5	
	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS
A ^d , E ^d	N	N	1	2	2	2	1	2	N	1	1	2	NP	NP	3	4	2	3 ^a
I-1, I-3, I-4	—	—	N	N	2	2	1	NP	1	2	1	2	NP	NP	3	NP	2	NP
I-2	—	—	—	—	N	N	2	NP	2	2	2	2	NP	NP	3	NP	2	NP
R ^c	—	—	—	—	—	—	N	N	1	2	1	2	NP	NP	3	NP	2	NP
F-2, S-2 ^{b,c} U ^c	—	—	—	—	—	—	—	—	N	N	1	2	NP	NP	3	4	2	3 ^a
B, F-1, M, S-1	—	—	—	—	—	—	—	—	—	—	N	N	NP	NP	2	3	1	2 ^a
H-1	—	—	—	—	—	—	—	—	—	—	—	—	N	NP	NP	NP	NP	NP
H-2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	N	NP	1	NP
H-3, H-4, H-5	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	N	NP

For SI: 1 square foot = 0.0929 m².

S = Buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1.

NS = Buildings not equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1.

N = No separation requirement.

NP = Not permitted.

CODE CHANGES RESOURCE COLLECTION – INTERNATIONAL BUILDING CODE

- a. For Group H-5 occupancies, see Section 903.2.4.2.
- b. Areas used only for private or pleasure vehicles shall be allowed to reduce separation by 1 hour.
- c. See Section 406.1.4.
- d. Commercial kitchens need not be separated from the restaurant seating areas that they serve.

Reason: This proposal will require Group I-2 occupancies to be separated by at least a two hour separation from the remainder of the building. Group I-2 occupancies contain patients who need assistance during evacuation and thus require longer evacuation time. The separation of a minimum of 2 hours will provide for horizontal movement and then vertical movement/evacuation if needed.
 This provision will provide consistency in the IBC with Federal Regulations for these facilities.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: Group I-2 occupancies already have smoke compartment requirements in Section 407 therefore the separation requirements currently in Table 508.4 were considered adequate.

Assembly Action:

None

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Tom Lariviere, Fire Department, Madison, MS, representing the Joint Fire Service Review Committee, requests Approval as Modified by this public comment.

Modify proposal as follows:

**TABLE 508.4 (Supp)
 REQUIRED SEPARATION OF OCCUPANCIES (HOURS)**

Occupancy	A ^e , E		I-1, I-3, I-4		I-2		R ^d		F-2, S-2 ^{c,d} , U ^d		B ^b , F-1, M ^b , S-1		H-1		H-2		H-3, H-4, H-5	
	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS
A ^e , E ^e	N	N	1	2	2	$\frac{2}{NP}$	1	2	N	1	1	2	NP	NP	3	4	2	3 ^a
I-1, I-3, I-4	—	—	N	N	2	$\frac{2}{NP}$	1	NP	1	2	1	2	NP	NP	3	NP	2	NP
I-2	—	—	—	—	N	N	2	NP	2	$\frac{2}{NP}$	2	$\frac{2}{NP}$	NP	NP	3	NP	2	NP
R ^d	—	—	—	—	—	—	N	N	1	2	1	2	NP	NP	3	NP	2	NP
F-2, S-2 ^{c,d} , U ^d	—	—	—	—	—	—	—	—	N	N	1	2	NP	NP	3	4	2	3 ^a
B ^b , F-1, M ^b , S-1	—	—	—	—	—	—	—	—	—	—	N	N	NP	NP	2	3	1	2 ^a
H-1	—	—	—	—	—	—	—	—	—	—	—	—	N	NP	NP	NP	NP	NP
H-2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	N	NP	1	NP
H-3, H-4, H-5	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	N	NP

For SI: 1 square foot = 0.0929 m².

S = Buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1.

NS = Buildings not equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1.

N = No separation requirement.

NP = Not permitted.

- a. For Group H-5 occupancies, see Section 903.2.4.2.
- b. Areas used only for private or pleasure vehicles shall be allowed to reduce separation by 1 hour.
- c. See Section 406.1.4.
- d. Commercial kitchens need not be separated from the restaurant seating areas that they serve.

Commenter's Reason: This Public Comment requires that I-2 occupancies be separated from other occupancies by at least 2-HR fire resistive construction. The Code Development Committee disapproved this original proposal. The reason was that the smoke compartments exist in I-2 occupancies therefore this change is not necessary.

However, even with the smoke compartments, this proposal will specify that Group I-2 occupancies need to be separated by at least a two hour separation from other occupancies. Group I-2 occupancies contain patients who need assistance during evacuation and thus require longer evacuation time. The separation of a minimum of 2 hours will provide for horizontal movement and then vertical movement/evacuation if needed.

Four entries in the Table are revised from 2-HR to NP for separations between I-2 and other occupancies. This is consistent with Section 903.2.5 which requires that the entire building must be sprinklered when it contains a I occupancy. Therefore, a non-sprinklered situation could not exist for new construction.

This provision will provide consistency and correlation of the IBC with mandated Federal Regulations for these facilities. In other words, the Federal Regulations already require this separation. Without the inclusion of this information in the IBC, a new facility could be constructed and completed only to find out that they need to go back and install a 2 hour fire separation. If the IBC contains this requirement, it will eliminate confusion and frustration on the part of the owner/developer and eliminate finger pointing after the code official has "approved" the facility.

Final Hearing Results

G160-07/08

AMPC

Code Change No: G161-07/08

Original Proposal

Table 508.4

Proponent: Larry Fluor, Larry Fluor, Inc., representing the Compressed Gas Association

Revise table as follows:

**TABLE 508.4 (Supp)
REQUIRED SEPARATION OF OCCUPANCIES (HOURS)**

OCCUPANCY	A ^d , E		I		R ^c		F-2, S-2 ^{b,c} , U ^c		B, F-1, M, S-1		H-1		H-2		H-3, H-4, H-5	
	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS
A ^d , E ^d	N	N	1	2	1	2	N	1	1	2	NP	NP	3	4	2	3 ^a
I	--	--	N	N	1	NP	1	2	1	2	NP	NP	3	NP	2	NP
R ^c	--	--	--	--	N	N	1	2	1	2	NP	NP	3	NP	2	NP
F-2, S-2 ^{b,c} , U ^d	--	--	--	--	--	--	N	N	1	2	NP	NP	3	4	2	3 ^a
B, F-1, M, S-1	--	--	--	--	--	--	--	--	N	N	NP	NP	2	3	1	2 ^a
H-1	--	--	--	--	--	--	--	--	--	--	N	NP	NP	NP	NP	NP
H-2	--	--	--	--	--	--	--	--	--	--	--	--	N	NP	1	NP
H-3, H-4, H-5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1 ^{e,f} N	NP

For SI: 1 square foot = 0.0929 m².

S = Buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1.

NS = Buildings not equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1.

N = No separation requirement.

NP = Not permitted.

a. For Group H-5 occupancies, see Section 903.2.4.2.

b. Areas used only for private or pleasure vehicles shall be allowed to reduce separation by 1 hour.

c. See Section 406.1.4.

d. Commercial kitchens need not be separated from the restaurant seating areas that they serve.

e. Separation is not required between occupancies of the same classification.

f. For H-5 occupancies see Section 415.8.2.2.

Reason: There were a number of proposals made in the 2006/2007 code cycle to extensively revise Table 508.3.3. Several of the code changes have proposed completely rewriting the table to return it to a point that resembles the legacy code approach. The ICC membership appears to have accepted the current format for the table. There has been testimony offered by proponents of the table that have asked those with specific concerns to bring the concerns forward for resolution.

The Compressed Gas Association has voiced opposition to changes in the table that have been proposed subsequent to the current revised state that markedly increase requirements for separation that appear to be inconsistent with established practice. The Compressed Gas industry and its customer base routinely occupy buildings of mixed occupancy where gas storage rooms are constructed as a means to isolate materials determined to be mutually incompatible, and where occupancy separation provides a means to do so.

The legacy codes traditionally have required a one-hour separation between occupancies of H-3, H-4 and H-5 as a means to isolate physical hazard materials from those that present a health hazard. The H-5 occupancy (semiconductor manufacturing) utilizes a wide variety of compressed gases as well as a variety of other hazardous materials liquids and solids and one of the basic tenets of control has been the use of a minimum one-hour separation between the H-5 area and the hazardous materials storage rooms which are used to support the activity in the fabrication area.

Other industries that utilize the wide variety of hazardous materials indicated in IBC Sections 307.5 and 307.6 routinely separate these materials one from the other through the use of an occupancy separation. Examples of Section 307.5 materials include flammable and combustible liquids, oxidizers, flammable solids, and unstable reactives.

Health hazard materials, e.g., toxics and corrosives (H-4), especially those in storage, are normally separated from physical hazard materials (H-3) as a means to protect against exposure fires. Where these materials are required to be used in a process where incompatibles with a physical hazard are involved, the incompatible materials are required to be separated, and the more restrictive provisions governing construction are applied.

The requirements for the H-5 occupancy were established in the Uniform Codes in 1984, and the provisions were accepted into the BOCA National and SBCCI Standard Codes by 1987. A fire resistive separation has been required between the fabrication area and chemical storage rooms with the degree of fire resistance varying depending on the code, but generally patterned after the approach used for required separations for flammable and combustible liquids established in NFPA 30. In any case, the required separation could not be less than one-hour.

The requirements to separate health hazards from physical hazards within the array of materials known as "high hazard" was first established in the Uniform Codes in 1988 and adopted by the BOCA National and SBCCI Standard Codes in 1993 and 1994 Editions respectively as those two codes evolved to resolve issues surrounding the storage and use of hazardous materials.

With recognition that a required one-hour separation has been established for 20 years (or more in the case of the H-5) these same requirements were adopted by NFPA and debated during the consensus process as NFPA 5000 evolved demonstrating that these requirements were subjected to wider view by members of industry and the public as that process evolved.

Footnote e has been added to avoid having the code user interpret that a separation is required between two different areas of the same occupancy. While this may appear obvious to some a question can be raised when multiple rooms or areas are constructed to serve operational needs. For example, an area that contains Class 2 oxidizers (H-3 materials) is located in an adjacent room containing flammable solids (also H-3 material) would not be required to have a fire resistive separation between the rooms. Without the footnote the code is subject to interpretation. On the other hand, Footnote f has been added to direct the user to Section 415.8.2.2 which does require a one hour separation between multiple fabrication areas each of which are in an H-5 occupancy. The required separation in this instance is based on the limitations imposed on ventilation systems, maximum quantities of HPM and other factors.

CGA is asking that the required mutual separation of one-hour between the H-3, H-4 and H-5 occupancies be returned to the established and accepted norm. Doing so will reconstitute the reasonable minimum safeguard for the required separation between these important occupancies.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The proposal provides needed separation between different classifications of H occupancies. See also proponent's reason.

Assembly Action:

None

Final Hearing Results

G161-07/08

AS

Code Change No: G162-07/08

Original Proposal

Table 508.4

Proponent: Martha (Marty) Gillis, Bureau Veritas North America, Inc., representing the Washington Association of Building Officials, Technical Code Development Committee

Revise table as follows:

**TABLE 508.4 (Supp)
REQUIRED SEPARATION OF OCCUPANCIES (HOURS)**

OCCUPANCY	A ^d , E		I		R ^e		F-2, S-2 ^{b,e} , U ^e		B, F-1, M, S-1		H-1		H-2		H-3, H-4, H-5	
	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS
A ^d , E ^d	N	N	1	2	1	2	N	1	1	2	NP	NP	3	4	2	3 ^a
I	—	—	N	N	1	NP	1	2	1	2	NP	NP	3	NP	2	NP
R ^e	—	—	—	—	N	N	1 ^c	2 ^c	1	2	NP	NP	3	NP	2	NP
F-2, S-2 ^{b,e} , U ^e	—	—	—	—	—	—	N	N	1	2	NP	NP	3	4	2	3 ^a
B, F-1, M, S-1	—	—	—	—	—	—	—	—	N	N	NP	NP	2	3	1	2 ^a
H-1	—	—	—	—	—	—	—	—	—	—	N	NP	NP	NP	NP	NP
H-2	—	—	—	—	—	—	—	—	—	—	—	—	N	NP	1	NP
H-3, H-4, H-5	—	—	—	—	—	—	—	—	—	—	—	—	—	—	N	NP

For SI: 1 square foot = 0.0929 m².

S = Buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1.

NS = Buildings not equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1.

N = No separation requirement.

NP = Not permitted.

- a. For Group H-5 occupancies, see Section 903.2.4.2
- b. Areas used only for private or pleasure vehicles shall be allowed to reduce separation by 1 hour.
- c. See Section 406.1.4
- d. Commercial kitchens need not be separated from the restaurant seating area that they serve.

Reason: This proposal is, in part, editorial, needed for consistency, and provides clean up.

Presently whenever either U or R occupancies are paired with any other occupancy the user must cross reference 406.1.4 needlessly since 406.1.4 only applies to mixed occupancies containing only the pairing of R and U. This proposal therefore relocates footnote "c" to the center where R and U cross in order to express that Footnote "c" and Section 406.1.4 are only applicable to this particular mixed occupancy condition (R with U).

This proposal seeks to relocate footnote "c" to the applicable cells where U and R occupancies cross in the center of the table in order to provide efficient use of the table and add clarity.

Cost Impact: This code change will not increase the cost of construction.

Public Hearing Results

Errata: Replace Footnote "a" in two places in the last column of the table for non sprinklered Group H-3, H-4 and H-5 Occupancies.

Committee Action:

Approved as Submitted

Committee Reason: The proposal is an editorial revision for the location in Table 508.4 for Footnote "c" that provides clarity to the table regarding the application of separation requirements for a mixed occupancy building with Groups R and U.

Assembly Action:

None

Final Hearing Results

G162-07/08

AS

Code Change No: G163-07/08

Original Proposal

Table 508.4

Proponent: Don Davies, Salt Lake City Corporation, representing the Utah Chapter of ICC

Revise table as follows:

**TABLE 508.4 (Supp)
REQUIRED SEPARATION OF OCCUPANCIES (HOURS)**

(Portions of table not shown remain unchanged)

- S = Buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1.
- NS = Buildings not equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1.
- N = No separation requirement.
- NP = Not permitted.

- a. For Group H-5 occupancies, see Section 903.2.4.2.
- b. The required separation from areas used only for private or pleasure vehicles shall be allowed to be reduced by 1 hour but to not less than one hour.
- c. See Section 406.1.4.
- d. Commercial kitchens need not be separated from the restaurant seating areas that they serve.

Reason: The code user is alerted in IBC Section 406.2.7 that there must be some type of occupancy separation between a garage and another occupancy which does not normally occur in the code. When one turns to Section 508.3 as directed they are directed to Section 508.3.2 as one of the options which allows nonseparated uses. In most instances the nonseparated option would be the preferred and likely used option. Even though vehicle fires have gone down and there is a good history of that there should be at least a minimal amount of protection to the adjoining uses as required in other areas of the code as required for private garages in Section 406.1.4 which have a few vehicles.

Cost Impact: This code change will increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The proposal was a good clarification that a minimum of 1 hour fire resistive construction is required for separation of areas housing private or pleasure vehicles.

Assembly Action:

None

Final Hearing Results

G163-07/08

AS

Code Change No: G167-07/08

Original Proposal

Section: 509.9

Proponent: Philip Brazil, PE, Reid Middleton, Inc., representing himself

Revise as follows:

509.9 (Supp) Multiple buildings above or below an enclosed or open Group S-2 parking garages. Where two or more buildings are provided above the horizontal assembly separating a ~~Group S-2 open or closed parking garage building below~~ from the buildings above in accordance with the special provisions in Sections 509.2, and 509.3 or 509.8, the buildings above the horizontal assembly shall be regarded as separate and distinct buildings and shall comply with all other provisions of this code as applicable to each separate and distinct building.

Reason: The current language applies to open and enclosed parking garages below horizontal assemblies in accordance with the provisions of Sections 509.2 and 509.3. Section 509.3 is limited to an open parking garage above the horizontal assembly and an enclosed parking garage below the horizontal assembly. Section 509.2, however, permits open or enclosed parking garages above or below the horizontal assembly. Section 509.8 has provisions similar to Section 509.3 except it is limited to an open parking garage above the horizontal assembly. The proposal revises Section 509.9 to more comprehensively account for the special provisions of Sections 509.2, 509.3 and 509.8 each of which permit multiple buildings above the horizontal assembly to be considered as separate and distinct buildings.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:**Approved as Modified****Modify the proposal as follows:**

509.9 (Supp) Multiple buildings above or below Group S-2 parking garages. Where two or more buildings are provided above the horizontal assembly separating a ~~Group S-2 open or closed parking garage building below~~ from the buildings above in accordance with the special provisions in Section 509.2, 509.3 or 509.8, the buildings above the horizontal assembly shall be regarded as separate and distinct buildings and shall comply with all other provisions of this code as applicable to each separate and distinct building.

Committee Reason: The proposal revises Section 509.9 to more comprehensively account for the special provisions of Sections 509.2, 509.3 and 509.8, each of which permit multiple buildings above the horizontal assembly to be considered as separate and distinct buildings. The modification was to restore the phrase "Group S-2 open or closed parking garage" as without this phrase the section was thought to lose its intent.

Assembly Action:**None**

Final Hearing Results

G167-07/08

AM

Code Change No: G168-07/08

Original Proposal

Section: 509.9

Proponent: Maureen Traxler, City of Seattle, WA, representing the Department of Planning and Development

Revise as follows:

509.9 (Supp) Multiple buildings above an enclosed or open Group S-2 parking garage. Where two or more buildings are provided above the horizontal assembly separating a Group S-2 open or closed parking garage from the buildings above in accordance with the special provisions in Sections 509.2 and 509.3, the buildings above the horizontal assembly shall be regarded as separate and distinct buildings from each other and shall comply with all other provisions of this code as applicable to each separate and distinct building.

Reason: Section 509.9 was added to the code by item G158-06/07. It addresses one interpretation issue, but raises another question. The intent behind G158-06/07 was to clarify that the buildings above the horizontal separation are separate, but the language also seems to say that those upper buildings are to be considered as separate from the building below the horizontal separation. Section 509.2 clearly states that the horizontal separation “shall be considered as a separate and distinct building for the purpose of determining area limitations, continuity of fire walls, limitation of number of stories and type of construction”. The effect of the horizontal separation in Section 509.3 is even more limited—the garage below the separation “shall be classified as a separate and distinct building for the purpose of determining the type of construction”.

This proposal removes the inconsistency between the new Section 509.9 and Sections 509.2 and 509.3 by stating that the buildings above the horizontal separation are separate from each other, and allowing Section 509.2 and 509.3 to answer the question of whether they are separate from the building below the separation.

Cost Impact: This code change will not increase the cost of construction.

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The proponent sought to clarify that each of the buildings above the horizontal assembly were considered as separate from one another, but the committee felt that the code was already clear enough in this regard.

Assembly Action:

None

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

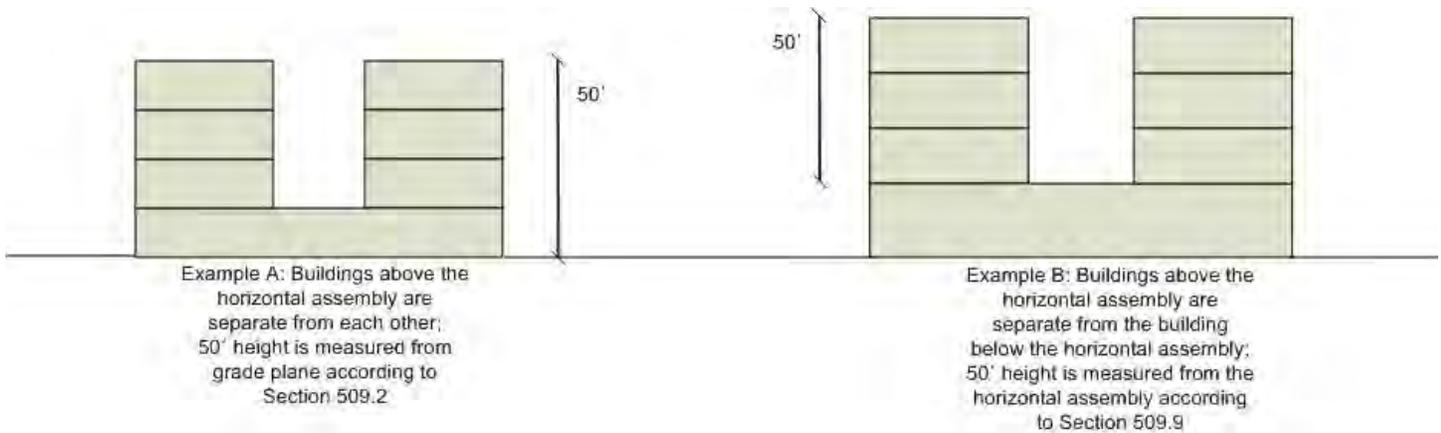
Public Comment:

Maureen Traxler, City of Seattle Department of Planning and Development, requests Approval as Submitted.

Commenter-s Reason: Section 509.9 says that, for buildings built according to Section 509.2 or 509.3, the buildings above the horizontal assembly are separate buildings. It doesn't say what they are separate from, and could easily be read to say they are separate from the building below the horizontal assembly.

The sketches below illustrate the two interpretations of Section 509.9. The buildings in both sketches comply with Section 509.2—their lower stories are parking garages of Type IA construction; the upper stories are unsprinklered Group B occupancies of Type VA construction. Example A illustrates the correct interpretation of Section 509.9, which is that the Type VA buildings are separate from each other, but are only separate from the lower story to the extent provided in Section 509.2. Example B illustrates the effect of interpreting Section 509.9 as allowing the Type VA stories to be separate from the Type IA story—if the height of the building is measured from the top of the three-hour separation, the allowable building height is much greater.

This proposal is consistent with the reason for adding this section to the code in the 2006-2007 code cycle. The reason for that proposal stated “This text is needed to clarify when two or more buildings are built atop a common parking garage that the buildings above the garage are to be considered as distinct buildings separate *from one another.*” [emphasis added]



Final Hearing Results

G168-07/08 **AS**

Code Change No: G172-07/08

Original Proposal

Table 602

Proponent: Sarah A. Rice, CBO, Schirmer Engineering Corporation

Revise table as follows:

**TABLE 602
FIRE-RESISTANCE RATING REQUIREMENTS FOR EXTERIOR
WALLS BASED ON FIRE SEPARATION DISTANCE^{a, e}**

FIRE SEPARATION DISTANCE = X (feet)	TYPE OF CONSTRUCTION	OCCUPANCY GROUP H ^f	OCCUPANCY GROUP F-1, M, S-1 ^g	OCCUPANCY GROUP A, B, E, F-2, I, R, S-2 ^g , U ^b
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(Portions of table not shown remain unchanged)

For SI: 1 foot = 304.8 mm.

- a. Load-bearing exterior walls shall also comply with the fire-resistance rating requirements of Table 601.
- b. For special requirements for Group U occupancies see Section 406.1.2
- c. See Section 705.1.1 for party walls.
- d. Open parking garages complying with Section 406 shall not be required to have a fire-resistance rating.
- e. The fire-resistance rating of an exterior wall is determined based upon the fire separation distance of the exterior wall and the story in which the wall is located.
- f. For special requirements for Group H occupancies see Section 415.3
- g. For special requirements for Group S aircraft hangers see Section 412.2.1

Reason: Similar to footnote b which references the special provisions applying to fire separation and fire-resistance rating for Group U exterior walls, these footnotes would provide reference to the other two provisions in Chapter 4 where there are unique separation or fire-resistance requirements based on distance to property line. The additional footnotes are proposed for consistency and for clarity for the code users. With respect to Group H occupancies there are additional separation requirements that are greater than those of Table 602. For aircraft hangers, there is a greater fire resistance rating imposed than required by Table 602.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The added footnotes provide clarity to the code by referencing relevant fire resistive separation requirements for Group H Occupancies and Group S-2 aircraft hangers.

Assembly Action:

None

Final Hearing Results

G172-07/08

AS

Code Change No: G178-07/08

Original Proposal

Sections: 1202; IRC R202;

Proponent: Daniel J. Walker, PE, Thomas Associates, Inc., representing the National Sunroom Association

THESE PROPOSALS ARE ON THE AGENDA OF THE IBC GENERAL AND THE IRC B/E CODE DEVELOPMENT COMMITTEES AS 2 SEPARATE CODE CHANGES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IBC GENERAL

Revise as follows:

**SECTION 1202
DEFINITIONS**

SUNROOM ADDITION. A one-story addition structure added attached to an existing building with a glazing area in excess of 40 percent of the gross area of the structure’s exterior walls and roof.

Reason: The definition of a Sunroom is inconsistent in the IBC when compared to the IRC and IECC. This proposal seeks to unify the definition in all three codes. This revised definition is necessary because sunrooms are often constructed as a part of a building during the initial construction, not only as additions to existing buildings.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

PART II – IRC BUILDING/ENERGY

Revise as follows:

**SECTION R202
GENERAL DEFINITIONS**

SUNROOM. A one-story structure attached to a dwelling building with a glazing area in excess of 40 percent of the gross area of the structure’s exterior walls and roof.

Reason: The definition of a Sunroom is currently inconsistent in the IRC, IBC and IECC. This proposal seeks to unify the definition in all three codes. This revised definition deletes the term “dwelling” and replaces it with “building” because, in the IECC, the term “building” includes dwellings and other types of structures where sunrooms are used. The change is a clarification since sunrooms can be utilized as common areas in buildings that have multiple dwelling units, restaurant dining areas, etc.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

PART I – IBC GENERAL
Committee Action:

Approved as Submitted

Committee Reason: The revised definition brings consistency with the IRC for the term “sunroom”.

Assembly Action:

None

PART II – IRC-B/E
Committee Action:

Disapproved

Committee Reason: This new language for the definition of Sunroom is not appropriate for the IRC. The scope of the IRC and the structures it deals with is more accurately portrayed with the current definition.

Assembly Action:

None

Final Hearing Results

G178-07/08, Part I
G178-07/08, Part II

AS
D

Code Change No: G179-07/08

Original Proposal

Sections: 1203.2.1; IRC R806.1

Proponent: Matthew Dobson, Vinyl Siding Institute

THESE PROPOSALS ARE ON THE AGENDA OF THE IBC GENERAL AND IRC BUILDING/ENERGY CODE DEVELOPMENT COMMITTEES AS 2 SEPARATE CODE CHANGES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IBC GENERAL

1203.2.1 (Supp) Openings into attic. Exterior openings into the attic space of any building intended for human occupancy shall be protected to prevent the entry of birds, squirrels, rodents, snakes and other similar creatures. Openings for ventilation having a least dimension of $\frac{4}{8}$ $\frac{1}{16}$ inch (~~3.2~~ 1.6 mm) minimum and $\frac{1}{4}$ inch (6.4 mm) maximum shall be permitted. Openings for ventilation having a least dimension larger than $\frac{1}{4}$ inch (6.4 mm) shall be provided with corrosion resistant wire cloth screening, hardware cloth, perforated vinyl or similar material with openings having a least dimension of $\frac{4}{8}$ $\frac{1}{16}$ inch (~~3.2~~ 1.6 mm) minimum and $\frac{1}{4}$ inch (6.4 mm) maximum openings. Where combustion air is obtained from an attic area, it shall be in accordance with Chapter 7 of the *International Mechanical Code*.

PART II – IRC BUILDING/ENERGY

R806.1 (Supp) Ventilation required. Enclosed attics and enclosed rafter spaces formed where ceilings are applied directly to the underside of roof rafters shall have cross ventilation for each separate space by ventilating openings protected against the entrance of rain or snow. Ventilation openings shall have a least dimension of 1/16 inch (1.6 mm) minimum and 1/4 inch (6.4 mm) maximum. Ventilation openings having a least dimension larger than 1/4 inch (6.4 mm) shall be provided with corrosion-resistant wire cloth screening, hardware cloth, or similar material with openings having a least dimension of $\frac{4}{8}$ $\frac{1}{16}$ inch (~~3.2~~ 1.6 mm) minimum and 1/4 inch (6.4 mm) maximum openings.

Reason: Soffit and opening sizes have changed and become more innovative, products like hidden vents and other have helped to improve the architectural ability of these exterior attic openings. This change does not change the venting requirement but reflects minimum requirements that are now being used effectively in the market place. It is also more consistent with current language in the IRC.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

PART I – IBC GENERAL
Committee Action:

Approved as Submitted

Committee Reason: The proposal clarifies the code and is consistent with the provisions of the IRC for attic vents.

Assembly Action:

None

PART II – IRC
Committee Action:

Approved as Submitted

Committee Reason: This change adds necessary clarity on how to figure the minimum opening requirements for attic vents.

Assembly Action:

None

Final Hearing Results

G179-07/08, Part I	AS
G179-07/08, Part II	AS

Code Change No: G180-07/08

Original Proposal

Sections: 1207.2.1 (New), Chapter 35 (New); IRC AK102.1 (New), AK104 (New)

Proponent: Jason Thompson, PE, National Concrete Masonry Association, representing the Masonry Alliance for Codes and Standards (MACS); Phil Samblanet, The Masonry Society

THESE PROPOSALS ARE ON THE AGENDA OF THE IBC GENERAL AND IRC BUILDING/ENERGY DEVELOPMENT COMMITTEES AS 2 SEPARATE CODE CHANGES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IBC GENERAL

1. Add new text as follows:

1207.2.1 Masonry. The sound transmission class of concrete masonry and clay masonry assemblies shall be calculated in accordance with TMS 0302 or determined through testing in accordance with ASTM 90.

2. Add standard to Chapter 35 as follows:

The Masonry Society

TMS 0302-07 Standard Method for Determining the Sound Transmission Class Rating for Masonry Walls

PART II – IRC BUILDING/ENERGY

1. Add new text as follows:

AK102.1.1 Masonry. The sound transmission class of concrete masonry and clay masonry assemblies shall be calculated in accordance with TMS 0302 or determined through testing in accordance with ASTM 90.

2. Add standard to Section AK104 as follows:

The Masonry Society

TMS 0302-07 Standard Method for Determining the Sound Transmission Class Rating for Masonry Walls

Reason: The Masonry Society (TMS) has recently updated and published a new standardized method for calculating the sound transmission class (STC) for various concrete and clay masonry wall assemblies. The resulting STC values are derived from laboratory testing of masonry assemblies in accordance with ASTM E 90. Introducing the reference to TMS 0302 will provide users with quicker alternatives to complying with the IBC and IRC requirements for STC ratings.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Note: The following analysis was not in the Code Change Proposal book but was posted on the ICC website.

Analysis: Review of proposed new standard TMS 0302-07 indicated that, in the opinion of ICC Staff, the standard **did** comply with ICC standards criteria.

PART I – IBC GENERAL

Committee Action:

Approved as Submitted

Committee Reason: The new standard and proposed language makes it easier to understand how to apply the sound transmission requirements for masonry.

Assembly Action:

None

PART II – IRC

Committee Action:

Approved as Submitted

Committee Reason: This change brings a new standard into the code to promote Sound Transmission Class (STC) rating for masonry assemblies. Also, there are liability issues with sound transmission and this should help the builder in this regard.

Assembly Action:

None

Final Hearing Results

G180-07/08, Part I	AS
G180-07/08, Part II	AS

Code Change No: G182-07/08

Original Proposal

Sections: 1210.2; IPC 310.5

Proponent: Lawrence Brown, CBO, National Association of Home Builders (NAHB)

THESE PROPOSALS ARE ON THE AGENDA OF THE IBC GENERAL, AND IPC CODE DEVELOPMENT COMMITTEES AS 2 SEPARATE CODE CHANGES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IBC GENERAL

Revise as follows:

1210.2 Walls and partitions. Walls and partitions within 2 feet (610 mm) of urinals and water closets shall have a smooth, hard, nonabsorbent surface, to a height of 4 feet (1219 mm) above the floor, and except for structural elements, the materials used in such walls shall be of a type that is not adversely affected by moisture.

Exceptions:

1. Dwelling units and sleeping units.
2. Toilet rooms that are not accessible to the public and which have not more than one water closet.

Accessories such as grab bars, towel bars, paper dispensers and soap dishes, provided on or within walls, shall be installed and sealed to protect structural elements from moisture.

PART II – IPC

310.5 Urinal partitions. Each urinal utilized by the public or employees shall occupy a separate area with walls or partitions to provide privacy. ~~The construction of such walls or partitions shall incorporate waterproof, smooth, readily cleanable and nonabsorbent finish surfaces.~~ The walls or partitions shall begin at a height not more than 12 inches (305 mm) from and extend not less than 60 inches (1524 mm) above the finished floor surface. The walls or partitions shall extend from the wall surface at each side of the urinal a minimum of 18 inches (457 mm) or to a point not less than 6 inches (152 mm) beyond the outermost front lip of the urinal measured from the finished back wall surface, whichever is greater.

Exceptions:

1. Urinal partitions shall not be required in a single occupant or unisex toilet room with a lockable door.
2. Toilet rooms located in day care and child care facilities and containing two or more urinals shall be permitted to have one urinal without partitions.

Reason: Part I: To provide consistency with terminology in the IBC and the IPC for walls separating water closets and urinals.

Part II: This change provides consistency between the IPC and the IBC for the walls and partitions surrounding urinals and water closets. As currently written the provisions for these surfaces in the IBC and IPC conflict with each other. The IBC requires a, "smooth, hard, nonabsorbent surface...that is not adversely affected by moisture". IPC Section 310.5 requires a, "waterproof, smooth, readily cleanable and nonabsorbent finish surfaces." The walls (partitions) only for the urinals (not the water closets) would also be required to be "readily cleanable".

To eliminate this inconsistency, the text of the second sentence is stricken. In addition, it is not necessary for the IPC contain the provisions needed for these surfaces. IPC Section 310.3 (shown below) already requires that, "the interior finish surfaces of toilet rooms shall comply with the International Building Code." IBC Section 1210.2 states (with the proposed modification): "Walls and partitions within 2 feet (610 mm) of urinals and water closets shall have a smooth, hard, nonabsorbent surface, to a height of 4 feet (1219 mm) above the floor, and except for structural elements, the materials used in such walls shall be of a type that is not adversely affected by moisture." Please note that Section IPC Section 310.3 also applies to the partitions for water closet compartment surfaces covered by Section 310.4. As there is no need for this repetitive text to be contained within Section 310.4 for water closets, there should no need to include it in Section 310.5 for urinals.

(IPC) 310.3 Interior finish. Interior finish surfaces of toilet rooms shall comply with the International Building Code.

It is also understood by the Proponent that the IBC General Code Committee has jurisdiction over wall surfaces, not the Plumbing Code Committee. With the modification to IBC Section 1210.2, and the proposed change for the IPC, the concerns of both Code Committees for these walls are addressed. .

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

PART I – IBC GENERAL

Committee Action:

Approved as Submitted

Committee Reason: This proposal will make sure that partitions adjacent to water closets and urinals will be constructed of non-absorbent materials.

Assembly Action:

None

PART II – IPC

Committee Action:

Approved as Submitted

Committee Reason: Material requirements for walls or partitions is best covered by the IBC and not the IPC. Elimination of the text in the IPC avoids the current discrepancies between the IBC and IPC on types of finish required for walls and partitions.

Assembly Action:

None

Final Hearing Results

G182-07/08, Part I
G182-07/08, Part II

AS
AS

Code Change No: **G184-07/08**

Original Proposal

Sections: [P] 2902.6 (New) (IPC 310.5)

Proponent: John Berry, Cole + Russell Architects, Inc.

Add new text as follows:

[P] 2902.6 (IPC 310.5) Urinal partitions. Each urinal utilized by the public or employees shall occupy a separate area with walls or partitions to provide privacy. The construction of such walls or partitions shall incorporate waterproof, smooth, readily cleanable and nonabsorbent finish surfaces. The walls or partitions shall begin at a height not more than 12 inches (305 mm) from and extend not less than 60 inches (1524 mm) above the finished floor surface. The walls or partitions shall extend from the wall surface at each side of the urinal a minimum of 18 inches (457 mm) or to a point not less than 6 inches (152 mm) beyond the outermost front lip of the urinal measured from the finished back wall surface, whichever is greater.

Exceptions:

1. Urinal partitions shall not be required in a single occupant or unisex toilet room with a lockable door.
2. Toilet rooms located in day care and child care facilities and containing two or more urinals shall be permitted to have one urinal without partitions.

Reason: This new section is an exact duplication of Section 310.5, IPC. This requirement was recently added to the IPC. The specification of and design of urinal partitions is traditionally accomplished by an architect, whom typically is not as familiar with the IPC. Locating these provisions in the building code is reasonable since plumbing engineers typically would not be concerned with these provisions and typically would not inform the architect of such requirements. Architects are accustomed to reviewing Chapter 29 for plumbing fixture counts, so this is a reasonable location to include this requirement in the code.

This proposal is similar to my other proposal adding Section 2902.6 for water closet compartments.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: Requirements for walls surrounding urinals are in IBC 1210.2 and IPC [B] 419.3.

The proposed language is existing in Section 310.5 of the IPC. The maintenance of the technical content of the text to be placed in the IBC by this proposal rests with the IPC Code Development Committee. The need for and duplication of the language within the IBC is a matter to be determined by the IBC General Code Development Committee.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: Providing this section within the IBC is beneficial as it is often overlooked by designers that are not familiar with the IPC.

Assembly Action:

None

Final Hearing Results

G184-07/08

AS

Code Change No: **G185-07/08**

Original Proposal

Sections: [P] 2902.6 (New) (IPC 310.4)

Proponent: John Berry, Cole + Russell Architects, Inc.

Add new text as follows:

[P] 2902.6 (IPC 310.4) Water closet compartment. Each water closet utilized by the public or employees shall occupy a separate compartment with walls or partitions and a door enclosing the fixtures to ensure privacy.

Exceptions:

1. Water closet compartments shall not be required in a single-occupant toilet room with a lockable door.
2. Toilet rooms located in a day care and child care facilities and containing two or more water closets shall be permitted to have one water closet without an enclosing compartment.

Reason: This new section is an exact duplication of Section 310.4, IPC. The specification of and design of toilet stall partitions is traditionally accomplished by an architect, whom typically is not as familiar with the IPC. Locating these provisions in the building code is reasonable since Plumbing engineers typically would not be concerned with these provisions and typically would not inform the architect of such requirements. Architects are accustomed to reviewing Chapter 29 for plumbing fixture counts, so this is a reasonable location to include this requirement in the code.

This proposal is similar to my other proposal adding Section 2902.7 for urinal partitions. It was the realization that the IPC now requires urinal partitions that drove the decision to also include this section on water closet compartments.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: The Requirements for walls surrounding water closets are in IBC1210.2.

The proposed language is existing in Section 310.5 of the IPC. The maintenance of the technical content of the text to be placed in the IBC by this proposal rests with the IPC Code Development Committee. The need for and duplication of the language within the IBC is a matter to be determined by the IBC General Code Development Committee.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The proposal was approved for consistency with the action taken on G184-07/08. Such provisions are often overlooked by designers not familiar with the IPC.

Assembly Action:

None

Final Hearing Results

G185-07/08

AS

Code Change No: **G188-07/08**

Original Proposal

Section: 3002.4

Proponent: Ed Donoghue, Edward Donoghue Associates Inc. (EADAI), representing the National Elevator Industry, Inc. (NEII)

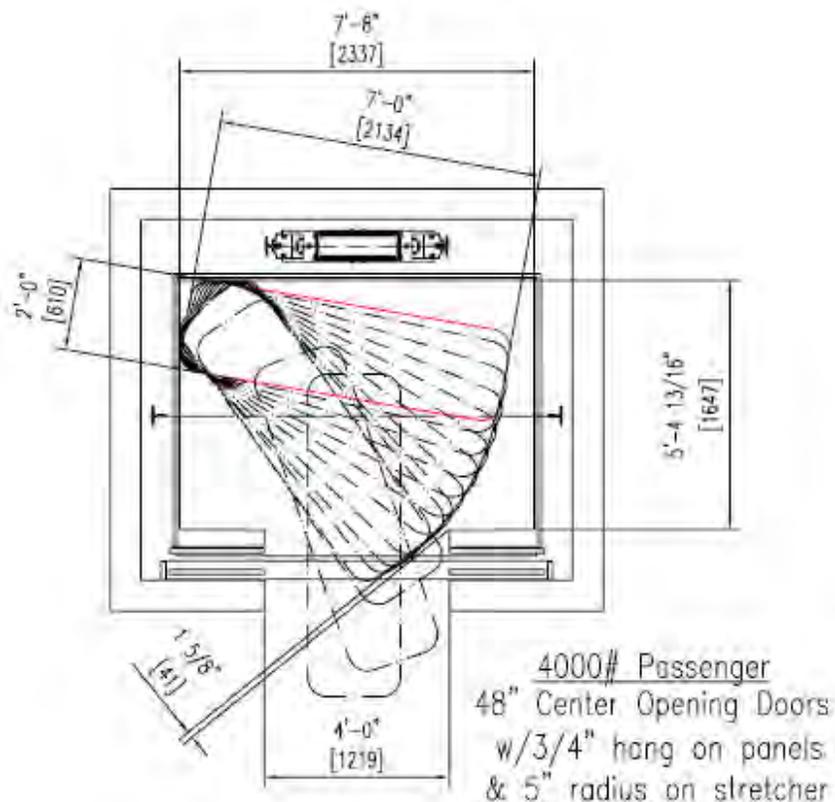
Revise as follows:

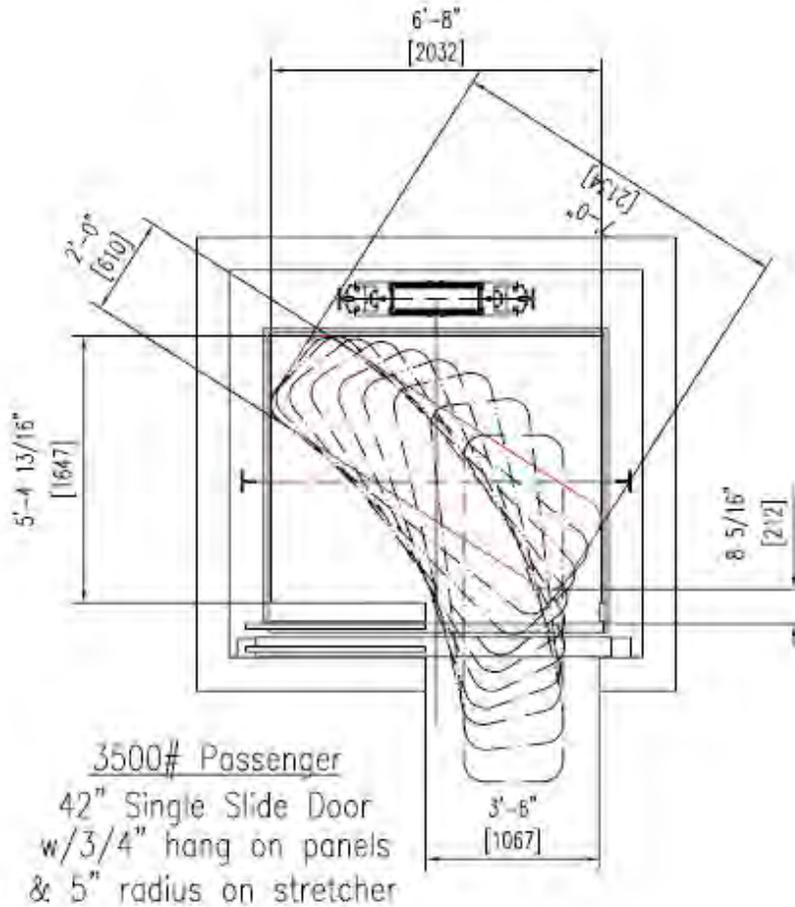
3002.4 (Supp) Elevator car to accommodate ambulance stretcher. Where elevators are provided in buildings four or more stories above grade plane or four or more stories below grade plane, at least one elevator shall be provided for fire department emergency access to all floors. The elevator car shall be of such a size and arrangement to accommodate a 24-inch by 84-inch (610 mm by 2134 mm) with not less than 5 inch (127mm) radius corners, ambulance stretcher in the horizontal, open position and shall be identified by the international symbol for emergency medical services (star of life). The symbol shall not be less than 3 inches (76 mm) high and shall be placed inside on both sides of the hoistway door frame.

Reason: All ambulance stretchers found to date, are made from tubular metal, formed with radius or chamfered corners. Adding this change reflects actual stretcher size and will allow the industry to better meet the requirement with more flexibility and appropriately sized cars, while still meeting the size requirement desired by the IBC. This change will also have added benefit of providing direction to the stretcher suppliers to aid in standardizing their products. None of the vendors researched to date offer a 24 inch by 84 inch ambulance stretcher, Stryker, the largest stretcher manufacturer, has a standard stretcher of 23 inches by 83 inches, with a combination of radius and chamfered corners. Further the only standard for ambulance stretchers found was a European Specification, EN 1865:2000. Section 4.1.5 Frame states "All corners of the frame shall be radiused for greater safety."

See the following figures.

Cost Impact: The code change proposal will increase the cost of construction.





Public Hearing Results

Committee Action:

Approved as Modified

Modify the proposal as follows:

3002.4 (Supp) Elevator car to accommodate ambulance stretcher. Where elevators are provided in buildings four or more stories above grade plane or four or more stories below grade plane, at least one elevator shall be provided for fire department emergency access to all floors. The elevator car shall be of such a size and arrangement to accommodate an ambulance stretcher 24-inch by 84-inch (610 mm by 2134 mm) with not less than 5 inch (127mm) radius corners, ambulance stretcher in the horizontal, open position and shall be identified by the international symbol for emergency medical services (star of life). The symbol shall not be less than 3 inches (76 mm) high and shall be placed inside on both sides of the hoistway door frame.

Committee Reason: Ambulance stretchers found to date, are made from tubular metal, formed with radius or chamfered corners. Adding this change reflects actual stretcher size and will allow the industry to better meet the requirement with more flexibility and appropriately sized cars, while still meeting the size requirement desired by the IBC. This change will also have added benefit of providing direction to the stretcher suppliers to aid in standardizing their products.

Assembly Action:

None

Final Hearing Results

G188-07/08

AM

Code Change No: **G189-07/08**

Original Proposal

Section: 3004.1

Proponent: Masoud Sabounchi, Advanced Consulting Engineers, Inc., representing the Colorado Chapter ICC

Revise as follows:

3004.1 Vents required. Hoistways of elevators and dumbwaiters penetrating more than three stories shall be provided with a means for venting smoke and hot gases to the outer air in case of fire.

Exceptions:

1. In occupancies of other than Groups R-1, R-2, I-1, I-2 and similar occupancies with overnight sleeping quarters, venting of hoistways is not required where the building is equipped throughout with an approved automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2.
2. Sidewalk elevator hoistways are not required to be vented.
3. Elevators contained within and serving parking garages only.
4. Elevators within individual residential dwelling units.

Reason: As noted in the IBC Commentary "Ventilation of hoistways is required to prevent the accumulation and spread of hot smoke and gases from a fire to the upper stories of a building."

Parking garages have vehicle ramps that are open to all garage level. Since ramps are open to each other, migration of smoke and hot gases from garage level to another garage level would be via the open ramps. Due to lack of pressure build up during a fire on a garage level where smoke and hot gases travel thru the ramps, elevator shafts would not transfer smoke from one garage level to another garage level.

Floors within residential dwelling units are permitted to be open to each other per IBC Section 707.2 exception 1. Justification is as noted above.

Cost Impact: The code change proposal will reduce the cost of construction.

Public Hearing Results

Committee Action:

Approved as Modified

Modify the proposal as follows:

3004.1 Vents required. Hoistways of elevators and dumbwaiters penetrating more than three stories shall be provided with a means for venting smoke and hot gases to the outer air in case of fire.

Exceptions:

1. In occupancies of other than Groups R-1, R-2, I-1, I-2 and similar occupancies with overnight sleeping quarters, venting of hoistways is not required where the building is equipped throughout with an approved automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2.
2. Sidewalk elevator hoistways are not required to be vented.
3. Elevators contained within and serving open parking garages only.
4. Elevators within individual residential dwelling units.

Committee Reason: This revision eliminates the requirement for venting the elevator hoistway when elevators are located in open parking garages. Parking garages have vehicle ramps that are open to all garage levels. Since the vehicle ramps are open to each other, migration of smoke and hot gases from garage level to another garage level would be via the ramps. Due to lack of pressure build up during a fire, elevator shafts would not transfer smoke from one garage level to another garage level. The modification was to limit the scope of exception 3 to open parking garages due to concerns related to smoke build up in enclosed parking garages.

Floors within residential dwelling units are permitted to be open to each other per IBC Section 707.2 Exception 1. Since any smoke would be migrating through the stair opening, venting in the elevator hoistway is not required.

Assembly Action:

None

Final Hearing Results

G189-07/08

AM

Code Change No: **G190-07/08**

Original Proposal

Section: 3004.3

Proponent: Ed Donoghue, Edward Donoghue Associates Inc. (EADAI)

Revise as follows:

3004.3 (Supp) Area of vents. Except as provided for in Section 3004.3.1, the area of the vents shall not be less than 3¹/₂ percent of the area of the hoistway nor less than 3 square feet (0.28 m²) for each elevator car, and not less than 3¹/₂ percent nor less than 0.5 square feet (0.047 m²) for each dumbwaiter car in the hoistway, whichever is greater. Of the total required vent area, not less than one-third shall be permanently open. Closed portions of the required vent area shall consist of openings glazed with annealed glass not greater than 0.125 inch (3.2 mm) in thickness.

Exception: The total required vent area shall not be required to be permanently open where all the vent openings automatically open upon detection of smoke in the elevator lobbies or hoistway, upon power failure and upon activation of a manual override control. The manual override control shall be capable of opening and closing the vents and shall be located in an approved location.

Reason: The manual override control should be able to both open and close the vents. As currently written the section only seems to require that such manual controls open the vents

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The manual controls need to be capable of both opening and closing the vents.

Assembly Action:

None

Final Hearing Results

G190-07/08

AS

Code Change No: **G195-07/08**

Original Proposal

Sections: 3007.3 (New), 3007.6

Proponent: Ed Donoghue, Edward Donoghue Associates Inc. (EADAI)

1. Add new text as follows:

3007.3 (Supp) Hoistway lighting. The entire hoistway shall be illuminated at not less than 1 foot-candle (11 lux) at each hoistway entrance when firefighters' emergency operation is active.

(Renumber subsequent sections)

2. Revise as follows:

3007.6 (Supp) Electrical power. The following features serving each fire service access elevator shall be supplied by both normal power and Type 60/Class 2/Level 1 standby power:

1. Elevator equipment.
2. Elevator hoistway lighting
- ~~2-~~ 3. Elevator machine room ventilation and cooling equipment.
- ~~3-~~ 4. Elevator controller cooling equipment.

Reason: The focus of this proposal was upon providing illumination to assist fire fighters as they to advance up into the building. The prescribed procedure before leaving the designated level (DL), is to shine a light up into the hoistway to try and detect smoke, flame or water above them. They will repeat this step every 5 floors until they safely arrive at their staging floor, which is two floors below the lowest reported floor in alarm. By having hoistway lighting this will make their life safety maneuver much more effective.

Background. As a result of the September 11, 2001 attacks on the World Trade Center, code provisions for emergency egress from tall buildings are being re-examined. There is renewed interest in the use of elevators for both occupant egress and fire fighters access. Therefore a Workshop on the Use of Elevators in Fires and Other Emergencies was held March 2-4, 2004, in Atlanta, Georgia. The workshop was cosponsored by American Society of Mechanical Engineers (ASME International), National Institute of Standards and Technology (NIST), International Code Council (ICC), National Fire Protection Association (NFPA), U.S. Access Board, and the International Association of Fire Fighters (IAFF).

The workshop focused on two general topics:

- (1) Use of Elevators by Fire fighters and
- (2) Use of Elevators by Occupants during Emergencies

To follow up on the ideas generated at the workshop, 2 task groups were formed; one for each topic. Their goals are:

- Review the suggestions from the Workshop on the Use of Elevators in Fires and other Emergencies.
- Develop a prioritized list of issues.
- Conduct a hazard analysis of the prioritized list of issues to see if there are any residual hazards.
- Draft code revisions for those issues that survive the process and the task group members still want addressed.

The membership of these task groups is broad and includes representatives from the elevator industry and manufacturers of devices such as fire alarms, the fire service, model codes and standards development organizations, and the accessibility community as well as fire protection engineers, architects and specialists in human factors and behavior. Since February 2005 the groups have each been conducting a hazard analysis on their assigned topic. The results of the hazard analysis focused upon the fire fighter needs is nearing completion.

The task group studied 16 different cases. In these cases a particular hazard followed by a cause/trigger was reviewed. The result of the hazard interacting with cause/trigger events may create a particular incident/effect. To address possible incident/effects corrective actions are proposed. Such corrective actions are then reviewed to see if they create any residual hazards. The hazard analysis then carries out each of the residual hazards with additional corrective actions until the hazard is mitigated. It is strictly a hazard analysis (i.e. not probabilistic) and certain assumptions were made such as a single fire start in a high rise building.

The code changes generated by this analysis are related both to the summary of corrective actions resulting from the hazard analysis and the existing language related to fire service access elevators placed into the 2007 supplement.

These proposals will work with the 2007 supplement requirements for fire service access elevators to address these concerns. It should be noted that the hazard analysis assumed a lobby to be directly connected with the fire service access elevator thus making the result of the analysis consistent with the philosophical approach found in the 2007 Supplement.

Cost Impact: The code change proposal will increase the cost of construction.

Analysis: The 2007 Supplement includes a new Section 3007, Fire Service Access Elevators. The requirement is scoped in Section 403.10.

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The proposal is not clear how it would deal with multiple elevators in a single hoistway, and how the light level would be measured. Generally, the committee felt that such requirements were unnecessary.

Assembly Action:

None

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Brian Black BDBlack Codes, Inc., representing the National Elevator Industry, Inc., John J. O'Donoghue, representing the International Association of Fire Fighters, and Jack J. Murphy, representing the Fire Safety Directors Association of Greater New York, request Approval as Modified by this public comment.

Modify proposal as follows:

3007.3 (Supp) Hoistway lighting. When firefighters' emergency operation is active the entire height of the hoistway shall be illuminated at not less than 1 foot-candle (11 lux) at each hoistway entrance when firefighters' emergency operation is active as measured from the top of the car of each fire service access elevator.

(Portions of proposal not shown remain unchanged)

Commenter's Reason: The proposal was modified to address the comments received at the ICC hearing regarding adequacy of light, location of measurement and extent of hoistway coverage. The focus of this proposal was upon providing illumination to assist fire fighters as they to advance up into the building. If firefighters become trapped in a stopped elevator and need to self rescue through the top of car emergency exit, they need adequate light to safely escape. The illumination level specified is taken from means of egress illumination provisions of section 1006 of the IBC.

The current prescribed procedure before leaving the elevator's designated level (typically the ground floor) is to shine a light up into the hoistway to try and detect smoke, flame or water above them. They will repeat this step every 5 floors until they safely arrive at their staging floor, which is two floors below the lowest reported floor in alarm. By providing hoistway lighting, this will make their life safety maneuver much more effective.

Final Hearing Results

G195-07/08

AMPC

Code Change No: G196-07/08

Original Proposal

Sections: 3007.3.3, 3007.3.3.1 (New)

Proponent: Gregory J. Cahanin, Cahanin Fire and Code Consulting, representing the Smoke Safety Council

Revise as follows:

3007.3.3 Lobby doorways. Each fire service access elevator lobby shall be provided with a doorway that is protected with a ³/₄-hour fire door assembly complying with Section 715.4.

3007.3.3.1 Fire doors. Fire door assemblies shall meet the requirements for a smoke and draft control door assembly tested in accordance with UL 1784 without an artificial bottom seal installed across the full width of the bottom of the door assembly during the test. The air leakage rate of the door assembly shall not exceed 3.0 cubic feet per minute per square foot [ft³/(min x ft²)](0.015424 m³/ s x m²) of door opening at 0.10 inch (24.9 Pa) of water column for both the ambient temperature and elevated temperature tests. Louvers shall be prohibited. Installation of smoke doors shall be in accordance with NFPA 105.

Reason: This revision to lobby doorways as a part of the newly approved Fire Service Access Elevator requirements brings consistency with the door specification requirements found in the code. While the 715.4 reference now in this new section will lead many to believe that 715.4.3.1 is to be applied; the language of 715.4 states that doors conforming to 715.4.1, 715.4.2 or 715.4.3 are approved.

Provisions added to the IBC in the last cycle establish a Fire Service Access Elevator that will operate through a fire event for the use of firefighters and occupants that are rescued from upper floors due to mobility impairments or by virtue of being trapped by the fire on upper floors. Sections 715.4.3.1 in the code provide more complete prescriptive requirements for the doors behind which occupants and firefighters may seek refuge.

Doors which are utilized to protect occupants and rescue personnel for extended periods of time will be challenged by smoke spread on a fire floor that is impacted by the size of the fire, the presence or absence of building ventilation on the fire floor, stack effect, and wind load upon the building. The UL 1784 test allows for testing with or without an artificial bottom seal, with the use of duct tape being the typical mode of providing an artificial bottom seal during testing. Doors which have been tested to UL 1784 without taping of the bottom of the door and passed the leakage requirements mirror possible smoke impact that will be experienced during a fire better provide for the safety of firefighters and occupants staying in the Fire Service Access Elevator lobby for extended periods of time.

Cost Impact: There is no cost impact.

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The reference to Chapter 7 should be more specific to Section 715.4.3.1. In addition the issue being addressed by this proposal is better addressed within Chapter 7 instead of within Section 3007.

Assembly Action:

None

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because public comments were submitted.

Public Comment 1:

Mike Ashley, CBO, Alliance for Fire and Smoke Containment and Control (AFSCC), requests Approval as Modified by this public comment.

Modify proposal as follows:

3007.3.3 Lobby doorways. Each fire service access elevator lobby shall be provided with a doorway that is protected with a $\frac{3}{4}$ -hour fire door assembly complying with Section 715.4. The fire door assembly shall also comply with the smoke and draft control door assembly requirements of Section 715.4.3.1 with the UL1784 test conducted without the artificial bottom seal.

~~**3007.3.3.1 Fire doors.** Fire door assemblies shall meet the requirements for a smoke and draft control door assembly tested in accordance with UL 1784 without an artificial bottom seal installed across the full width of the bottom of the door assembly during the test. The air leakage rate of the door assembly shall not exceed 3.0 cubic feet per minute per square foot [$\text{ft}^3/(\text{min} \times \text{ft}^2)$]($0.015424 \text{ m}^3/\text{s} \times \text{m}^2$) of door opening at 0.10 inch (24.9 Pa) of water column for both the ambient temperature and elevated temperature tests. Louvers shall be prohibited. Installation of smoke doors shall be in accordance with NFPA 405.~~

Commenter's Reason: We believe that this Public Comment which modifies the original code change proposal addresses the concerns expressed by the Committee and others during the code hearings held in Palm Springs, CA. The preferred way of achieving the necessary degree of smoke and draft control door protection for these fire service access elevator lobby doors is to provide direct reference to Section 715.4.3.1. Section 715.4.3.1 of the Supplement specifies the testing requirements for smoke and draft control door assemblies based on UL1784. The additional provision is included to address that the test method be performed without an artificial bottom seal installed across the full width of the bottom of the door assembly in order to measure the complete leakage rate for the door assembly on the assumption that leakage could occur under the bottom of the door in this application. This will assure that the doorways not only have an adequate fire protection rating for protecting the fire service access elevator lobbies but they will also protect against smoke intrusion into the lobby where the fire service will stage its operations before attacking a fire on the fire floor. This is a very important component of the overall protection package provided for the fire service access elevators.

Final Hearing Results

G196-07/08

AMPC1

Code Change No: **G197-07/08**

Original Proposal

Section: 3007.3.4 (New)

Proponent: Ken Kraus, Los Angeles Fire Department, CA

Add new text as follows:

3007.3.4 Lobby size. Each fire service access elevator lobby shall be a minimum of 150 square feet (14 m²) in area. The lobby shall increase in size by 50 square feet (4.65 m²) for each additional elevator car served.

Reason: The purpose of this change is to enhance the efficacy of provisions recently added to the IBC as G63-06/07.

Stipulating a minimum size for the fire service elevator lobby is essential to ensure the effectiveness of the intended use. Areas used as a basis for firefighting emergency operations must be able to accommodate; multiple fire attack teams, tactical equipment, practical use of the associated standpipe, and do not conform to standard occupancy factor calculations.

A minimum size is also necessary to ensure the effective utilization of the associated exit enclosure.

Without this change, design constraints, egress configuration limitations and other factors could dictate or limit the size of the lobby rendering it potentially useless.

Cost Impact: This code change proposal will increase the cost of construction.

Analysis: The 2007 Supplement includes a new section 3007, Fire Service Access Elevators. The requirement is scoped in Section 403.10.

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The committee felt it was a good idea to provide guidance on the size of the lobbies but there was a concern that the justification for the size of the area needed to be provided. There was added concern that the requirement may conflict with the exception to Section 3007.3.

Assembly Action:

None

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Ken Kraus, Los Angeles Fire Department, requests Approval as Modified by this public comment.

Modify proposal as follows:

3007.3.4 Lobby Size. Each enclosed fire service access elevator lobby shall be a minimum of 150 square feet (14 m²) in area with a minimum dimension of 8 feet (2440 mm). ~~The lobby shall increase in size by 50 square feet (4.65 m²) for each additional elevator car served.~~

Commenter's Reason: The word "enclosed" is inserted to address the concern of the Committee regarding creating conflict with Section 3007.3 (Supp), which exempts street level lobbies from the enclosure requirement.

Basis for the 150 Sq Ft.:

The Fire Service Access Elevator provisions exist to ensure the access and operational capabilities of firefighters in high-rise buildings greater than 120 feet in height. A minimum lobby size stipulation is necessary to make sure that the space provided is adequate for firefighters during emergencies.

Most Fire Departments operate with high-rise fire attack teams comprised of either 3 & 4 firefighters. The lobby should be large enough to accommodate 1 team preparing to enter the fire area (floor) and 1 team needing to withdraw from the fire area, while leaving access to the hoist-way and exit enclosure doors clear. On average this equates to 7 firefighters).

I used as a basis an occupancy factor of 15 (waiting area per Table 1004.1.1). I increased 15 by a factor of 1.5 to adjust for the additional space required for firefighters on-person and related equipment. (15 X 1.5 = 22.5)

My calculation of 7 firefighters @22.5 square feet per FF rendered a lobby size of 157.5 square feet. I rounded down to **150 square feet.**

Basis for the 8 feet minimum dimension:

My reason for requiring additional lobby size when additional cars are provided was to avoid a long narrow lobby that would compromise the 2-team scenario above. In lieu of increased size, I have added a minimum dimension component.

I subjected an accepted shoulder width allowance of 32 inches to a factor of 1.5, again due to the bulk of firefighters clothing and equipment, which resulted in 48 inches. To remain consistent with the 2-team scenario, I allowed each team a **4 foot** wide operating area, arriving at the **8 feet minimum dimension.**

The additional car increase is deleted.

Final Hearing Results

G197-07/08

AMPC

Code Change No: **G201-07/08**

Original Proposal

Sections: 3101.1, 3110 (New), Chapter 35 (New)

Proponent: Joseph R. Hetzel, PE, Thomas Associates, Inc., representing the Door & Access Systems Manufacturers Association

1. Revise as follows:

3101.1 Scope. The provisions of this chapter shall govern special building construction including membrane structures, temporary structures, pedestrian walkways and tunnels, automatic vehicular gates, awnings and canopies, marquees, signs, and towers and antennas.

2. Add new text as follows:

SECTION 3110 AUTOMATIC VEHICULAR GATES

3110.1 General. Automatic vehicular gates shall comply with the requirements of this section and other applicable sections of this code.

3110.2 Definitions. The following words and terms shall, for the purposes of this section and as used elsewhere in this code, have the meaning shown herein.

VEHICULAR GATE. A gate that is intended for use at a vehicular entrance or exit to a drive, parking lot or similar location, and that is not generally intended for use by pedestrian traffic.

3110.3 Vehicular gates intended for automation. Vehicular access gates intended for automation shall be designed, constructed and installed to comply with the requirements of ASTM F 2200.

3110.4 Vehicular gate openers. Vehicular gate openers, when provided, shall be listed in accordance with UL 325.

3. Add standards to Chapter 35 as follows:

ASTM

F 2200-05 Standard Specification for Automated Vehicular Gate Construction

UL

325-02 Door, Drapery, Gate, Louver, and Window Operators and Systems, with revisions through February, 2006

Reason: The purpose of the proposed code change is to provide requirements for automatic vehicular gates, which are not currently addressed in the Code. A set of companion changes was submitted for the International Fire Code, to harmonize that code with the IBC with respect to automated vehicular gates.

The current Code provisions are inadequate because public safety needs are not addressed regarding automatic operation of vehicular gates.

Protection is needed from potential entrapment of individuals between an automatically moving gate and a stationary object, or surface, in close proximity to such gate. Gates intended for automation require specific design, construction and installation to accommodate entrapment protection to minimize or eliminate certain excessive gate gaps, openings and protrusions identified as contributing to the hazard of entrapments that have historically caused numerous serious injuries and deaths.

The Code will be improved by including provisions referencing UL 325 and ASTM F 2200. UL 325 is an ANSI recognized safety standard containing provisions governing gate openers. Gate openers listed to the requirements of UL 325 provide the public with assurance that safety requirements have been met for such openers. ASTM F 2200 is a consensus document containing provisions governing the construction of vehicular gates intended for automation, and has been harmonized with the applicable provisions of UL 325.

Death and injury data does exist associated with automated vehicular gates. A previous related proposal on the topic, submitted in 2002 by the Consumer Product Safety Commission and designated as E34-02, pointed out the following information compiled by the CPSC from 1985 to that time:

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1. Reports of 32 deaths relating to automatically operated vehicular gates were received, many as a result of entrapment between a moving gate and a stationary object.
2. Data from the National Electronic Injury Surveillance System estimated that approximately 2,000 people are treated annually in hospital emergency rooms due to injuries in such gates. Many of these injuries have been identified as serious, involving amputation, broken arms and broken legs.

Cost Impact: The code change proposal will increase the cost of construction. However, the resulting safety benefits will outweigh the increased cost.

Public Hearing Results

Analysis: Review of proposed new standards ASTM F 2200-05 and UL325-02 indicated that, in the opinion of ICC Staff, the standards **did** comply with ICC standards criteria. Note that UL325 is already referenced in the IRC.

Committee Action:

Disapproved

Committee Reason: The provisions need to be limited to gates associated with buildings. Currently as written the proposal does not meet the scope and intent of the IBC.

Staff note: F70-07/08 contained a proposal with similar requirements for the IFC. That code change was Approved as Modified.

Assembly Action:

None

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Joseph R. Hetzel, PE, Thomas Associates, Inc., representing the Door & Access Systems Manufacturers Association, requests Approval as Modified by this public comment.

Modify proposal as follows:

3110.2 Definitions. The following words and terms shall, for the purposes of this section and as used elsewhere in this code, have the meaning shown herein.

VEHICULAR GATE. A gate that is intended for use at a vehicular entrance or exit to a ~~drive, parking lot or similar location~~ facility, building or portion thereof, and that is not ~~generally~~ intended for use by pedestrian traffic.

3110.3 Vehicular gates intended for automation. Vehicular ~~access~~ gates intended for automation shall be designed, constructed and installed to comply with the requirements of ASTM F 2200.

(Portions of the proposal not shown remain unchanged.)

Commenter's Reason: Replacing "drive, parking lot or similar location" with "facility, building or portion thereof" satisfies the Committee concern that the definition previously proposed for "Vehicular Gate" was too broad in scope with respect to the IBC. Deletion of the words "generally" and "access" are editorial.

Automated vehicular gates are often provided for use in facilities and buildings that incorporate vehicular access to parking in either lower floors, upper floors or adjacent structures. Multi-story commercial retail establishments, hotels, and multi-story residential structures are among the common applications.

Similar automated vehicular gate related language was approved for inclusion in the International Fire Code, via code change F70-07/08. The new IFC language applies to barricades and security gates across "fire apparatus access roads", defined in that code as providing "fire apparatus access from a fire station to a facility, building or portion thereof", and "inclusive of all other terms such as fire lane, public street, private street, parking lot lane and access roadway."

Final Hearing Results

G201-07/08

AMPC

Code Change No: **G203-07/08**

Original Proposal

Sections: 1613.3, 3401.4 (New) (IEBC [B] 301.2), 3401.4.1 (New) (IEBC [B] 301.2.1), 3401.4.2 (New) (IEBC [B] 301.2.2), 3403 (New) (IEBC [B] 302), 3404 (New) (IEBC [B] 303), 3405 (New) (IEBC [B] 304)

Proponent: David Bonowitz, S.E, David Bonowitz, SE, representing the National Council of Structural Engineers Associations Existing Buildings

THESE PROPOSALS ARE ON THE AGENDA OF THE IBC STRUCTURAL AND THE IBC MEANS OF EGRESS CODE DEVELOPMENT COMMITTEES AS 2 SEPARATE CODE CHANGES. SEE THE TENTATIVE HEARING ORDER FOR THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE.

PART I – IBC STRUCTURAL

1. Revise as follows:

1613.3 Existing buildings. Additions, alterations, ~~modification,~~ repairs or change of occupancy of existing buildings shall be in accordance with ~~Sections 3403.2.3 and 3406.4~~ Chapter 34.

2. Add new text as follows:

3401.4 (IEBC 301.2) Building materials. Building materials shall comply with the requirements of this section.

3401.4.1 (IEBC 301.2.1) Existing materials. Materials already in use in a building in conformance with requirements or approvals in effect at the time of their erection or installation shall be permitted to remain in use unless determined by the code official to be detrimental to life, health or safety.

3401.4.2 (IEBC 301.2.2) New and replacement materials. Except as otherwise required or permitted by this code, materials permitted by the applicable code for new construction shall be used. Like materials shall be permitted for repairs and alterations, provided no hazard to life, health or property is created. Hazardous materials shall not be used where the code for new construction would not permit their use in buildings of similar occupancy, purpose and location.

3. Delete section in its entirety and substitute follows:

~~SECTION 3403 (IEBC 302) ADDITIONS, ALTERATIONS OR REPAIRS~~

SECTION 3403 (IEBC 302) ADDITIONS

3403.1 (IEBC 302.1) General. Additions to any building or structure shall comply with the requirements of the code for new construction. Alterations to the existing building or structure shall be made to ensure that the existing building or structure together with the addition are no less conforming with the provisions of this code than the existing building or structure was prior to the addition. An existing building together with its additions shall comply with the height and area provisions of Chapter 5.

3403.2 (IEBC 302.2) Flood hazard areas. For buildings and structures in flood hazard areas established in Section 1612.3, any addition that constitutes substantial improvement of the existing structure, as defined in Section 1612.2, shall comply with the flood design requirements for new construction, and all aspects of the existing structure shall be brought into compliance with the requirements for new construction for flood design.

3403.3 (IEBC 302.3) Existing structural elements carrying gravity load. Any existing gravity load-carrying structural element for which an addition and its related alterations cause an increase in design gravity load of more than 5 percent shall be strengthened, supplemented, replaced, or otherwise altered as needed to carry the increased load required by this code for new structures. Any existing gravity load-carrying structural element whose

gravity load-carrying capacity is decreased shall be considered an altered element subject to the requirements of Section 3404.3. Any existing element that will form part of the lateral load path for any part of the addition shall be considered an existing lateral load-carrying structural element subject to the requirements of Section 3403.4.

3403.3.1 (IEBC 302.3.1) Design live load. Where the addition does not result in increased design live load, existing gravity load-carrying structural elements shall be permitted to be evaluated and designed for live loads approved prior to the addition. If the approved live load is less than that required by Section 1607, the area designed for the non-conforming live load shall be posted with placards of approved design indicating the approved live load. Where the addition does result in increased design live load, the live load required by Section 1607 shall be used.

3403.4 (IEBC 302.4) Existing structural elements carrying lateral load. Where the addition is structurally independent of the existing structure, existing lateral load-carrying structural elements shall be permitted to remain unaltered. Where the addition is not structurally independent of the existing structure, the existing structure and its addition acting together as a single structure shall be shown to meet the requirements of Sections 1609 and 1613.

Exception: Any existing lateral load-carrying structural element whose demand-capacity ratio with the addition considered is no more than 10 percent greater than its demand-capacity ratio with the addition ignored shall be permitted to remain unaltered. For purposes of calculating demand-capacity ratios, the demand shall consider applicable load combinations with design lateral loads or forces per Sections 1609 and 1613. For purposes of this Exception, comparisons of demand-capacity ratios and calculation of design lateral loads, forces, and capacities shall account for the cumulative effects of additions and alterations since original construction.

SECTION 3404 (IEBC 303) **ALTERATIONS**

3404.1 (IEBC 303.1) General. Except as provided by Section 3401.4 or this section, alterations to any building or structure shall comply with the requirements of the code for new construction. Alterations shall be such that the existing building or structure is no less conforming with the provisions of this code than the existing building or structure was prior to the alteration.

3404.2 (IEBC 303.2) Flood hazard areas. For buildings and structures in flood hazard areas established in Section 1612.3, any alteration that constitutes substantial improvement of the existing structure, as defined in Section 1612.2, shall comply with the flood design requirements for new construction, and all aspects of the existing structure shall be brought into compliance with the requirements for new construction for flood design.

3404.3 (IEBC 303.3) Existing structural elements carrying gravity load. Any existing gravity load-carrying structural element for which an alteration causes an increase in design gravity load of more than 5 percent shall be strengthened, supplemented, replaced, or otherwise altered as needed to carry the increased gravity load required by this code for new structures. Any existing gravity load-carrying structural element whose gravity load-carrying capacity is decreased as part of the alteration shall be shown to have the capacity to resist the applicable design gravity loads required by this code for new structures.

3404.3.1 (IEBC 303.3.1) Design live load. Where the alteration does not result in increased design live load, existing gravity load-carrying structural elements shall be permitted to be evaluated and designed for live loads approved prior to the alteration. If the approved live load is less than that required by Section 1607, the area designed for the non-conforming live load shall be posted with placards of approved design indicating the approved live load. Where the alteration does result in increased design live load, the live load required by Section 1607 shall be used.

3404.4 (IEBC 303.4) Existing structural elements carrying lateral load. Except as permitted by Section 3404.5, where the alteration increases design lateral loads per Section 1609 or Section 1613, or where the alteration results in a structural irregularity as defined in ASCE 7, or where the alteration decreases the capacity of any existing lateral load-carrying structural element, the structure of the altered building or structure shall be shown to meet the requirements of Sections 1609 and 1613.

Exception: Any existing lateral load-carrying structural element whose demand-capacity ratio with the alteration considered is no more than 10 percent greater than its demand-capacity ratio with the alteration ignored shall be permitted to remain unaltered. For purposes of calculating demand-capacity ratios, the demand shall consider applicable load combinations with design lateral loads or forces per Sections 1609 and 1613. For purposes of this exception, comparisons of demand-capacity ratios and calculation of design lateral loads, forces, and capacities shall account for the cumulative effects of additions and alterations since original construction.

3404.5 (IEBC 303.5) Voluntary seismic improvements. Alterations to existing structural elements or additions of new structural elements that are not otherwise required by this chapter and are initiated for the purpose of improving the performance of the seismic force-resisting system of an existing structure or the performance of seismic bracing or anchorage of existing nonstructural elements shall be permitted, provided that an engineering analysis is submitted demonstrating the following:

1. The design strength of existing structural elements required to resist seismic forces is not reduced.
2. The seismic force to required existing structural elements is not increased beyond their design strength.
3. New structural elements are detailed and connected to the existing structural elements as required by Chapter 16.
4. New or relocated nonstructural elements are detailed and connected to existing or new structural elements as required by Chapter 16.
5. The alterations do not create a structural irregularity as defined in ASCE 7 or make an existing structural irregularity more severe.
6. The alterations do not result in the creation of an unsafe condition.

SECTION 3405 (IEBC 304) **REPAIRS**

3405.1 (IEBC 304.1) General. Buildings and structures, and parts thereof, shall be repaired in conformance with Section 3401.2. Work on non-damaged components that is necessary for the required repair of damaged components shall be considered part of the repair and shall not be subject to the requirements for alterations in this chapter.

3405.2 (IEBC 304.2) Flood hazard areas. For buildings and structures in flood hazard areas established in Section 1612.3, any repair that constitutes substantial improvement of the existing structure, as defined in Section 1612.2, shall comply with the flood design requirements for new construction, and all aspects of the existing structure shall be brought into compliance with the requirements for new construction for flood design.

(Renumber subsequent sections)

PART II – IBC MEANS OF EGRESS

Add exceptions to proposed new Section 3404.1 (see above) as follows:

Exceptions:

1. An existing stairway shall not be required to comply with the requirements of Section 1009 where the existing space and construction does not allow a reduction in pitch or slope.
2. Handrails otherwise required to comply with Section 1009.10 shall not be required to comply with the requirements of Section 1012.5 regarding full extension of the handrails where such extensions would be hazardous due to plan configuration.

Reason: The proposal is entirely editorial (with one exception regarding clarification of wind design triggers, described below) and is intended to clarify and correct inconsistencies in section 3403 by breaking it into separate sections, defining certain terms, and removing obsolete, unnecessary, and unenforceable provisions. The proposal does not change the intended scope of the section or the intended outcome of the work. That is, the basic philosophy of Chapter 34, which requires upgrades beyond the intended scope of work in rare cases only, is maintained.

The proposal does the following:

- Adds a section on permitted materials to replace unenforceable and incomplete provisions in current 3403.2 and 3403.3 and to incorporate the new provision from the 07 supplement in current section 3403.1.1.
- Separates 3403 into separate sections for Additions, Alterations, and Repairs in order to clarify different requirements and facilitate future code changes.
- Clarifies that the structural trigger for evaluation of wind loading should be a 10% trigger (as it is for earthquake loading), not the 5% trigger implied from the current non-specific language in section 3403.2.

CODE CHANGES RESOURCE COLLECTION – INTERNATIONAL BUILDING CODE

The following table documents the proposed change in section numbering in order to facilitate review:

2006 IBC section	Proposed section(s)
3403.1 Existing buildings or structures	3403.1, 3404.1
3403.1.1 Existing approved materials (added with 07 supplement)	3401.4.1
3403.1.2 Flood hazard areas (3403.1.1 prior to 07 supplement)	3403.2, 3404.2, 3405.2
3403.2 Structural	3403.3, 3404.3 3401.4.1, 3405.1 (these replace the last sentence of 3403.2)
3403.2.1 Existing live load	3403.3.1
3403.2.2 Live load reduction	3403.3.1
3403.2.3 Seismic	3403.4, 3404.4
3403.2.3.1 Additions to existing buildings	3403.4
3403.2.3.2 Alterations	3404.4
3403.2.3.2 Alterations – Exception	3404.5
3403.3 Nonstructural	3401.4
3403.4 Stairways (including 3403.4.1, added with 07 supplement)	Exceptions to 3404.1

Overall, the proposal is necessary and justified because of obsolete and inconsistent provisions. Examples:

- Current provisions are difficult to enforce because they use implicit, not explicit, wording. That is, they say only what is not allowed but are not clear as to what is required as an allowed alternative. Section 3403.1, for example, says an alteration may not cause the existing building to be in violation. What if the intended alteration – removal of a doorway, for example – *would* cause a violation? The implication is that additional or compensating work must be performed to maintain the same level of compliance as the existing condition. But that implication is contradicted by the final sentence of 3403.1, which limits the extent of triggered work. The result is an unclear provision with an unintended limitation on building alterations and an unclear scope of required work. Similar examples exist with respect to the structural and seismic triggers in 3403.2.
- The scope of current section 3403.2 is unclear. There's a separate subsection regarding seismic design, but no similar subsection for wind. Is wind excluded, or is wind presumed to be covered by current 3403.2, with a 5% trigger?
- Current section 3403.2 is non-rational in that it requires full compliance of the entire structure if even a single existing element is overstressed or weakened. Full compliance is often impossible to achieve. The proposed wording allows an element-by-element check, which was probably the unstated intent of the current provision.
- Existing wording is incomplete, incorrect, or unenforceable. For example, section 3403 is supposed to cover additions, alterations, and repairs, but there is only one sentence about repairs (the last sentence of 3403.2), and it is unenforceable. References are made to ASCE 7 that should more properly be made to Chapter 16. 3403.2.3 purports to cover change of occupancy, in contradiction to 3406. See below for other examples.

Each of the various changes is justified and explained separately:

Proposed 3401.4: Replaces incomplete and unenforceable language in 3403.2 and 3403.3 and states more clearly the intent of the chapter to allow existing materials except in certain conditions. Since these requirements cover a basic code philosophy that should apply to change of occupancy and to historic buildings as well as to additions, alterations, and repairs, these should be moved from current 3403 to a more general section covering the entire chapter. Existing materials and new materials are treated separately for clarity. Wording for existing materials already in place is from current 3403.1.1, added with the 07 supplement. Wording for new materials is borrowed from IEBC 501.2 and 502.1.

Section 3403 for Additions only: Portions of current 3403.1 relevant to additions are retained, largely unchanged.

- Some requirements are changed from implicit to explicit.
- "No less conforming" language is borrowed from IEBC 501.3.
- No change to the Flood provision.
- Current 3403.2 (which per 1613.3 is not intended to apply to seismic force resisting systems) and 3403.2.3 are reorganized to apply to different parts of the structural system: gravity and lateral. The provision for the gravity system, proposed 3403.3, retains the current 5% trigger. The lateral system provision, 3403.4, retains the distinction between independent and non-independent additions, retains the 10% element trigger, and clarifies that wind loads must be considered as well as seismic (as intended by current 3403.2).
- The two conditions in current 3403.2.3.1 are rewritten as an exception to proposed 3403.4. To eliminate a loophole by which a 9% increase in load would be allowed even with a simultaneous 9% decrease in capacity, the provision is written in terms of demand-capacity ratio to reflect the actual intent of a trigger based on 10% total change.
- Current 3403.2.1 and 3403.2.2 are combined into 3403.3.1 with no change in intent, but with an explicit requirement added for cases previously covered by unenforceable "public safety not endangered thereby" clause, such as conversion of office space into an exit corridor to serve the addition. Also, the current 3403.2.2 uses the term "live load reduction" incorrectly; "non-conforming live load" is proposed instead. ("Live load reduction" is a structural provision – 1607.9 – that has to do with the probability of uniform loading. It is not what is intended by this provision.)
- References to ASCE 7 are changed to refer to Chapter 16. This is the more appropriate reference because Chapter 16 makes (or could make) certain changes to ASCE 7 that should be considered.

Section 3404 for Alterations only: Portions of current 3403.1 relevant to alterations are retained, largely unchanged.

- Reference to proposed 3401.4 allows the use of like materials.
- Some requirements are changed from implicit to explicit.
- "No less conforming" language is borrowed from IEBC 501.3.
- No change to the Flood provision.
- Current 3403.2 and 3403.2.3 are reorganized similar to Additions.
- Current 3403.2.1 and 3403.2.2 are combined and corrected as for Additions.
- Current 3403.4 and 3403.4.1 regarding stairway alterations are relocated as exceptions to the general requirement of 3404.1.
- References to ASCE 7 are changed to refer to Chapter 16, as for Additions.

Section 3405 for Repairs only: Separated to distinguish from other work scopes.

- Proposed 3405.1 cites 3401.2, which gives the owner's requirement to maintain the building and the code official's authority to require repairs, as an explicit provision.

- Because of the split into separate sections for repair and alteration, proposed 3405.1 now clarifies that work undertaken for purposes of repair is not intended to invoke the upgrade triggers for voluntary alterations.
- No change to the Flood provision.
- As in current Chapter 34, repairs do not trigger any upgrades.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

PART I – IBC STRUCTURAL

Committee Action:

Approved as Submitted

Committee Reason: The committee agrees that reformatting these IBC sections on alterations, additions and repairs provides a badly needed code clarification of the existing building provisions in Chapter 34.

Assembly Action:

None

PART II – IBC MEANS OF EGRESS

Committee Action:

Approved as Submitted

Committee Reason: The proposed language is necessary for existing stairways undergoing alterations.

Assembly Action:

None

Final Hearing Results

G203-07/08, Part I	AS
G203-07/08, Part II	AS

Code Change No: G204-07/08

Original Proposal

Section: 3401.4 (New)

Proponent: David Bonowitz, SE, representing the National Council of Structural Engineers Associations Existing Buildings Committee

Add new text as follows:

3401.4 Alternative compliance. *Work performed in accordance with the International Existing Building Code shall be deemed to comply with the provisions of this chapter.*

Reason: To allow an approach to existing buildings that is already part of the I-codes family.

The IEBC takes a more comprehensive approach to existing buildings than IBC chapter 34. In particular, the Work Area method in IEBC chapters 4-12 uses a more specific and clearer set of upgrade triggers and design criteria than does current IBC section 3403, and it adopts current reference standards such as *ASCE 31* for the seismic evaluation of existing buildings and allows the ICC's *Guidelines for the Seismic Retrofit of Existing Buildings* (IEBC Appendix A). Also, by allowing these reference standards, the IBC would be in greater compliance with FEMA rules in 44CFR 206.226(d), which note that repairs using criteria for new construction are often unreasonable and generally less acceptable than repairs based on criteria developed for existing buildings. The IEBC has been through two full code cycles and is adopted in part or in full by jurisdictions across the country. It is a reasonable and valuable alternative to Chapter 34.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The proposal appropriately gives recognition to the IEBC as a viable design tool. The reference to the IEBC is simply recognized as a compliance option for existing buildings.

Assembly Action:

None

Final Hearing Results

G204-07/08

AS

Code Change No: **G205-07/08**

Original Proposal

Sections: 3402 (IEBC 202), 3403.2 (IEBC [B] 302.2)

Proponent: Gary R. Searer, PE, SE, Wiss, Janney, Elstner Associates, Inc., representing himself

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE.

1. Add new text as follows:

**SECTION 3402 (IEBC 202)
DEFINITIONS**

DANGEROUS. Any building or structure or portion thereof that meets any of the conditions described below shall be deemed dangerous:

1. The building or structure has collapsed, partially collapsed, moved off its foundation, or lacks the support of any portion of ground necessary to support it.
2. There exists a significant risk of collapse, detachment, or dislodgment of any portion, member, appurtenance, or ornamentation of the building or structure under typical day-to-day service loads.

2. Revise as follows:

3403.2 (IEBC [B] 302.2) Structural. Additions or alterations to an existing structure shall not increase the force in any structural element by more than 5 percent, unless the increased forces on the element are still in compliance with the code for new structures, nor shall the strength of any structural element be decreased to less than that required by this code for new structures. Where repairs are made to structural elements of an existing building, and uncovered structural elements are found dangerous, such dangerous conditions shall be mitigated or made safe to the satisfaction of the code official. ~~to be unsound or otherwise structurally deficient, such elements shall be made to conform to the requirements for new structures.~~

Reason: The existing wording of Section 3403.2 contains two undefined terms (“unsound” and “structurally deficient”) one of which is not particularly meaningful and one of which that can have multiple common meanings to engineers. This proposal replaces these two undefined terms with a term from the IEBC in an attempt to clarify the intent and meaning of this Section and to bring the Section into better alignment with the IEBC.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

This code change was heard by the IBC Structural Code Development Committee.

Committee Action:

Approved as Modified

Modify the proposal as follows:

**SECTION 3402 (IEBC 202)
DEFINITIONS**

DANGEROUS. Any building or structure or portion thereof that meets any of the conditions described below shall be deemed dangerous:

1. The building or structure has collapsed, partially collapsed, moved off its foundation, or lacks the support of ~~any portion of~~ ground necessary to support it.
2. There exists a significant risk of collapse, detachment or dislodgment of any portion, member, appurtenance or ornamentation of the building or structure under ~~typical day-to-day~~ service loads.

3403.2 (IEBC [B] 302.2) Structural. Additions or alterations to an existing structure shall not increase the force in any structural element by more than 5 percent, unless the increased forces on the element are still in compliance with the code for new structures, nor shall the strength of any structural element be decreased to less than that required by this code for new structures. Where repairs are made to structural elements of an existing building, and uncovered structural elements are found to be dangerous, such dangerous conditions shall be eliminated ~~mitigated or made safe to the satisfaction of the code official.~~

Committee Reason: The committee agrees that adding a definition of the term “dangerous” will clarify the intent of the IBC existing building provisions. The modifications remove unnecessary or unclear wording and they are consistent with actions by the IEBC committee.

Assembly Action:

None

Final Hearing Results

G205-07/08

AM

Code Change No: G206-07/08

Original Proposal

Sections: 3403 (IEBC [B] 302), 3403.1.1(IEBC [B] 302.1.1), 3403.2 (IEBC [B] 302.2), 3404 (New) (IEBC [B] 303 (New))

THIS CODE CHANGE WILL BE HEARD ON THE IBC STRUCTURAL PORTION OF THE HEARING ORDER.

Proponent: David Bonowitz, SE, representing the National Council of Structural Engineers Associations Existing Buildings Committee

1. Revise as follows:

**SECTION 3403 (IEBC [B] 302)
ADDITIONS, AND ALTERATIONS ~~OR REPAIRS~~**

3403.1.1 (IEBC [B] 302.1.1) Flood hazard areas. For buildings and structures in flood hazard areas established in Section 1612.3, any additions, ~~or~~ alterations ~~or repairs~~ that constitute substantial improvement of the existing structure, as defined in Section 1612.2, shall comply with the flood design requirements for new construction, and all aspects of the existing structure shall be brought into compliance with the requirements for new construction for flood design.

3403.2 (IEBC [B] 302.2) Structural. Additions or alterations to an existing structure shall not increase the force in any structural element by more than 5 percent, unless the increased forces on the element are still in compliance with the code for new structures, nor shall the strength of any structural element be decreased to less than that required by this code for new structures. ~~Where repairs are made to structural elements of an existing building, and uncovered structural elements are found to be unsound or otherwise structurally deficient, such elements shall be made to conform to the requirements for new structures.~~

3403.3 (IEBC [B] 302.3) (Supp) Nonstructural. Nonstructural alterations ~~or repairs~~ to an existing building or structure are permitted to be made of the same materials of which the building or structure is constructed, provided that they do not adversely affect any structural member or the fire-resistance rating of any part of the building or structure.

The work shall not make the building less conforming to the building, plumbing, mechanical, electrical or fire codes of the jurisdiction, or to alternative materials, design and methods of construction, or to any previously approved plans, modifications, alternative methods, or compliance alternatives, than it was before the alteration repair was undertaken.

2. Add new text as follows:

SECTION 3404 (IEBC [B] 303)
REPAIRS

3404.1 [IEBC 303.1] General. Buildings and structures, and parts thereof, shall be repaired in conformance with this section and with Section 3401.2. Work on non-damaged components that is necessary for the required repair of damaged components shall be considered part of the repair and shall not be subject to the requirements for alterations in this chapter. Routine maintenance required by section 3401.2, ordinary repairs exempt from permit per Section 105.2, and abatement of wear due to normal service conditions shall not be subject to the requirements for repairs in this section.

3404.1.1 [IEBC 303.1.1] Dangerous conditions. Regardless of the extent of structural or nonstructural damage, the code official shall have the authority to require the elimination of conditions deemed dangerous.

3404.2 [IEBC 303.2] Substantial structural damage to vertical elements of the lateral-force-resisting system. A building that has sustained substantial structural damage to the vertical elements of its lateral-force-resisting system shall be evaluated and repaired in accordance with the applicable provisions of Sections 3404.2.1 through 3404.2.3.

3404.2.1 [IEBC 303.2.1] Evaluation. The building shall be evaluated by a registered design professional, and the evaluation findings shall be submitted to the code official. The evaluation shall establish whether the damaged building, if repaired to its pre-damage state, would comply with the provisions of this code for wind and earthquake loads. Evaluation for earthquake loads shall be required if the substantial structural damage was caused by or related to earthquake effects or if the building is in Seismic Design Category C, D, E, or F.

Wind loads for this evaluation shall be those prescribed in Section 1609. Earthquake loads for this evaluation, if required, shall be permitted to be seventy-five percent of those prescribed in Section 1613. Values of R , Ω_0 , and C_d for the existing seismic force-resisting system shall be those specified by this code for an Ordinary system unless it is demonstrated that the existing system will provide performance equivalent to that of an Intermediate or Special system.

3404.2.2 [IEBC 303.2.2] Extent of repair for compliant buildings. If the evaluation establishes compliance of the pre-damage building in accordance with Section 3404.2.1, then repairs shall be permitted that restore the building to its pre-damage state using materials and strengths that existed prior to the damage.

3404.2.3 [IEBC 303.2.3] Extent of repair for noncompliant buildings. If the evaluation does not establish compliance of the pre-damage building in accordance with Section 3404.2.1, then the building shall be rehabilitated to comply with applicable provisions of this code for load combinations, including wind or seismic loads. The wind loads for the repair shall be as required by the building code in effect at the time of original construction, unless the damage was caused by wind, in which case the wind loads shall be as required by the code in effect at the time of original construction or as required by this code, whichever are greater. Earthquake loads for this rehabilitation design shall be those required for the design of the pre-damage building, but not less than seventy-five percent of those prescribed in Section 1613. New structural members and connections required by this rehabilitation design shall comply with the detailing provisions of this code for new buildings of similar structure, purpose and location.

3404.3 [IEBC 303.3] Substantial structural damage to gravity load-carrying components. Gravity load-carrying components that have sustained substantial structural damage shall be rehabilitated to comply with the applicable provisions of this code for dead and live loads. Snow loads shall be considered if the substantial structural damage was caused by or related to snow load effects. Existing gravity load-carrying structural elements shall be permitted to be designed for live loads approved prior to the damage. Non-damaged gravity load-carrying components that receive dead, live, or snow loads from rehabilitated components shall also be rehabilitated or shown to have the capacity to carry the design loads of the rehabilitation design. New structural members and connections required by this rehabilitation design shall comply with the detailing provisions of this code for new buildings of similar structure, purpose and location.

3404.3.1 [IEBC 303.3.1] Lateral force-resisting elements. Regardless of the level of damage to vertical elements of the lateral force-resisting system, if substantial structural damage to gravity load-carrying components was caused primarily by wind or earthquake effects, then the building shall be evaluated in accordance with Section 3404.2.1 and, if noncompliant, rehabilitated in accordance with Section 3404.2.3.

3404.4 [IEBC 303.4] Less than substantial structural damage. For damage less than substantial structural damage, repairs shall be allowed that restore the building to its pre-damage state using materials and strengths that existed prior to the damage. New structural members and connections used for this repair shall comply with the detailing provisions of this code for new buildings of similar structure, purpose and location.

3404.5 [IEBC 303.5] Flood hazard areas. For buildings and structures in flood hazard areas established in Section 1612.3, any repair that constitutes substantial improvement of the existing structure, as defined in Section 1612.2, shall comply with the flood design requirements for new construction, and all aspects of the existing structure shall be brought into compliance with the requirements for new construction for flood design.

(Renumber subsequent sections)

3. Add new definition as follows:

SUBSTANTIAL STRUCTURAL DAMAGE. A condition where:

1. In any story, the vertical elements of the lateral force-resisting system have suffered damage such that the lateral load-carrying capacity of the structure in any horizontal direction has been reduced by more than 20 percent from its pre-damage condition; or
2. The capacity of any vertical gravity load-carrying component, or any group of such components, that supports more than 30 percent of the total area of the structure's floor(s) and roof(s) has been reduced more than 20 percent from its pre-damage condition and the remaining capacity of such affected elements, with respect to all dead and live loads, is less than 75 percent of that required by this code for new buildings of similar structure, purpose and location.

Reason: To provide reasonable requirements for building improvements in the interest of public safety and within the intent of the building code.

The proposal does the following:

- Defines Substantial Structural Damage to capture conditions of severe or widespread damage, as opposed to local effects or member distress, and to distinguish the damage requiring structural upgrade from damage to architectural and mechanical components.
- Separates repairs from current Section 3403 for clarity. (This is a nominal editorial revision, as repairs are scarcely mentioned in Section 3403 despite the current title of that section.)
- Creates a new Section 3404 with a logical method for evaluating damage and identifying cases where upgrade is warranted. The logic and language is based on IEBC Section 506.2, with certain editorial clarifications.

Chapter 34 currently requires structural improvements meeting “the code for new structures” in certain cases of additions, alterations, and changes of occupancy. It does not, however, require any improvements in the event of damage due to fire, structural overload, settlement, natural hazard, or any other cause, no matter how extensive or disproportionate the damage. This proposal identifies conditions of damage that should warrant improvements to the structural system for purposes of increasing safety and limiting attrition from the existing building stock.

In doing so, the proposal retains Chapter 34’s basic philosophy that triggered structural upgrades should be relatively rare. With this proposal, structural upgrade would be triggered only upon substantial structural damage to the lateral system, and only when evaluation shows that the pre-damage building was sub-standard. “Reduced” earthquake loads, a concept from the IEBC long in use in California and consistent with FEMA standards, are used both for evaluation and any required seismic rehabilitation to recognize that existing buildings should not be expected to perform as well as newer buildings.

Structural upgrade remains *not* required for:

- Architectural damage
- Equipment and other nonstructural damage
- Any structural damage less than “substantial”
- Any structural damage that does not affect the lateral system, except in rare cases of extreme non-conformance.
- Any building adequate for current wind loads and “reduced” seismic loads, even if damage was substantial.

The proposal’s language borrows heavily from the 2006 IEBC. The IEBC has been through two full code cycles and is adopted in part or in full by jurisdictions across the country.

Additional explanatory notes:

- The proposed definition of substantial structural damage is from IEBC Chapter 2.
- Proposed Section 3404 mirrors IEBC Section 506.2, with two substantive changes: 1) the addition of snow loads in proposed Section 3404.3 and 2) the limitation on seismic evaluation and upgrade for SDC A and B in proposed Section 3404.2.1.
- Proposed Section 3404.1 clarifies that proposed Section 3404.2 does not limit the code official’s discretion with respect to dangerous conditions.
- Proposed Section 3404.2.1 refers to Section 1613 for earthquake loads and limits the selection of design parameters. Section 1613 requires the engineer to identify the seismic force-resisting system of the existing building. In many cases, the existing building will not possess the detailing necessary to qualify for “Special” or even “Intermediate” systems. If the detailing is unknown, design parameters for “Ordinary” systems must be used. The language proposed is based on similar language in IEBC Section 506.1.1.2.
- Wording from IEBC Section 506.1.2 is modified to remove the bright line that the 2006 IEBC uses to distinguish when design parameters for Ordinary systems are needed. Rather than require strict compliance with the “proportioning and detailing requirements” of Intermediate or Special systems, general equivalence, similar to that contemplated by IBC Section 3406.4 is preferable because for many existing buildings there are no applicable provisions to check against. Also, “equivalent performance” preserves some engineering and regulatory discretion appropriate to work with existing buildings.
- Wording from IEBC Section 506.2 is modified by using “gravity load” as opposed to “vertical load” in order to avoid confusion over the term “vertical load-carrying component”.
- The flood provision in proposed Section 3404.5 is identical to the existing provision in current Section 3403.1.1.

CODE CHANGES RESOURCE COLLECTION – INTERNATIONAL BUILDING CODE

Note to ICC: NCSEA and SEAOC have separately proposed a broad reorganization of current Section 3403. If Section 3403 is reorganized per that proposal, the revisions proposed here to current Section 3403 will be unnecessary, and the text proposed here as new Section 3404 would be incorporated into proposed Section 3405.

Cost Impact: The code change proposal will not increase the cost of new construction. It might increase the cost of rare but already extensive repairs after one damaging event, but if it does, it will also reduce the cost of repairs in subsequent events.

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The committee opposes the proposed triggers in the definition of substantial structural damage. No study was provided on the cost-benefits of mitigation.

Assembly Action:

Approved as Submitted

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because an assembly action was successful.

Final Hearing Results

G206-07/08

AS

Code Change No: **G208-07/08**

Original Proposal

Sections: 3403.1.2 (IEBC [B] 302.1.2) (New)

Proponent: Jerry R. Tepe, FAIA, JRT-AIA Architect, representing the American Institute of Architects

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE.

Add new text as follows:

3403.1.2 [IEBC [B] 302.1.2] Flood hazard areas. For buildings and structures in flood hazard areas established in Section 1612.3, any additions, alterations or repairs that do not constitute substantial improvement or substantial damage of the existing structure, as defined in Section 1612.2, are not required to comply with the flood design requirements for new construction.

Reason: Although it is clear in Section 1612 that additions, alterations and/or repairs that do not constitute substantial improvements or restoration of substantial damage are not required to comply with the requirements for new construction as regards flood resistant construction (see attached IBC Committee Interpretation 42-06), the first sentence of 3403.1 is being used to force flood resistant design and construction. The argument goes further stating that 3403.1 confirms this and also requires the balance of the building to be brought into compliance when the scope exceeds the level of substantial improvement as an exception to the last sentence in 3403.1. Adding the proposed subsection will clarify the intent of the code.

SECTION 1612.1
IBC Interpretation No. 42-06
2006 Edition
Issued: 12-08-2006

1612.1 General. Within flood hazard areas as established in Section 1612.3, all new construction of buildings, structures and portions of buildings and structures, including substantial improvements and restoration of substantial damage to buildings and structures, shall be designed and constructed to resist the effects of flood hazards and flood loads. For buildings that are located in more than one flood hazard area, the provisions associated with the most restrictive flood hazard area shall apply.

REFERENCED SECTIONS:

1612.2 Definitions. The following words and terms shall, for the purposes of this section, have the meanings shown herein.

EXISTING CONSTRUCTION. Any buildings and structures for which the “start of construction” commenced before the effective date of the community’s first flood plain management code, ordinance or standard. “Existing construction” is also referred to as “existing structures.”

EXISTING STRUCTURE. See “Existing construction.”

SUBSTANTIAL IMPROVEMENT. Any repair, reconstruction, rehabilitation, addition or improvement of a building or structure, the cost of which equals or exceeds 50 percent of the market value of the structure before the improvement or repair is started. If the structure has sustained substantial damage, any repairs are considered substantial improvement regardless of the actual repair work performed. The term does not, however, include either:

1. Any project for improvement of a building required to correct existing health, sanitary or safety code violations identified by the building official and that are the minimum necessary to assure safe living conditions.
2. Any project for improvement of a building required to correct existing health, sanitary or safety code violations identified by the building official and that are the minimum necessary to assure safe living conditions.. Any alteration of a historic structure provided that the alteration will not preclude the structure’s continued designation as a historic structure.

1612.3 Establishment of flood hazard areas. To establish flood hazard areas, the governing body shall adopt a flood hazard map and supporting data. The flood hazard map shall include, at a minimum, areas of special flood hazard as identified by the Federal Emergency Management Agency in an engineering report entitled “The Flood Insurance Study for [INSERT NAME OF JURISDICTION],” dated [INSERT DATE OF ISSUANCE], as amended or revised with the accompanying Flood Insurance Rate Map (FIRM) and Flood Boundary and Floodway Map (FBFM) and related supporting data along with any revisions thereto. The adopted flood hazard map and supporting data are hereby adopted by reference and declared to be part of this section.

Q: An existing building constructed prior to the effective date established in Section 1612.3 is located within a flood hazard area. Is an addition (to the existing building) that is not defined as a substantial improvement required to comply with the provisions of Section 1612.1 of the *International Building Code* for new construction?

A: No. The provisions in Section 1612.1 apply only to new construction to the extent indicated. As defined in Section 1612.2 of the *International Building Code*, a structure constructed prior to the effective date established in Section 1612.3 is considered an existing structure. Additions (improvements) to an existing building that does not equal or exceed 50 percent of the market value of the existing structure before the improvement is not a substantial improvement and is not required to comply with the provisions of Section 1612.1 for the effects of flood hazards and flood loads.

Cost Impact: Correct enforcement of the code will save costs.

Analysis: The referenced committee interpretation is limited to “existing buildings constructed prior to the effective date established in Section 1612.3”, and is not applicable to all existing buildings.

Public Hearing Results

This code change was heard by the IBC Structural Code Development Committee.

Committee Action:

Approved as Submitted

Committee Reason: The new section clarifies that existing buildings only need to comply with flood design for new construction when the conditions under “substantial improvement” are met.

Assembly Action:

None

Final Hearing Results

G208-07/08

AS

Code Change No: **G209-07/08**

Original Proposal

Sections: 3403.2.3 (IEBC [B] 302.2.3), 3403.2.3.1 (IEBC [B] 302.2.3.1), 3403.2.3.2 (IEBC [B] 302.2.3.2), 3406.4; IEBC 506.1.1.2, 506.1.1.3

Proponent: David Bonowitz, SE, representing the National Council of Structural Engineers Associations Existing Buildings Committee

THESE PROPOSALS ARE ON THE AGENDA OF THE IBC STRUCTURAL AND IEBC CODE DEVELOPMENT COMMITTEES AS 2 SEPARATE CODE CHANGES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IBC STRUCTURAL

Revise as follows:

3403.2.3 (IEBC[B] 302.2.3) Seismic. ~~Seismic requirements for additions and, alterations or modification or change of occupancy of existing buildings shall be in accordance with this section for the purposes of seismic considerations. Values of R , Ω_o , and C_d for the existing seismic force-resisting system shall be those specified by this code for an Ordinary system unless it is demonstrated that the existing system will provide performance equivalent to that of an Intermediate or Special system.~~

3403.2.3.1 (IEBC [B] 302.2.3.1) Additions to existing buildings. An addition that is structurally independent from an existing structure shall be designed and constructed with the seismic requirements for new structures. An addition that is not structurally independent from an existing structure shall be designed and constructed such that the entire structure conforms to the seismic-force-resistance requirements for new structures unless the following conditions are satisfied:

1. The addition conforms with the requirements for new structures,
2. The addition does not increase the seismic forces in any structural element of the existing structure by more than 10 percent cumulative since the original construction, unless the element has the capacity to resist the increased forces determined in accordance with ASCE 7 Section 1613, and
3. Additions do not decrease the seismic resistance of any structural element of the existing structure by more than 10 percent cumulative since the original construction, unless the element has the capacity to resist the forces determined in accordance with ASCE 7 Section 1613. If the building's seismic base shear capacity has been increased since the original construction, the percent change in base shear may be calculated relative to the increased value.

3403.2.3.2 (IEBC [B] 302.2.3.2) Alterations. Alterations are permitted to be made to any structure without requiring the structure to comply with Section 1613, provided the alterations conform to the requirements for a new structure. Alterations that increase the seismic force in any existing structural element by more than 10 percent cumulative since the original construction or decrease the design strength of any existing structural element to resist seismic forces by more than 10 percent cumulative since the original construction shall not be permitted unless the entire seismic-force-resisting system is determined to conform to ASCE 7 Section 1613 for a new structure. If the building's seismic base shear capacity has been increased since the original construction, the percent change in base shear may be calculated relative to the increased value.

Exception: Alterations to existing structural elements or additions of new structural elements that are not required by ASCE 7 Section 1613 and are initiated for the purpose of increasing the strength or stiffness of the seismic-force-resisting system of an existing structure need not be designed for forces conforming to ASCE 7 Section 1613, provided that an engineering analysis is submitted indicating the following:

1. The design strength of existing structural elements required to resist seismic forces is not reduced.
2. The seismic force to required existing structural elements is not increased beyond their design strength.
3. New structural elements are detailed and connected to the existing structural elements as required by Chapter 16.

4. New or relocated nonstructural elements are detailed and connected to existing or new structural elements as required by Chapter 16.
5. The alterations do not create a structural irregularity as defined in ASCE 7 Section 1613 or make an existing structural Irregularity more severe.
6. The alterations do not result in the creation of an unsafe condition.

3406.4 Change of occupancy. When a change of occupancy results in a structure being reclassified to a higher occupancy category, the structure shall conform to the seismic requirements for a new structure of the higher occupancy category. Values of R , Ω_0 , and C_d for the existing seismic force-resisting system shall be those specified by this code for an Ordinary system unless it is demonstrated that the existing system will provide performance equivalent to that of an Intermediate or Special system.

Exceptions:

1. Specific seismic detailing requirements of this code or ASCE 7 Section 1613 for a new structure shall not be required to be met where it can be shown that the level of performance and seismic safety is equivalent to that of a new structure. Such analysis shall consider the regularity, overstrength, redundancy and ductility of the structure within the context of the existing and retrofit (if any) detailing provided.
2. When a change of use results in a structure being reclassified from Occupancy Category I or II to Occupancy Category III and the structure is located in a seismic map area where $S_{DS} < 0.33$, compliance with the seismic requirements of ~~this code and ASCE 7 Section 1613~~ are not required.

PART II – IEBC

1. Revise as follows:

506.1.1.2 (Supp) IBC level seismic forces. When seismic forces are required to meet the *International Building Code* level, they shall be one of the following:

1. One-hundred percent of the values in the *International Building Code*. ~~The R -factor~~ Values of R , Ω_0 , and C_d used for analysis in accordance with Chapter 16 of the *International Building Code* shall be ~~the R -factor~~ those specified for structural systems classified as “Ordinary” in accordance with Table 12.2-1 of ASCE 7, unless it can be is demonstrated that the structural system satisfies the proportioning and detailing requirements for systems classified as “Intermediate” or “Special.” Will provide performance equivalent to that of an “Intermediate” or “Special” system.
2. Those associated with the BSE-1 and BSE-2 Earthquake Hazard Levels defined in ASCE 41. Where ASCE 41 is used, the corresponding performance levels shall be those shown in Table 506.1.1.2.

506.1.1.3 (Supp) Reduced IBC level seismic forces. When seismic forces are permitted to meet reduced *International Building Code* levels, they shall be one of the following:

1. Seventy-five percent of the forces prescribed in the *International Building Code*. ~~The R -factor~~ Values of R , Ω_0 , and C_d used for analysis in accordance with Chapter 16 of the *International Building Code* shall be ~~those the R -factor~~ as specified in Section 506.1.1.2 of this code.
2. In accordance with the applicable chapters in Appendix A of this code as specified in Items 2.1 through 2.5 below. Structures or portions of structures that comply with the requirements of the applicable chapter in Appendix A shall be deemed to comply with the requirements for reduced *International Building Code* force levels.
 - 2.1. The seismic evaluation and design of unreinforced masonry bearing wall buildings in Occupancy Category I or II are permitted to be based on the procedures specified in Appendix Chapter A1.
 - 2.2. Seismic evaluation and design of the wall anchorage system in reinforced concrete and reinforced masonry wall buildings with flexible diaphragms in Occupancy Category I or II are permitted to be based on the procedures specified in Appendix Chapter A2.
 - 2.3. Seismic evaluation and design of cripple walls and sill plate anchorage in residential buildings of light frame wood construction in Occupancy Category I or II are permitted to be based on the procedures specified in Appendix Chapter A3.
 - 2.4. Seismic evaluation and design of soft, weak or open-front wall conditions in multiunit residential buildings of wood construction in Occupancy Category I or II are permitted to be based on the procedures specified in Appendix Chapter A4.
 - 2.5. Seismic evaluation and design of concrete buildings and concrete with masonry infill buildings in all occupancy categories are permitted to be based on the procedures specified in Appendix Chapter A5.

3. In accordance with ASCE 31 based on the applicable performance level as shown in Table 506.1.1.2.
4. Those associated with the BSE-1 Earthquake Hazard Level defined in ASCE 41 and the performance level as shown in Table 506.1.1.2. Where ASCE 41 is used, the design spectral response acceleration parameters *SXS* and *SX1* shall not be taken less than 75 percent of the respective design spectral response acceleration parameters *SDS* and *SD1* defined by the *International Building Code* and its reference standards.

Reason: IBC: To clarify the intent of the code, correct overlaps between code sections, and ensure appropriate application to existing buildings of “seismic requirements for a new structure.”

Sections 3403.2.3 and 3406.4 refer to ASCE 7 for seismic design criteria. First, they should actually refer to Section 1613, which contains important provisions besides those in ASCE 7 and which modifies ASCE 7 in certain respects. Second, whether Section 1613 or ASCE 7, these criteria for new design require the engineer to identify the seismic force-resisting system of the existing building. In many cases, the existing building will not possess the detailing necessary to qualify for “Special” or even “Intermediate” systems. If the detailing is unknown or inadequate, design parameters for “Ordinary” systems must be used.

The language proposed is based on existing language in IBC Section 506.1.1.2, but the current IBC wording is modified to remove the bright line the IBC uses to distinguish when design parameters for Ordinary systems are needed. Rather than require strict compliance with the “proportioning and detailing requirements” of Intermediate or Special systems, general equivalence, similar to that contemplated by IBC Section 3406.4 is preferable because for many existing buildings there are no applicable provisions to check against. Also, “equivalent performance” preserves some engineering and regulatory discretion appropriate to work with existing buildings. A coordination change to IBC Section 506.1.1.2 is being submitted separately.

3403.2.3, first sentence: The wording is clarified, and “modification or change of occupancy” is deleted because change of occupancy is covered by 3406, not by 3403.

Note to ICC: NCSEA and SEAOC have separately proposed a broad reorganization of current Section 3403. If Section 3403 is reorganized per that proposal, the text proposed here as the second sentence of current Section 3403.2.3 would go at the end of proposed Section 3403.4 and at the end of proposed Section 3404.4.

IEBC: This proposal is submitted in coordination with a separate proposal also submitted by the NCSEA Existing Buildings Committee regarding IBC Section 3403.2.3.2. It replaces current IBC language on the subject of voluntary seismic rehabilitation in two places.

To improve usability and to ensure complete and appropriate application of Chapter 16 code provisions to existing buildings. The proposal:

- addresses all three seismic design parameters, not just *R*.
- changes the bright line criteria established by the IBC’s “proportioning and detailing requirements” for new structures to a more appropriate criterion based on equivalent performance.

These sections require the engineer to identify the seismic force-resisting system of the existing or rehabilitated building. In many cases, the existing building will not possess the detailing necessary to qualify for “Special” or even “Intermediate” systems. If the detailing is unknown or inadequate, the current provisions properly require use of design parameters for “Ordinary” systems.

However, the current provisions would require the existing building to meet the letter of the IBC’s prescriptive requirements for proportioning and detailing, which is problematic and sometimes inappropriate for existing buildings. This proposal would replace the current prescriptive criteria with a requirement for equivalent performance, which can be demonstrated in a number of ways. (For example, some or all of the criteria used by the IBC for undefined structural systems or for change of occupancy in IBC Section 3406.4 may be applied as appropriate.) The performance-based criterion is preferable because for many existing buildings there are no applicable provisions to check against. Also, “equivalent performance” preserves some engineering and regulatory discretion appropriate to work with existing buildings.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

PART I – IBC STRUCTURAL

Errata Part I - IBC: Revise the following sections:

3403.2.3.1 (IEBC [B] 302.2.3.1) Additions to existing buildings.

Item 2: Replace “this code and ASCE 7” with “Section 1613”

Item 3: Replace “this code and ASCE 7” with “Section 1613”

3403.2.3.2 (IEBC [B] 302.2.3.2) Alterations.

1st paragraph: Replace “this code and ASCE 7” with “Section 1613”

Exception: Replace “this code and ASCE 7” with “Section 1613” in 2 places

Exception 5: Replace “this code and ASCE 7” with “Section 1613”

3406.4 Change of occupancy.

Exception 1: Replace “this code and ASCE 7” with “Section 1613”

Exception 2: Replace “this code and ASCE 7” with “Section 1613”

(Portions of proposal not shown remain unchanged)

Committee Action:

Approved as Modified

Modify proposal as follows:

3403.2.3 (IEBC[B] 302.2.3) Seismic. Seismic requirements for additions and alterations shall be in accordance with this section. Values of *R*, Ω_0 , and *C_v* for the existing seismic force-resisting system shall be those specified by this code for an Ordinary system unless it is demonstrated that the existing system will provide performance equivalent to that of an Intermediate or Special system.

3403.2.3.1 (IEBC[B] 302.2.3.1) Additions to existing buildings. An addition that is structurally independent from an existing structure shall be designed and constructed with the seismic requirements for new structures. An addition that is not structurally independent from an existing structure shall be designed and constructed such that the entire structure conforms to the seismic-force-resistance requirements for new structures unless the following conditions are satisfied:

1. The addition conforms with the requirements for new structures,
2. The addition does not increase the seismic forces in any structural element of the existing structure by more than 10 percent cumulative since the original construction, unless the element has the capacity to resist the increased forces determined in accordance with Section 1613, and
3. Additions do not decrease the seismic resistance of any structural element of the existing structure by more than 10 percent cumulative since the original construction, unless the element has the capacity to resist the forces determined in accordance with Section 1613. If the building's seismic base shear capacity has been increased since the original construction, the percent change in base shear may be calculated relative to the increased value.

3403.2.3.2 (IEBC[B] 302.2.3.2) Alterations. Alterations are permitted to be made to any structure without requiring the structure to comply with Section 1613, provided the alterations conform to the requirements for a new structure. Alterations that increase the seismic force in any existing structural element by more than 10 percent cumulative since the original construction or decrease the design strength of any existing structural element to resist seismic forces by more than 10 percent cumulative since the original construction shall not be permitted unless the entire seismic-force-resisting system is determined to conform to Section 1613 for a new structure. If the building's seismic base shear capacity has been increased since the original construction, the percent change in base shear may be calculated relative to the increased value.

Exception: Alterations to existing structural elements or additions of new structural elements that are not required by ~~Section 1613~~ this Chapter and are initiated for the purpose of increasing the strength or stiffness of the seismic-force-resisting system of an existing structure need not be designed for forces conforming to Section 1613, provided that an engineering analysis is submitted indicating the following:

1. The design strength of existing structural elements required to resist seismic forces is not reduced.
2. The seismic force to required existing structural elements is not increased beyond their design strength.
3. New structural elements are detailed and connected to the existing structural elements as required by Chapter 16.
4. New or relocated nonstructural elements are detailed and connected to existing or new structural elements as required by Chapter 16.
5. The alterations do not create a structural irregularity as defined in Section 1613 or make an existing structural Irregularity more severe.
6. The alterations do not result in the creation of an unsafe condition.

3406.4 Change of occupancy. When a change of occupancy results in a structure being reclassified to a higher occupancy category, the structure shall conform to the seismic requirements for a new structure of the higher occupancy category. Values of R , Ω_0 , and C_d for the existing seismic force-resisting system shall be those specified by this code for an Ordinary system unless it is demonstrated that the existing system will provide performance equivalent to that of an Intermediate or Special system.

Exceptions:

1. Specific seismic detailing requirements of this code or Section 1613 for a new structure shall not be required to be met where it can be shown that the level of performance and seismic safety is equivalent to that of a new structure. Such analysis shall consider the regularity, overstrength, redundancy and ductility of the structure within the context of the existing and retrofit (if any) detailing provided.
2. When a change of use results in a structure being reclassified from Occupancy Category I or II to Occupancy Category III and the structure is located in a seismic map area where $S_{DS} < 0.33$, compliance with the seismic requirements of this code and Section 1613 are not required.

Committee Reason: This proposal provides guidance to engineers on selecting R-values and other coefficients for existing buildings with structural systems that do not meet the seismic detailing requirements for new buildings. The modification corrects the Exception to Section 3403.2.3.2 to refer to this chapter (Chapter 34) which is what was intended.

Assembly Action:

None

PART II – IEBC

Errata Part II – IEBC: Revise Section 506.1.1.3, Item 1 as follows:

506.1.1.3 (Supp) Reduced IBC level seismic forces. When seismic forces are permitted to meet reduced *International Building Code* levels, they shall be one of the following:

1. Seventy-five percent of the forces prescribed in the *International Building Code*. ~~The R-factor~~ Values of R , Ω_0 , and C_d used for analysis in accordance with Chapter 16 of the *International Building Code* shall be those the R-factor as specified in Section 506.1.1.2 of this code.

(Portions of proposal not shown remain unchanged)

Committee Action:

Disapproved

Committee Reason: There seemed to be some confusion regarding whether the proposed language accomplished the intent of the proponent. The committee felt that it was important to include all three factors, and felt that the intent of the proponent would be appropriate. However, the confusion was with the actual language and whether the outcome was different than the intent of the proponent. Therefore, the committee disapproved the proposal.

Assembly Action:

None

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because public comments were submitted.

Public Comment 1:

David Bonowitz, SE, representing the National Council of Structural Engineers Associations Existing Buildings Committee, requests Approval as Modified by this public comment for Part I.

Further modify proposal as follows:

3403.2.3 Seismic. Seismic requirements for additions and alterations shall be in accordance with this section. Where the existing seismic force-resisting system is a type that can be designated Ordinary, values of R , Ω_o , and C_d for the existing seismic force-resisting system shall be those specified by this code for an Ordinary system unless it is demonstrated that the existing system will provide performance equivalent to that of a Detailed, ~~an~~ Intermediate or Special system.

3406.4 Change of occupancy. When a change of occupancy results in a structure being reclassified to a higher occupancy category, the structure shall conform to the seismic requirements for a new structure of the higher occupancy category. Where the existing seismic force-resisting system is a type that can be designated Ordinary, values of R , Ω_o , and C_d for the existing seismic force-resisting system shall be those specified by this code for an Ordinary system unless it is demonstrated that the existing system will provide performance equivalent to that of a Detailed, ~~an~~ Intermediate or Special system.

Exceptions:

1. Specific seismic detailing requirements of this code or Section 1613 for a new structure shall not be required to be met where it can be shown that the level of performance and seismic safety is equivalent to that of a new structure. Such analysis shall consider the regularity, overstrength, redundancy and ductility of the structure within the context of the existing and retrofit (if any) detailing provided.
2. When a change of use results in a structure being reclassified from Occupancy Category I or II to Occupancy Category III and the structure is located in a seismic map area where $S_{DS} < 0.33$, compliance with the seismic requirements of this code and Section 1613 are not required.

(Portions of proposal not shown remain unchanged)

Commenter's Reason: This is an editorial clarification only. The intent of G209 – that existing systems should be considered Ordinary by default – was fully approved by the Committee. This comment merely clarifies that the intent only applies to systems for which there is a choice of Ordinary, Special, Intermediate, or Detailed to be made.

This item is on the agenda for individual consideration because public comments were submitted.

Public Comment 2:

David Bonowitz, SE, representing the National Council of Structural Engineers Associations Existing Buildings Committee, requests Approval as Modified by this public comment for Part II.

Modify proposal as follows:

506.1.1.2 (Supp) IBC level seismic forces. When seismic forces are required to meet the *International Building Code* level, they shall be one of the following:

1. One-hundred percent of the values in the *International Building Code*. Where the existing seismic force-resisting system is a type that can be designated "Ordinary," values of R , Ω_o , and C_d used for analysis in accordance with Chapter 16 of the *International Building Code* shall be those specified for structural systems classified as "Ordinary" in accordance with Table 12.2-1 of ASCE 7, unless it is demonstrated that the structural system will provide performance equivalent to that of a "Detailed," ~~an~~ "Intermediate" or "Special" system.
2. Those associated with the BSE-1 and BSE-2 Earthquake Hazard Levels defined in ASCE 41. Where ASCE 41 is used, the corresponding performance levels shall be those shown in Table 506.1.1.2.

(Portions of proposal not shown remain unchanged)

Commenter's Reason: This is an editorial clarification only. The intent of G209 – that existing systems should be considered Ordinary by default – is already in this IBC section. This comment merely clarifies that the intent only applies to systems for which there is a choice of Ordinary, Special, Intermediate, or Detailed to be made.

This comment is moot and will be withdrawn if either of the following occurs:

- The Final Action on G209 Part II is not Approved as Submitted, in accordance with a separate Public Comment.
- G209 Part I is not Approved as Modified in accordance with a similar Public Comment.

Final Hearing Results

**G209-07/08, Part I
G209-07/08, Part II**

**AMPC1
AMPC2**

Code Change No: **G210-07/08**

Original Proposal

Sections: 3403.2.3.1 (IEBC [B] 302.2.3.1), 3403.2.3.2 (IEBC [B] 302.2.3.2), 3406.4 (IEBC [B] 305.4)

Proponent: Philip Brazil, PE, Reid Middleton, Inc., representing himself

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE.

Revise as follows:

3403.2.3.1 (IEBC 302.2.3.1) Additions to existing buildings. An addition that is structurally independent from an existing structure shall be designed and constructed with the seismic requirements for new structures. An addition that is not structurally independent from an existing structure shall be designed and constructed such that the entire structure conforms to the seismic-force-resistance requirements for new structures unless the following conditions are satisfied:

1. The addition conforms with the requirements for new structures,
2. The addition does not increase the seismic forces in any structural element of the existing structure by more than 10 percent cumulative since the original construction, unless the element has the capacity to resist the increased forces determined in accordance with ASCE 7 Section 1613, and
3. Additions do not decrease the seismic resistance of any structural element of the existing structure by more than 10 percent cumulative since the original construction, unless the element has the capacity to resist the forces determined in accordance with ASCE 7 Section 1613. If the building's seismic base shear capacity has been increased since the original construction, the percent change in base shear may be calculated relative to the increased value.

3403.2.3.2 (IEBC 302.2.3.2) Alterations. Alterations are permitted to be made to any structure without requiring the structure to comply with Section 1613, provided the alterations conform to the requirements for a new structure. Alterations that increase the seismic force in any existing structural element by more than 10 percent cumulative since the original construction or decrease the design strength of any existing structural element to resist seismic forces by more than 10 percent cumulative since the original construction shall not be permitted unless the entire seismic-force-resisting system is determined to conform to ASCE 7 comply with Section 1613 for a new structure. If the building's seismic base shear capacity has been increased since the original construction, the percent change in base shear may be calculated relative to the increased value.

Exception: Alterations to existing structural elements or additions of new structural elements that are not required by ASCE 7 and are initiated for the purpose of increasing the strength or stiffness of the seismic-force-resisting system of an existing structure need not be designed for forces conforming to ASCE 7 comply with Section 1613, provided that an engineering analysis is submitted indicating the following:

1. The design strength of existing structural elements required to resist seismic forces is not reduced.
2. The seismic force to required existing structural elements is not increased beyond their design strength.
3. New structural elements are detailed and connected to the existing structural elements as required by Chapter 16.
4. New or relocated nonstructural elements are detailed and connected to existing or new structural elements as required by Chapter 16.
5. The alterations do not create a structural irregularity as defined in ASCE 7 or make an existing structural irregularity more severe.
6. The alterations do not result in the creation of an unsafe condition.

3406.4 Change of occupancy (IEBC [B] 305.4 Structural). When a change of occupancy results in a structure being reclassified to a higher occupancy category, the structure shall conform to the seismic requirements for a new structure.

Exceptions:

1. Specific seismic detailing requirements of this code or ASCE 7 for a new structure shall not be required to be met where it can be shown that the level of performance and seismic safety is equivalent to that of a new structure. Such analysis shall consider the regularity, overstrength, redundancy and ductility of the structure within the context of the existing and retrofit (if any) detailing provided.
2. When a change of use results in a structure being reclassified from Occupancy Category I or II to occupancy Category III and the structure is located in a seismic map area where the seismic coefficient $S_{DS, \leq}$ is less than 0.33, compliance with the seismic requirements of this code and ASCE 7 are not required.

Reason: The purpose of this proposal is to align the references to ASCE 7 in the affected sections with related sections of the IBC that currently reference ASCE 7. The references to ASCE 7 are for requirement to determine seismic forces, to design for forces complying with ASCE 7 or meet specific seismic detailing requirements contained therein. IBC Section 1613, however, contains the primary charging language for the design and construction of structures or portions thereof to resist the effects of earthquake motions, including the determination of seismic forces, and accomplishes the task by referencing ASCE 7, excluding Chapter 14 and Appendix 11A. Exception 2 to Section 3406.4 is revised for consistency with other references in the IBC to seismic spectral response acceleration parameters (i.e., Section 1808.2.23.1).

This proposal was prompted, in part, because the references to ASCE 7 in the affected sections are the only instances in the 2006 IBC where ASCE 7 is cited without a specific reference to the portions of ASCE 7 applicable to the subject matter.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

This code change was heard by the IBC Structural Code Development Committee.

Committee Action:

Approved as Modified

Modify proposal as follows:

3403.2.3.2 (IEBC 302.2.3.2) Alterations. Alterations are permitted to be made to any structure without requiring the structure to comply with Section 1613, provided the alterations conform to the requirements for a new structure. Alterations that increase the seismic force in any existing structural element by more than 10 percent cumulative since the original construction or decrease the design strength of any existing structural element to resist seismic forces by more than 10 percent cumulative since the original construction shall not be permitted unless the entire seismic-force-resisting system is determined to comply with Section 1613 for a new structure. If the building's seismic base shear capacity has been increased since the original construction, the percent change in base shear may be calculated relative to the increased value.

Exception: Alterations to existing structural elements or additions of new structural elements that are not required by ASCE 7 this Chapter and are initiated for the purpose of increasing the strength or stiffness of the seismic-force-resisting system of an existing structure need not be designed for forces complying with Section 1613, provided that an engineering analysis is submitted indicating the following:

1. The design strength of existing structural elements required to resist seismic forces is not reduced.
2. The seismic force to required existing structural elements is not increased beyond their design strength.
3. New structural elements are detailed and connected to the existing structural elements as required by Chapter 16.
4. New or relocated nonstructural elements are detailed and connected to existing or new structural elements as required by Chapter 16.
5. The alterations do not create a structural irregularity as defined in ASCE 7 or make an existing structural irregularity more severe.
6. The alterations do not result in the creation of an unsafe condition.

(Portions of the proposal not shown remain unchanged)

Committee Reason: This proposal cleans up these provisions by making the appropriate reference to earthquake load requirements, without directing you to the ASCE 7 standard. The modification corrects the Exception to Section 3403.2.3.2 to refer to this chapter (Chapter 34) which is more appropriate, since the requirement is given in this chapter rather than ASCE 7.

Assembly Action:

None

Final Hearing Results

G210-07/08

AM

Code Change No: **G211-07/08**

Original Proposal

Sections: 3403.2.3.2 (IEBC [B] 302.2.3.2), IEBC 807.7

Proponent: David Bonowitz, SE, representing the National Council of Structural Engineers Associations Existing Buildings Committee

THESE PROPOSALS ARE ON THE AGENDA OF THE IBC STRUCTURAL AND IEBC CODE DEVELOPMENT COMMITTEES AS 2 SEPARATE CODE CHANGES. SEE TENTATIVE HEARING ORDER FOR THESE COMMITTEES.

PART I – IBC STRUCTURAL

Revise as follows:

3403.2.3.2 (IEBC [B] 302.2.3.2) Alterations. Alterations are permitted to be made to any structure without requiring the structure to comply with Section 1613, provided the alterations conform to the requirements for a new structure. Alterations that increase the seismic force in any existing structural element by more than 10 percent cumulative since the original construction or decrease the design strength of any existing structural element to resist seismic forces by more than 10 percent cumulative since the original construction shall not be permitted unless the entire seismic-force-resisting system is determined to conform to ASCE 7 for a new structure. If the building's seismic base shear capacity has been increased since the original construction, the percent change in base shear may be calculated relative to the increased value.

Exception: Alterations to existing structural elements or additions of new structural elements that are not required by ASCE 7 otherwise required by this chapter and are initiated for the purpose of ~~increasing the strength or stiffness~~ improving the performance of the seismic-force-resisting system of an existing structure or the performance of seismic bracing or anchorage of existing nonstructural elements ~~need not be designed for forces conforming to ASCE 7~~ shall be permitted, provided that an engineering analysis is submitted indicating demonstrating the following:

1. ~~The design strength of existing structural elements required to resist seismic forces is not reduced. The altered structure and the altered nonstructural elements are no less conforming with the provisions of this code with respect to earthquake design than they were prior to the alteration.~~
2. ~~The seismic force to required existing structural elements is not increased beyond their design strength.~~
3. 2. New structural elements are detailed and connected to the existing structural elements as required by Chapter 16.
4. 3. New or relocated nonstructural elements are detailed and connected to existing or new structural elements as required by Chapter 16.
5. 4. The alterations do not create a structural irregularity as defined in ASCE 7 or make an existing structural irregularity more severe.
6. ~~The alterations do not result in the creation of an unsafe condition.~~

PART II – IEBC

Delete and substitute as follows:

~~**807.7 Voluntary lateral force-resisting system alterations.** Alterations of existing structural elements and additions of new structural elements that are initiated for the purpose of increasing the lateral force-resisting strength or stiffness of an existing structure and that are not required by other sections of this code shall not be required to be designed for forces conforming to the *International Building Code*, provided that an engineering analysis is submitted to show that:~~

1. ~~The capacity of existing structural elements required to resist forces is not reduced;~~
2. ~~Either the lateral loading to existing structural elements is not increased beyond their capacity or the lateral loading to existing structural elements is not increased by more than 10 percent;~~

- ~~3. New structural elements are detailed and connected to the existing structural elements as required by the *International Building Code*;~~
- ~~4. New or relocated nonstructural elements are detailed and connected to existing or new structural elements as required by the *International Building Code*; and~~
- ~~5. A dangerous condition as defined in this code is not created.~~

~~Voluntary alterations to lateral force-resisting systems conducted in accordance with Appendix A and the referenced standards of this code shall be permitted.~~

807.7 Voluntary improvement of the seismic force-resisting system. Alterations to existing structural elements or additions of new structural elements that are not otherwise required by this chapter and are initiated for the purpose of improving the performance of the seismic-force-resisting system of an existing structure or the performance of seismic bracing or anchorage of existing nonstructural elements shall be permitted, provided that an engineering analysis is submitted demonstrating the following:

1. The altered structure and the altered nonstructural elements are no less conforming with the provisions of this code with respect to earthquake design than they were prior to the alteration.
2. New structural elements are detailed and connected to the existing structural elements as required by Chapter 16 of the *International Building Code*.
3. New or relocated nonstructural elements are detailed and connected to existing or new structural elements as required by Chapter 16 of the *International Building Code*.
4. The alterations do not create a structural irregularity as defined in ASCE 7 or make an existing structural irregularity more severe.

Voluntary alterations to the seismic force-resisting system in accordance with the applicable chapters of Appendix A of this code shall be permitted.

Reason. Part I. To better meet the intent of this exception, which is to allow voluntary improvements that do not necessarily bring the whole structure “up to code,” as might otherwise be required by 3403.2.3.2.(IEBC 302.2.3.2),

- The initial paragraph is revised editorially to make it explicit language, to remove improper references to ASCE 7, and to refer more generally to “improvement” as opposed to simply increased strength or stiffness.
- The initial paragraph is supplemented to include voluntary improvements to seismic bracing of nonstructural components, which are as common and as effective at reducing earthquake risk as are structural retrofits.
- Current items 1, 2, and 6 are replaced by a more general requirement that the voluntary improvement must leave the building “no less conforming”. This is the intent of the exception expressed most clearly and directly. The “no less conforming” standard allows for greater creativity and design flexibility in the service of improved performance and reduced risk.
- Current item 1 is well-intentioned but can be contrary to the intent of the exception. Consider, for example, the installation of a steel frame as a backup system to prevent collapse of an inadequate stucco shear wall in the first story of an existing building. If the replacement involves demolition of some of the existing shear wall, that would represent a reduction in capacity and would therefore not be allowed by the current provision even though the altered structure would certainly be more safe. Similarly, the current provision would appear to prevent the minor demolition or modification of existing elements in order to install load path elements such as hold-downs, collectors, or out-of-plane wall anchors. The proposed language would allow these reasonable improvements.

Part II. This proposal is submitted to coordinate with proposed revisions to IBC section 3403.2.3.2.(IEBC 302.2.3.2) It replaces current IEBC language on the subject of voluntary seismic rehabilitation.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: A concern is if the last sentence of the proposed IEBC Section 807.7 would conflict with IEBC Section 101.7.

Public Hearing Results

PART I – IBC STRUCTURAL

Committee Action:

Approved as Submitted

Committee Reason: The proposal clarifies the intent of the Exception to Section 3403.2.3.2 which allows voluntary seismic upgrades to a building’s seismic-force-resisting system without fully complying with the earthquake load provision.

Assembly Action:

None

PART II – IEBC

Committee Action:

Disapproved

Committee Reason: The reference in Item 2 to Chapter 16 of the IBC conflicts with Section 101.7.

Assembly Action:

None

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

David Bonowitz, SE, representing the National Council of Structural Engineers Associations, Existing Buildings Subcommittee, requests Approval as Submitted for Part II.

Commenter's Reason: G211 Part II should be Approved as Submitted for the following reasons, any of which should be sufficient:

1. The IBC-Structural Committee approved nearly identical changes for IBC Chapter 34, as G211 Part I. Consistency between the codes is important.
2. IEBC Committee's reason for disapproval – that Item 2's reference to Chapter 16 conflicts with section 101.7 – does not make sense. Section 101.7 is about Appendices, but Item 2 has nothing to do with Appendices. Besides, while Item 2 does refer to IBC Chapter 16 (as does Item 3), it does so no more than the current wording refers to the IBC, so Disapproval does not solve any alleged problem.
3. If conflict with section 101.7 is the issue, the Committee's reason probably intends to reference the final sentence of the proposal, which is about the Appendix chapters. But the sentence in question is *essentially identical to the current language* of the code. There is no change here, so Disapproval would not fix anything or prevent any wrong. If the proposal is Disapproved, any alleged conflict with section 101.7 will remain.
4. The concern about appendices was prompted by an ICC staff note added to the monograph. But the ICC staff note was incorrect. ICC staff assured the Committee and the Assembly at the hearings for the 2006 edition that despite 101.7, Appendix Chapters need not be individually adopted if they are specifically cited by the code provision. That is why the existing language is already allowed.
5. When the subject of the ICC staff note came up during Committee deliberations, the moderator improperly did not allow the proponent to address it.

Final Hearing Results

G211-07/08, Part I	AS
G211-07/08, Part II	AS

Code Change No: G215-07/08

Original Proposal

Sections: 3409.6 (IEBC [B] 308.6), 3409.8.7 (IEBC [B] 308.8.7), 3409.8.8 (IEBC [B] 308.8.8) (New), 3409.8.9 (IEBC [B] 308.8.9) (New); IEBC 605.1.8, 605.1.9 (New), 706.3, 706.4 (New), 706.5 (New)

Proponent: Dominic Marinelli, United Spinal Association, Deb A. Cotter, National Council on Independent Living (NCIL), Marilyn Golden, Disability Rights Education and Defense Fund, Susan Prokop, Paralyzed Veterans of America, Anne Sommers, American Association of People with Disabilities, Elinor Ginzler, (AARP) American Association of Retired Persons

THESE PROPOSALS ARE ON THE AGENDA OF THE IBC MEANS OF EGRESS AND IEBC CODE DEVELOPMENT COMMITTEE AS 2 SEPARATE CODE CHANGES. PLEASE SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IBC MEANS OF EGRESS

1. Revise as follows:

3409.6 (IEBC [B] 308.6) (Supp) Alterations. A building, facility or element that is altered shall comply with the applicable provisions in Chapter 11 and ICC A117.1, unless technically infeasible. Where compliance with this section is technically infeasible, the alteration shall provide access to the maximum extent technically feasible.

Exceptions:

1. The altered element or space is not required to be on an accessible route, unless required by Section 3409.7.

2. Accessible means of egress required by Chapter 10 are not required to be provided in existing buildings and facilities.
3. The alteration to Type A individually owned dwelling units within a Group R-2 occupancy shall meet the provision for a Type B dwelling unit and shall comply with the applicable provisions in Chapter 11 and ICC A117.1.
4. ~~Type A dwelling units or sleeping units required by Section 1107 are not required to be provided in existing building and facilities being altered.~~

3409.8.7 (IEBC [B] 308.8.7)(Supp) Accessible dwelling or sleeping units. Where Group I-1, I-2, I-3, R-1, R-2 or R-4 dwelling or sleeping units are being altered or added, the requirements of Section 1107 for Accessible units and Section 907 for visible alarms apply only to the quantity of spaces being altered or added.

2. Add new text as follows:

3409.8.8 (IEBC [B] 308.8.8)Type A dwelling or sleeping units. Where more than 20 Group R-2 dwelling or sleeping units are being altered or added, the requirements of Section 1107 for Type A units and Section 907 for visible alarms apply only to the quantity of spaces being altered or added.

3409.8.9 (IEBC [B] 308.8.9)Type B dwelling or sleeping units. Where 4 or more Group I-1, I-2, R-1, R-2, R-3 or R-4 dwelling or sleeping units are being added, the requirements of Section 1107 for Type A units and Section 907 for visible alarms apply only to the quantity of spaces being added.

(Renumber subsequent sections)

PART II – IEBC

1. Revise as follows:

605.1.8 [Supp] Accessible dwelling or sleeping units. Where Group I-1, I-2, I-3, R-1, R-2, or R-4 dwelling or sleeping units are being altered, the requirements of Section 1107 of the *International Building Code* for accessible ~~or Type A~~ units and Chapter 9 of the *International Building Code* for visible alarms apply only to the quantity of the spaces being altered.

2. Add new text as follows:

605.1.9 Type A dwelling or sleeping units. Where more than 20 Group R-2 dwelling or sleeping units are being altered, the requirements of Section 1107 of the *International Building Code* for Type A units and Chapter 9 of the *International Building Code* for visible alarms apply only to the quantity of the spaces being altered.

3. Revise as follows:

706.3 [Supp] Accessible dwelling units and sleeping units. Where Group I-1, I-2, I-3, R-1, R-2, or R-4 dwelling units or sleeping units are being added, the requirements of Section 1107 of the *International Building Code* for accessible units ~~or Type A~~ units and Chapter 9 of the *International Building Code* for visible alarms apply only to the quantity of spaces being added.

4. Add new text as follows:

706.4 Type A dwelling or sleeping units. Where more than 20 Group R-2 dwelling or sleeping units are being added, the requirements of Section 1107 of the *International Building Code* for Type A units and Chapter 9 of the *International Building Code* for visible alarms apply only to the quantity of the spaces being added.

706.5 Type B dwelling or sleeping units. Where 4 or more Group I-1, I-2, R-1, R-2, R-3 or R-4 dwelling or sleeping units are being added, the requirements Section 1107 of the *International Building Code* for Type B units and Chapter 9 of the *International Building Code* for visible alarms apply only to the quantity of the spaces being added.

Reason: The original proponent of the code change G206-06/07 to eliminate Type A dwelling units in existing buildings (IBC Section 3409.6 Exp. 4) was concerned that the alteration of a single dwelling unit would require 2% of units to provide Type A features. G206 was approved by the IBC Means of Egress Committee, but disapproved by the IEBC committee. Currently there is a conflict between these two codes.

The intent of this proposal is to coordinate and clarify in IBC and IEBC by do the following:

- IBC 3409.8.8 and IEBC 605.1.9 clarifies that more than 20 units would have to be altered before 2% would have to provide Type A features.
- IBC 3409.8.8 and IEBC 706.4 clarify that Type A units are required in additions that contain 20 or more units.
- IBC 3409.8.9 and IEBC 706.5 clarify that Type B units are required in additions that contain 4 or more units. This is consistent with the Fair Housing Act.

- Current IBC 3409.5.1 and IEBC 605.1.12 ensures that alterations will not require greater accessibility than that which would be required for new construction.
- If altering an existing apartment to comply with Type A requirements has little likelihood of being accomplished because of existing conditions, the permit applicant can't take advantage of the "technically infeasible" exception in IBC 3409.6 and IEBC 605.1.

The Type A units (previously Adaptable units) has been in the codes since 1975. Most existing apartment buildings have been built or modified during that time period (i.e. they have Type A units already), so this should have minimal effects on housing while it has significant effects on persons with disabilities if these units start to disappear in existing buildings.

Cost Impact: The code change proposal will not increase the cost of construction – reflects 2006 IBC.

Public Hearing Results

PART I – IBC MEANS OF EGRESS

Committee Action:

Approved as Modified

Modify the proposal as follows:

3409.6 (IEBC [B] 308.6) (Supp) Alterations. A building, facility or element that is altered shall comply with the applicable provisions in Chapter 11 and ICC A117.1, unless technically infeasible. Where compliance with this section is technically infeasible, the alteration shall provide access to the maximum extent technically feasible.

Exceptions:

1. The altered element or space is not required to be on an accessible route, unless required by Section 3409.7.
2. Accessible means of egress required by Chapter 10 are not required to be provided in existing buildings and facilities.
3. The alteration to Type A individually owned dwelling units within a Group R-2 occupancy shall meet the provision for a Type B dwelling unit and shall comply with the applicable provisions in Chapter 11 and ICC A117.1.

3409.8.7 (IEBC [B] 308.8.7)(Supp) Accessible dwelling or sleeping units. Where Group I-1, I-2, I-3, R-1, R-2 or R-4 dwelling or sleeping units are being altered or added, the requirements of Section 1107 for Accessible units and Section 907 for visible alarms apply only to the quantity of spaces being altered or added.

~~**3409.8.8 (IEBC [B] 308.8.8) Type A dwelling or sleeping units.** Where more than 20 Group R-2 dwelling or sleeping units are being altered or added, the requirements of Section 1107 for Type A units and Section 907 for visible alarms apply only to the quantity of spaces being altered or added.~~

~~**3409.8.9 (IEBC [B] 308.8.9) Type B dwelling or sleeping units.** Where 4 or more Group I-1, I-2, R-1, R-2, R-3 or R-4 dwelling or sleeping units are being added, the requirements of Section 1107 for Type A units and Section 907 for visible alarms apply only to the quantity of spaces being added.~~

Committee Reason: The modification is to delete the proposed language for Sections 3409.8.8 and 3409.8.9 because this is already addressed in the existing text. It was noted that Section 3409.8.9 was intended for Type B requirements, not Type A requirements – this was a typographical error. The deletion of Exception 4 to Section 3409.6 was approved. While Type A units are not required by the Fair Housing Act (FHA), Section 3409.6 Exception 4 does take the codes further away from compliance with the Americans with Disabilities Act (ADA) and should be deleted.

Assembly Action:

None

PART II – IEBC

Committee Action:

Approved as Submitted

Committee Reason: The proposal fixes a disparity between the IBC and IEBC.

Assembly Action:

None

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because public comments were submitted.

Public Comment 1:

Dominic Marinelli, United Spinal Association, Deb A. Cotter, National Council on Independent Living (NCIL), Marilyn Golden, Disability Rights Education and Defense Fund, Susan Prokop, Paralyzed Veterans of America, Anne Sommers, American Association of People with Disabilities, Elinor Ginzler, (AARP) American Association of Retired Persons requests Approval as Modified by this public comment for Part I.

Further modify proposal as follows:

3409.8.7 (IEBC 308.8.7) (Supp) Accessible dwelling or sleeping units. Where Group I-1, I-2, I-3, R-1, R-2 or R-4 dwelling or sleeping units are being altered or added, the requirements of Section 1107 for Accessible units ~~and Section 907 for visible alarms~~ apply only to the quantity of spaces being altered or added.

3409.8.8 (IEBC 308.8.8) Type A dwelling or sleeping units. Where more than 20 Group R-2 dwelling or sleeping units are being added, the requirements of Section 1107 for Type A units apply only to the quantity of the spaces being added.

3409.8.9 (IEBC 308.8.9) Type B dwelling or sleeping units. Where 4 or more Group I-1, I-2, R-1, R-2, R-3 or R-4 dwelling or sleeping units are being added, the requirements Section 1107 for Type B units apply only to the quantity of the spaces being added.

(Portions of proposal not shown remain unchanged)

Commenter's Reason: There are three proposals being submitted regarding dwelling and sleeping units in existing buildings. They are split between additions, alterations and change of occupancy for clarity. The intent is that all three proposals will pass. This proposal is for **additions**.

G215-07/08 Part II was approved by the IEBC committee and would require Type A and Type B units in additions large enough that the requirements would be applicable as part of new construction. The intent of this proposal is to both coordinate IEBC and IBC and clarify when Type A and Type B units are required in additions. This is consistent with Fair Housing requirements and is not specifically addressed in current text. Therefore, this is more of a clarification than an additional requirement.

The language for visible alarms was removed from Section 3409.8.7 and not included in the new text because alterations for alarms are addressed in the International Fire Code.

Final Hearing Results

G215-07/08, Part I
G215-07/08, Part II

AMPC
AS

Code Change No: G216-07/08

Original Proposal

Sections: 3410.4.1 (IEBC 1301.4.1)

Proponent: Peter Somers, SE, Magnusson Klemencic Associates, representing NCSEA Existing Building Committee

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE.

Revise as follows:

3410.4.1 (IEBC 1301.4.1) Structural analysis. The owner shall have a structural analysis of the existing building made to determine adequacy of structural systems for the proposed alteration, addition, or change of occupancy. ~~The existing building shall be capable of supporting the minimum load requirements of~~ analysis shall demonstrate that the building with the work completed is capable of resisting the loads specified in Chapter 16.

Reason: Editorial clarification. Buildings don't support load requirements, they resist loads. Also, the proposal clarifies that the analysis applies to the final, not pre-alteration, condition

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

This code change was heard by the IBC Structural Code Development Committee.

Committee Action:

Approved as Submitted

Committee Reason: This is primarily an editorial change that rewords the requirements for a structural analysis of an existing building to make the intent of the code more clear.

Assembly Action:

None

Final Hearing Results

G216-07/08

AS

Code Change No: **G218-07/08**

Original Proposal

Sections: 3410.6.2 (IEBC [B] 1301.6.2), 3410.6.2.1 (IEBC [B] 1301.6.2.1)

Proponent: Maureen Traxler, City of Seattle, WA, representing the Department of Planning and Development

Revise as follows:

3410.6.2 (IEBC [B] 1301.6.2) Building area. The value for building area shall be determined by the formula in Section 3410.6.2.2. Section 503 and the formula in Section 3410.6.2.1 shall be used to determine the allowable area of the building. This shall include any allowable increases due to ~~frontage open perimeter~~ and automatic sprinklers as provided for in Section 506. Subtract the actual building area from the allowable area and divide by 1,200 square feet (112 m2). Enter the area value and its sign (positive or negative) in Table 3410.7 under Safety Parameter 3410.6.2, Building Area, for fire safety, means of egress and general safety. In determining the area value, the maximum permitted positive value for area is 50 percent of the fire safety score as listed in Table 3410.8, Mandatory Safety Scores.

3410.6.2.1 (IEBC [B] 1301.6.2.1) Allowable area formula. The following formula shall be used in computing allowable area:

$$AA = \left(\frac{(SP + OP + 100) \times (Area, Table 503)}{100} \right) \quad \text{Equation 34-2}$$

$$A_a = (1 + I_f + I_s) \times A_t$$

where:

AA- A_a = Allowable area.SP- I_s = ~~Area Percent~~ increase factor for sprinklers (Section 506.3).OP- I_f = ~~Area Percent~~ increase factor for ~~frontage open perimeter~~ (Section 506.2).

Reason: This proposal updates Equation 34-2 to be consistent with the manner in which allowable building area is calculated in IBC Equations 5-1 and 5-2. In the 2006 IBC, I_f and I_s are no longer expressed as percentages.

Cost Impact: This code change does not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Modified

Modify proposal as follows:

3410.6.2.1 (IEBC [B] 1301.6.2.1) Allowable area formula. The following formula shall be used in computing allowable area:

$$A_a = (1 + I_f + I_s) \times A_t \quad \text{(Equation 34-2)}$$

where:

 A_a = Allowable area. A_t = Tabular area per story in accordance with Table 503 (square feet)

CODE CHANGES RESOURCE COLLECTION – INTERNATIONAL BUILDING CODE

I_s = Area increase factor for sprinklers (Section 506.3).
 I_f = Area increase factor for frontage (Section 506.2).

Committee Reason: The proposal correlates the equations in Chapter 34 with that of current Section 506.1. The modification simply added a key for At that was inadvertently not included in the proposal.

Assembly Action:

None

Final Hearing Results

G218-07/08

AM

Code Change No: G219-07/08

Original Proposal

Sections: 3410.6.6, Table 3410.6.6(2) (IEBC [B] 1301.6.6, Table 1301.6.6(2))

Proponent: Daniel E. Nichols PE, New York State Division of Code Enforcement and Administration, Albany, NY

Revise as follows:

3410.6.6 (IEBC [B] 1301.6.6) Vertical openings. Evaluate the fire-resistance rating of exit enclosures, hoistways, escalator openings, and other shaft enclosures within the building, and openings between two or more floors. Table 3410.6.6(1) contains the appropriate protection values. Multiply that value by the construction type factor found in Table 3410.6.6(2). Enter the vertical opening value and its sign (positive or negative) in Table 3410.7 under Safety Parameter 3410.6.6, Vertical Openings, for fire safety, means of egress, and general safety. If the structure is a one-story building, enter a value of 2, or if all the unenclosed vertical openings that within the building conform to the requirements of Section 707, enter a value of 2. The maximum positive value for this requirement shall be 2. ~~shall not be considered in the evaluation of vertical openings.~~

**TABLE 3410.6.6(2) (IEBC TABLE 1301.6.6(2))
 CONSTRUCTION-TYPE FACTOR**

F A C T O R	TYPE OF CONSTRUCTION								
	IA	IB	IIA	IIB	IIIA	IIIB	IV	IIIA/VA	IIIB/VB
	1.2	1.5	2.2	3.5	2.5 <u>3.3</u>	3.5 <u>7</u>	2.3	3.3	7

Reason: The purpose of this code change proposal is correct the calculation of points regarding the protection of vertical openings in existing buildings, or lack thereof. The scope of this code change is to further quantify the benefits or hazards associated with vertical openings by limiting the benefit to the same level of not having them at all and to align similar construction types regarding interior construction.

First, Section 3410.6.6 has been modified to align conditions that meet or exceed vertical opening requirements in new buildings with that of buildings with no shafts at all. The current language would give a one-story Type VB building a +2 score but a Type VB two-story building with a one-hour rated shaft +7 points. Clearly, the addition of a rated shaft does not provide any additional fire protection when compared to not having a shaft at all. Furthermore, the current language gives a four story type IA building with a two-hour rated shaft a vertical opening score of +2.4 and a Type VB a vertical opening score of +14. This proposal limits the benefit points to the same score that one-story buildings receive.

The modification of Table 3410.6.6(2) addresses a non-consistent regulation of identical interior conditions. Table 3410.6.6(2) currently permits Type III buildings to not receive as severe of a negative score for unprotected vertical openings as a Type V building, even though IBC Section 602 permits the interior of a Type III and a Type V building to be constructed of identical materials. The current assumption in Table 3410.6.6(2) is that Type III buildings offer superior fire performance in interior vertical openings over Type V, which is not the case. The proposal aligns the Type III buildings to their Type V counterparts, relative to fire-resistance rating values.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: Increasing the construction type factor was felt to be too restrictive for existing buildings.

Assembly Action:

None

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because public comments were submitted.

Public Comment 1:

Daniel E. Nichols, PE, New York State Division of Code Enforcement and Administration, Albany, NY, requests Approval as Modified by this public comment.

Replace proposal as follows:

3410.6.6 (IEBC [B] 1301.6.6) Vertical openings. Evaluate the fire-resistance rating of exit enclosures, hoistways, escalator openings, and other shaft enclosures within the building, and openings between two or more floors. Table 3410.6.6(1) contains the appropriate protection values. Multiply that value by the construction type factor found in Table 3410.6.6(2). Enter the vertical opening value and its sign (positive or negative) in Table 3410.7 under Safety Parameter 3410.6.6, Vertical Openings, for fire safety, means of egress, and general safety. If the structure is a one-story building, ~~enter a value of 2, or if all the unenclosed vertical openings that within the building conform to the requirements of Section 707, enter a value of 2. The maximum positive value for this requirement shall be 2.~~ ~~shall not be considered in the evaluation of vertical openings.~~

Commenter's Reason: The original code proposal was actually two separate code change topics that were combined together. Since the opposition to the code proposal was to only one part of this change, the code change has been split into two public comments for consideration by the ICC voting membership.

This code proposal, as modified above, received no opposition from the floor or code development committee. The proposal is very simple in limiting the amount of positive points given for the protection vertical openings in buildings undergoing reuse or rehabilitation.

To express the point, I have prepared the following table to compare values compiled from Equation 34-4 (Section 3410.6.6.1):

# Stories	Construction Type	Protection of Vertical Openings	Vertical Opening Value
1	All	All	+2
3	IIB	1	+3.5
3	VB	2	+14

What this table is stating is that a one story building (with no hazards from vertical smoke spread) has a value of +2 and an unprotected wood-frame building with three stories in height utilizing a two-hour shaft gets +21 points. Even if the Type VB building put in protection meeting Section 707 for new construction, that would still give the building a +7 point benefit or 5 additional points over the level of no hazard.

By accepting this code proposal, this will still provide a disincentive for not having vertical openings protected but limit the maximum benefit to the same level as a one-story building.

Final Hearing Results

G219-07/08

AMPC1

Code Change No: **G221-07/08**

Original Proposal

Chapter 35

Proponent: Standards writing organizations as listed below.

Revise standards as follows:

ALI

Automotive Lift Institute
P. O. Box 85
Cortland, NY 13045

Standard
reference
number

Title

ALI ALCTV— 2006
98

Standard for Automobile Lifts—Safety Requirements for Construction, Testing and Validation (ANSI)

ASME

American Society of Mechanical Engineers
Three Park Avenue
New York, NY 10016-5990

Standard
reference
number

Title

A17.1/CSA B44-2007
2004

Safety Code for Elevators and Escalators

A18.1-2005 ~~03~~

Safety Standard for Platform Lifts and Stairway Chairlifts

A112.19.8M—
1987(R1996)

Suction Fittings for Use in Swimming Pools, Wading Pools, Spas, Hot Tubs, and Whirlpool Bath Tub Appliances

A112.19.17—2002

Manufactured Safety Vacuum Release Systems (SVRS) for Residential and Commercial Swimming Pool, Spa, Hot Tub and Wading Pool
Suction Systems

B20.1—~~2006~~ 2003

Safety Standard for Conveyors and Related Equipment

ASTM

ASTM International
100 Barr Harbor Drive
West Conshocken, PA 19428-2959

Standard
reference
number

Title

C 94/C 94M- 07 ~~05~~

Specification for Ready-Mixed Concrete

D 86-07a ~~05~~

Test Method for Distillation of Petroleum Products at Atmospheric Pressure

D 93—07 ~~02a~~

Test Method for Flash Point By Pensky-Martens Closed Cup Tester

NFPA

National Fire Protection Association
1 Batterymarch Park
Quincy, MA 02269-9101

Standard
reference
number

Title

32—07 ~~04~~

Dry Cleaning Plants

40—07 ~~04~~

Storage and Handling of Cellulose Nitrate Film

85—07 ~~04~~

Boiler and Combustion System Hazards Code

110-05 02	Emergency and Standby Power Systems
111-05 04	Stored Electrical Energy Emergency and Standby Power Systems
655-07 04	Prevention of Sulfur Fires and Explosions
664-07 02	Prevention of Fires Explosions in Wood Processing and Woodworking Facilities
704- 07 04	Standard System for the Identification of the Hazards of Materials for Emergency Response

UL

Underwriters Laboratories Inc.
333 Pfingsten Road
Northbrook, IL 60062-2096

Standard
reference
number

Title

1975— 2006 96	Fire Test of Foamed Plastics Used for Decorative Purposes
2017—2000	Standards for General-Purpose Signaling Devices and Systems—with Revisions through June 2004 August 2005
2200— 04 98	Stationary Engine Generator Assemblies (Revisions through July 2004)

Reason: The *CP 28 Code Development Policy*, Section 4.5* requires the updating of referenced standards to be accomplished administratively, and be processed as a Code Change Proposal. In May 2007, a letter was sent to each developer of standards that are referenced in the International Codes, asking them to provide the ICC with a list of their standards in order to update to the current edition. Above is the received list of the referenced standards that are under the maintenance responsibility of the IBC General Committee.

***4.5 Updating Standards:** The updating of standards referenced by the Codes shall be accomplished administratively by the appropriate code development committee in accordance with these full procedures except that multiple standards to be updated may be included in a single proposal.

Public Hearing Results

Committee Action:**Approved as Submitted**

Committee Reason: The proposal appropriately updates to the most current edition of referenced standards within the IBC for sections related to the General Building Code requirements.

Assembly Action:**None**

Final Hearing Results

G221-07/08**AS**

Code Change No: G226-07/08

Original Proposal

Section: 3108.1**Proponent:** Edward L. Keith, APA – The Engineered Wood Association**Revise as follows:**

3108.1 (Supp) General. Towers shall be designed and constructed in accordance with the provisions of TIA-222.

Exception: Single freestanding poles used to support lightweight electrical equipment such as cell-phone antennas shall not be required to be non-combustible.

CODE CHANGES RESOURCE COLLECTION – INTERNATIONAL BUILDING CODE

Reason: 1. The proposed code change clarifies the intent of the building code.

2. Historically under the *Uniform Building Code* (1997 UBC, Section 1512, which exempted freestanding “towers” from the non-combustibility requirement provided they extended no more than 75 feet above grade) single, freestanding wood poles have been used for many years to support small, lightweight electronic equipment such as cell phone antennas. The current code is silent on the use of poles.

This code change seeks a clarification of the requirements of Section 3108 for single freestanding poles supporting lightweight electrical equipment such as cell phone antennas, based on many years of good performance in areas covered by the Uniform Building Code. Note that wood poles are used throughout the United States for high voltage electrical, cable, DSL, and telephone lines. In addition to the lines and often considerable stresses they impose on the poles, the poles are also very often used to support very heavy transformers, street lights, traffic signals and junction boxes. Even carrying electrical loads far greater than cell phone antennas, there has historically been no requirement for non-combustible construction for wood poles.

Requiring non-combustible construction for cell phone poles will greatly increase the cost of such items and yet not provide a single iota of public safety as a result. The clarification is requested to prevent the incorrect interpretation of Section 3108 to include single, wood poles supporting cell phone antennas, thus denying the use of an inexpensive solution to a common situation with a long history of excellent performance simply because wood is combustible. Applying Section 3108 is an unnecessary solution to a non-problem.

Cost Impact: The code change proposal will have no impact on the cost of construction and will decrease the cost of cell-phone towers.

Public Hearing Results

Committee Action:

Approved as Modified

Modify the proposal as follows:

3108.1 (Supp) General. Towers shall be designed and constructed in accordance with the provisions of TIA-222.

Exception: Single freestanding poles used to support ~~lightweight electrical equipment such as cell phone~~ antennas not greater than 70 feet (21336 mm) above grade shall not be required to be non-combustible.

Committee Reason: The proposal was approved based upon the proponent’s reason; that these types of towers were permitted under UBC and have a good safety record. The modification makes the reference more general to antennas as the description of “lightweight electrical equipment such as cell phone antennas” was potentially limiting for similar poles supporting other types of antennas.

Assembly Action:

None

Final Hearing Results

G226-07/08

AMPC

IBC – MEANS OF EGRESS

Code Change No: **E5-07/08**

Original Proposal

Sections: 1002.1 (IFC [B] 1002.1)

Proponent: Gerard Hathaway, New York State Department of State Building Codes Division, representing himself

Revise definitions as follows:

1002.1 (IFC [B] 1002.1) Definitions. The following words and terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

BLEACHERS. Tiered seating facilities supported on a dedicated structural system and two or more rows high and is not a building element (see Grandstands).

FOLDING AND TELESCOPIC SEATING. Tiered seating facilities having an overall shape and size that are capable of being reduced for purposes of moving or storing and is not a building element.

GRANDSTAND. Tiered seating facilities supported on a dedicated structural system and two or more rows high and is not a building element (see Bleachers).

Reason: Bleachers, Grandstands and Folding and Telescopic Seating are addressed in ICC 300. The 2007 edition has been approved as the referenced document for the 2009 IBC. The definitions should be coordinated in both documents so that it is clear when the standard is applicable.

The definitions in the current IBC were submitted by the ICC 300 Development Committee in E68-02 and were based on the definitions in the 2002 edition of the ICC 300.

The purpose of the revised definition is to clarify that bleachers and grandstands are limited to items that are separate, independent structures from the buildings that they may be constructed within or from spaces constructed under or over (e.g. concessions booths, toilets, roofs). The ICC 300 is not intended to be utilized for single row seating that is supported directly by the floor system. . "And is not a building element" is proposed to be added to the three definitions to address the concerns that were expressed during last year's testimony that the proposed definitions needed this additional clarification. This definition for "building element" was added by FS4-07/08.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The revised definitions clarify applicability and coordinates with Standard ICC 300 *Bleachers, Grandstands and Folding and Telescopic Seating*.

Assembly Action:

None

Final Hearing Results

E5-07/08

AS

Code Change No: **E7-07/08**

Original Proposal

Sections: 1002.1, 1020.1.1, 1021.4 (IFC [B] 1002.1, [B] 1020.1.1, [B] 1021.4)

Proponent: Philip Brazil, PE, Reid Middleton, Inc., representing himself

Revise as follows:

1002.1 (IFC [B] 1002.1) Definitions. The following words and terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

EXIT. That portion of a means of egress system which is separated from other interior spaces of a building or structure by fire-resistance-rated construction and opening protectives as required to provide a protected path of egress travel between the exit access and the exit discharge. Exits include exterior exit doors at ground level, exit enclosures, exit passageways, exterior exit ~~stairs~~ stairways, exterior exit ramps and horizontal exits.

EXIT PASSAGEWAY. An exit component that is separated from all other interior spaces of a building or structure by fire-resistance-rated construction and opening protectives, and provides for a protected path of egress travel in a horizontal direction to the exit discharge or the public way.

1020.1.1 (IFC [B] 1020.1.1) Openings and penetrations. Exit enclosure opening protectives shall be in accordance with the requirements of Section 715.

~~Except as permitted in Section 402.4.6, openings~~ Openings in exit enclosures other than unprotected exterior openings shall be limited to those necessary for exit access to the enclosure from normally occupied spaces and for egress from the enclosure.

Where interior exit enclosures are extended to the exterior of a building by an exit passageway, the door assembly from the exit enclosure to the exit passageway shall be protected by a fire door assembly ~~conforming to~~ complying with the requirements in Section 715.4. Fire door assemblies in exit enclosures shall comply with Section 715.4.4.

Elevators shall not open into an exit enclosure.

1021.4 (IFC [B] 1021.4) Openings and penetrations. Exit passageway opening protectives shall be in accordance with the requirements of Section 715.

~~Except as permitted in Section 402.4.6, openings~~ in exit passageways other than ~~unexposed~~ unprotected exterior openings shall be limited to those necessary for exit access to the exit passageway from normally occupied spaces and for egress from the exit passageway.

Where interior exit enclosures are extended to the exterior of a building by an exit passageway, the door assembly from the exit enclosure to the exit passageway shall be protected by a fire door assembly conforming to ~~complying with~~ the requirements in Section 715.4. Fire door assemblies in exit passageways shall comply with Section 715.4.4.

Elevators shall not open into an exit passageway.

Reason: The purpose for this proposal is primarily editorial and was prepared in conjunction with related proposals on definitions of the means of egress components, the technical provisions for smokeproof enclosures and pressurized stairways, and exit passageways used to extend exit enclosures to an exit discharge or a public way. In the definition for “exit” in Section 1002.1, exterior exit “stairs” is changed to “stairways” for consistency with the provisions of Section 1022 on exterior exit ramps and stairways. In the definition for “exit passageway” in Section 1002.1, “all” is deleted for consistency with similar language in the definition for “exit enclosure and to eliminate what is judged to be superfluous.

The reference to Section 402.4.6 in the second paragraph of Section 1020.1.1 is deleted because it is not applicable to exit enclosures. Section 402.4.6 applies to service areas opening into exit passageways in covered mall buildings and is appropriately referenced in the second paragraph of Section 1021.4 on exit passageways.

In the third paragraph of Sections 1020.1.1 and 1021.4, “conforming to” is changed to “complying with” to eliminate nonmandatory language. In the second paragraph of Section 1021.4, “unexposed” is changed to “unprotected” for consistency with similar language in the second paragraph of Section 1020.1.1 and to eliminate a term that is vague and unenforceable. In the third paragraph of Section 1021.4, “fire door” is changed to “fire door assembly” for consistency with similar language in the third paragraph of Section 1020.1.1 and with the reference to “door assembly” in the same sentence of each code section.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:**Approved as Modified****Modify the proposal as follows:**

1021.4 (IFC [B] 1021.4) Openings and penetrations. Exit passageway opening protectives shall be in accordance with the requirements of Section 715.

Except as permitted in Section 402.4.6, openings in exit passageways other than ~~unprotected~~ exterior openings shall be limited to those necessary for exit access to the exit passageway from normally occupied spaces and for egress from the exit passageway.

Where interior exit enclosures are extended to the exterior of a building by an exit passageway, the door assembly from the exit enclosure to the exit passageway shall be protected by a fire door assembly complying with the requirements in Section 715.4. Fire door assemblies in exit passageways shall comply with Section 715.4.4.

Elevators shall not open into an exit passageway.

(Portions of proposal not shown remain unchanged)

Committee Reason: The further modification to Section 1021.4 was to delete 'unprotected'. The topic is exterior openings, therefore, this is a fire separation distance issue, so deleting the current term 'unexposed' as well as the proposed 'unprotected' is more consistent with the language in the code. The entire proposal was approved because consistency between Sections 1020 and 1021.

Assembly Action:**None**

Final Hearing Results

E7-07/08

AM

Code Change No: E8-07/08

Original Proposal

Sections: 405.1, 405.4.1, 405.8.2, 1020.1.7 (IFC [B] 1020.1.7); IFC 903.2.1, 907.2.18 (IBC [F] 903.2.1, [F] 907.2.18); IEBC 705.4.3.1, 705.9, 705.10, 803.1

Proponent: Marshall A. Klein, Marshall A. Klein & Associates, Inc

THESE PROPOSALS ARE ON THE AGENDA OF THE IBC MEANS OF EGRESS, IFC AND THE IEBC CODE DEVELOPMENT COMMITTEES AS 3 SEPARATE CODE CHANGES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IBC MEANS OF EGRESS**Revise as follows:**

**SECTION 405
UNDERGROUND BUILDINGS**

405.1 (Supp) General. The provisions of this section apply to building spaces having a floor level used for human occupancy more than 30 feet (9144 mm) below the finished floor of the lowest level of exit discharge.

Exceptions:

1. One- and two-family dwellings, sprinklered in accordance with Section 903.3.1.3.
2. Parking garages with automatic sprinkler systems in compliance with Section 405.3.
3. Fixed guideway transit systems.
4. Grandstands, bleachers, stadiums, arenas and similar facilities.

5. Where the lowest story is the only story that would qualify the building as an underground building and has an area not exceeding 1,500 square feet (139 m²) and has an occupant load less than 10.
6. Pumping stations and other similar mechanical spaces intended only for limited periodic use by service or maintenance personnel.

405.4 Compartmentation. Compartmentation shall be in accordance with Sections 405.4.1 through 405.4.3.

405.4.1 Number of compartments. A building having a floor level more than 60 feet (18 288 mm) below the finished floor of the lowest level of exit discharge shall be divided into a minimum of two compartments of approximately equal size. Such compartmentation shall extend through the highest level of exit discharge serving the underground portions of the building and all levels below.

Exception: The lowest story need not be compartmented where the area does not exceed 1,500 square feet (139 m²) and has an occupant load of less than 10.

405.8.2 Smokeproof enclosure. Every required stairway serving floor levels more than 30 feet (9144 mm) below the finished floor of its level of exit discharge shall comply with the requirements for a smokeproof enclosure as provided in Section 1020.1.7.

1020.1 (IFC [B] 1020.1) (Supp) Enclosures required. Interior exit stairways and interior exit ramps shall be enclosed with fire barriers constructed in accordance with Section 706 or horizontal assemblies constructed in accordance with Section 711, or both. Exit enclosures shall have a fire-resistance rating of not less than 2 hours where connecting four stories or more and not less than 1 hour where connecting less than four stories. The number of stories connected by the exit enclosure shall include any basements but not any mezzanines. Exit enclosures shall have a fire-resistance rating not less than the floor assembly penetrated, but need not exceed 2 hours. An exit enclosure shall not be used for any purpose other than means of egress.

Exceptions:

1. In all occupancies, other than Group H and I occupancies, a stairway is not required to be enclosed when the stairway serves an occupant load of less than 10 and the stairway complies with either Item 1.1 or 1.2. In all cases, the maximum number of connecting open stories shall not exceed two.
 - 1.1. The stairway is open to not more than one story above ~~the story at~~ the level of exit discharge; or
 - 1.2. The stairway is open to not more than one story below ~~the story at~~ the level of exit discharge.
2. Exits in buildings of Group A-5 where all portions of the means of egress are essentially open to the outside need not be enclosed.
3. Stairways serving and contained within a single residential dwelling unit or sleeping unit in Group R-1, R-2 or R-3 occupancies are not required to be enclosed.
4. Stairways in open parking structures that serve only the parking structure are not required to be enclosed.
5. Stairways in Group I-3 occupancies, as provided for in Section 408.3.6, are not required to be enclosed.
6. Means of egress stairways as required by Section 410.5.3 are not required to be enclosed.
7. Means of egress stairways from balconies, galleries and press boxes as provided for in Section 1025.5.1, are not required to be enclosed.

1020.1.7 (IFC [B] 1020.1.7) Smokeproof enclosures. In buildings required to comply with Section 403 or 405, each of the exits of a building that serves stories where the floor surface is located more than 75 feet (22 860 mm) above the lowest level of fire department vehicle access or more than 30 feet (9144 mm) below the finished floor of the level of exit discharge serving such floor levels shall be a smokeproof enclosure or pressurized stairway in accordance with Section 909.20.

PART II – IFC

Revise as follows:

903.2.1 (IBC [F] 903.2.1) (Supp) Group A. An automatic sprinkler system shall be provided throughout buildings and portions thereof used as Group A occupancies as provided in this section. For Group A-1, A-2, A-3 and A-4 occupancies, the automatic sprinkler system shall be provided throughout the floor area where the Group A-1, A-2, A-3 or A-4 occupancy is located, and in all floors ~~between from~~ the Group A occupancy ~~and to, and including,~~ the nearest level of exit discharge serving the Group A occupancy. For Group A-5 occupancies, the automatic sprinkler system shall be provided in the spaces indicated in Section 903.2.1.5.

907.2.18 (IBC [F] 907.2.18) (Supp) Deep underground buildings. Where the lowest level of a structure is more than 60 feet (18 288 mm) below the finished floor of the lowest level of exit discharge, the structure shall be equipped throughout with a manual fire alarm system, including an emergency voice/alarm communication system installed in accordance with Section 907.6.2.2.

PART III – IEBC

Revise as follows:

705.4.3.1 Supplemental requirements for door closing. Where the work area exceeds 50 percent of the floor area, doors shall comply with Section 705.4.3 throughout the exit stair from the work area to, and including, the level of exit discharge.

705.9 Handrails. The requirements of Section 705.9.1 and 705.9.2 shall apply to handrails from the work area floor to, and including, the level of exit discharge.

705.10 Guards. The requirements of Sections 705.10.1 and 705.10.2 shall apply to guards from the work area floor to, and including, the level of exit discharge but shall be confined to the egress path of any work area.

803.1 Existing shafts and vertical openings. Existing stairways that are part of the means of egress shall be enclosed in accordance with Section 703.2.1 ~~between~~ from the highest work area floor to, and including, the level of exit discharge and all floors below.

Reason: This code proposal is intended to be editorial in nature. My approved code proposal, E5-06/07, revised the definition of “Level of exit discharge” last cycle to read as follows:

EXIT DISCHARGE, LEVEL OF. The ~~horizontal plane located~~ story at the point at which an exit terminates and an exit discharge begins.

With the above clarification of the definition of “level of exit discharge” in the 2007 I Codes Supplement, I reviewed all instances in the I Codes for the use of “level of exit discharge” for consistency with its past intended use as follows:

1. Code provisions under Items IBC/IFC Section 903.2.1, and IEBC Section 705.4.3.1, 705.0, 705.10 and 803.1, needed revisions for clarification by adding the verbiage such as “...including...” the level of exit discharge in order to include the “level of exit discharge” since the level of exit discharge definition was changed from a “horizontal plane” to a “story”.

2. One code provision under IBC/IFC 1020.1 that needed the verbiage “...the story at...” removed since the definition of LED is now defined as a “story” and not a “horizontal plane”.

3. Code provisions under IBC 405.1, 405.4.1, 405.8.2, and IBC/IFC 907.2.19 and 1020.1.7, that needed clarification of the vertical measurement in feet to the LED when a floor is below the LED by including the verbiage “...below the finished floor of the level of exit discharge...”.

It is not my intent to change any of these existing requirements in the Code as they relate to the “level of exit discharge”. Last year’s code proposal, E5-06/07, along with this year’s revisions to the above noted code sections, will complete the correlation of the I Codes’ definition for “level of exit discharge” with the definition in NFPA 101, where the “level of exit discharge” concept originally came from.

Cost Impact: This code change proposal will not increase the cost of construction.

Public Hearing Results

PART I – IBC MEANS OF EGRESS

Committee Action:

Approved as Submitted

Committee Reason: The proposal will correlate sections throughout the code with the definition of ‘level of exit discharge’. This would be consistent with the committee action on E5-06/07 which revised the definition.

Assembly Action:

None

PART II – IFC

Committee Action:

Approved as Submitted

Committee Reason: For consistency with the action taken by the IBC-MOE and IEBC Committees. The proposal eliminates the previously existing confusion in establishing a correct point of measurement that these sections posed.

Assembly Action:

None

PART III – IEBC

Committee Action:

Approved as Submitted

Committee Reason: This code change picks up language that correlates with a previous code change (E5-06/07) in the 2006/2007 Code Change Cycle.

Assembly Action:

None

Final Hearing Results

E8-07/08, Part I	AS
E8-07/08, Part II	AS
E8-07/08, Part III	AS

Code Change No: E10-07/08

Original Proposal

Sections: 308.5.2 (IFC [B] 202), 1006.3 (IFC [B] 1006.3), 1007.2.1 (IFC [B] 1007.2.1), 1020.1 (IFC [B] 1020.1), 1020.1.5 (IFC [B] 1020.1.5), 1020.1.7 (IFC [B] 1020.1.7), 1023.6 (IFC [B] 1023.6), 1024.1 (IFC [B] 1024.1); IFC 903.2.1.1- 903.2.1.4 (IBC [F] 903.2.1.1- 903.2.1.4), 903.2.2 (IBC [F] 903.2.2), 1027.5, 1027.18, 1027.19

Proponent: Philip Brazil, PE, Reid Middleton, Inc., representing himself

THESE PROPOSALS ARE ON THE AGENDA OF THE IBC MEANS OF EGRESS AND THE IFC CODE DEVELOPMENT COMMITTEES AS 2 SEPARATE CODE CHANGES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I — IBC MEANS OF EGRESS

Revise as follows:

308.5.2 (IFC [B] 202) Child care facility. A facility that provides supervision and personal care on less than a 24-hour basis for more than five children 2-1/2 years of age or less shall be classified as Group I-4.

Exception: A child day care facility that provides care for more than five but no more than 100 children 2-1/2 years or less of age, ~~when~~ where the rooms ~~where such~~ in which the children are cared for are located on ~~the~~ a level of exit discharge servicing such rooms and each of these child care rooms has an exit door directly to the exterior, shall be classified as Group E.

1006.3 (IFC [B] 1006.3) Illumination emergency power. The power supply for means of egress illumination shall normally be provided by the premise's electrical supply.

In the event of power supply failure, an emergency electrical system shall automatically illuminate all of the following areas:

1. Aisles and unenclosed egress stairways in rooms and spaces that require two or more means of egress.
2. Corridors, exit enclosures and exit passageways in buildings required to have two or more exits.
3. Exterior egress components at other than ~~the~~ their levels of exit discharge until exit discharge is accomplished for buildings required to have two or more exits.
4. Interior exit discharge elements, as permitted in Section 1024.1, in buildings required to have two or more exits.
5. Exterior landings as required by Section 1008.1.5 for exit discharge doorways in buildings required to have two or more exits.

The emergency power system shall provide power for a duration of not less than 90 minutes and shall consist of storage batteries, unit equipment or an on-site generator. The installation of the emergency power system shall be in accordance with Section 2702.

1007.2.1 (IFC [B] 1007.2.1) Elevators required. In buildings where a required accessible floor is four or more stories above or below a level of exit discharge, at least one required accessible means of egress shall be an elevator complying with Section 1007.4.

Exceptions:

1. In buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2, the elevator shall not be required on floors provided with a horizontal exit and located at or above the levels of exit discharge.
2. In buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2, the elevator shall not be required on floors provided with a ramp conforming to the provisions of Section 1010.

1020.1 (IFC [B] 1020.1) (Supp) Enclosures required. Interior exit stairways and interior exit ramps shall be enclosed with fire barriers constructed in accordance with Section 706 or horizontal assemblies constructed in accordance with Section 711, or both. Exit enclosures shall have a fire-resistance rating of not less than 2 hours where connecting four stories or more and not less than 1 hour where connecting less than four stories. The number of stories connected by the exit enclosure shall include any basements but not any mezzanines. Exit enclosures shall have a fire-resistance rating not less than the floor assembly penetrated but need not exceed 2 hours. An exit enclosure shall not be used for any purpose other than means of egress.

Exceptions:

1. In all occupancies other than Groups H and I occupancies, a stairway is not required to be enclosed when the stairway serves an occupant load of less than 10 and the stairway complies with either Item 1.1 or 1.2. In all cases, the maximum number of connecting open stories shall not exceed two.
 - 1.1. The stairway is open to not more than one story above the story at the its level of exit discharge, or
 - 1.2. The stairway is open to not more than one story below the story at the its level of exit discharge.
2. Exits in buildings of Group A-5 where all portions of the means of egress are essentially open to the outside need not be enclosed.
3. Stairways serving and contained within a single residential dwelling unit or sleeping unit in Group R-1, R-2 or R-3 occupancies are not required to be enclosed.
4. Stairways in open parking structures that serve only the parking structure are not required to be enclosed.
5. Stairways in Group I-3 occupancies, as provided for in Section 408.3.6, are not required to be enclosed.
6. Means of egress stairways as required by Section 410.5.3 are not required to be enclosed.
7. Means of egress stairways from balconies, galleries and press boxes as provided for in Section 1025.5.1, are not required to be enclosed.

1020.1.5 (IFC [B] 1020.1.5) Discharge identification. A stairway in an exit enclosure shall not continue below the its level of exit discharge unless an approved barrier is provided at the level of exit discharge to prevent persons from unintentionally continuing into levels below. Directional exit signs shall be provided as specified in Section 1011.

1020.1.7 (IFC [B] 1020.1.7) Smokeproof enclosures. In buildings required to comply with Section 403 or 405, each of the exits of a building that serves stories where the floor surface is located more than 75 feet (22 860 mm) above the lowest level of fire department vehicle access or more than 30 feet (9144 mm) below the a level of exit discharge serving such floor levels shall be a smokeproof enclosure or pressurized stairway in accordance with Section 909.20.

1023.6 (IFC [B] 1023.6) Exterior ramps and stairway protection. Exterior exit ramps and stairways shall be separated from the interior of the building as required in Section 1020.1. Openings shall be limited to those necessary for egress from normally occupied spaces.

Exceptions:

1. Separation from the interior of the building is not required for occupancies, other than those in Group R-1 or R-2, in buildings that are no more than two stories above grade plane where the a level of exit discharge servng such occupancies is the first story above grade plane.
2. Separation from the interior of the building is not required where the exterior ramp or stairway is served by an exterior ramp and/or balcony that connects two remote exterior stairways or other approved exits, with a perimeter that is not less than 50 percent open. To be considered open, the opening shall be a minimum of 50 percent of the height of the enclosing wall, with the top of the openings no less than 7 feet (2134 mm) above the top of the balcony.

3. Separation from the interior of the building is not required for an exterior ramp or stairway located in a building or structure that is permitted to have unenclosed interior stairways in accordance with Section 1020.1.
4. Separation from the interior of the building is not required for exterior ramps or stairways connected to open-ended corridors, provided that Items 4.1 through 4.4 are met:
 - 4.1. The building, including corridors and ramps and/or stairs, shall be equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2.
 - 4.2. The open-ended corridors comply with Section 1017.
 - 4.3. The open-ended corridors are connected on each end to an exterior exit ramp or stairway complying with Section 1023.
 - 4.4. At any location in an open-ended corridor where a change of direction exceeding 45 degrees (0.79 rad) occurs, a clear opening of not less than 35 square feet (3.3 m²) or an exterior ramp or stairway shall be provided. Where clear openings are provided, they shall be located so as to minimize the accumulation of smoke or toxic gases.

1024.1 (IFC [B] 1024.1) (Supp) General. Exits shall discharge directly to the exterior of the building. The exit discharge shall be at grade or shall provide direct access to grade. The exit discharge shall not reenter a building.

Exceptions:

1. A maximum of 50 percent of the number and capacity of the exit enclosures is permitted to egress through areas on the level of discharge provided all of the following are met:
 - 1.1. Such exit enclosures egress to a free and unobstructed way to the exterior of the building, which way is readily visible and identifiable from the point of termination of the exit enclosure.
 - 1.2. The entire area of the level of discharge is separated from areas below by construction conforming to the fire-resistance rating for the exit enclosure.
 - 1.3. The egress path from the exit enclosure on the level of discharge is protected throughout by an approved automatic sprinkler system. All portions of the level of discharge with access to the egress path shall either be protected throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2, or separated from the egress path in accordance with the requirements for the enclosure of exits.
2. A maximum of 50 percent of the number and capacity of the exit enclosures is permitted to egress through a vestibule provided all of the following are met:
 - 2.1. The entire area of the vestibule is separated from areas below by construction conforming to the fire-resistance rating for the exit enclosure.
 - 2.2. The depth from the exterior of the building is not greater than 10 feet (3048 mm) and the length is not greater than 30 feet (9144 mm).
 - 2.3. The area is separated from the remainder of the level of exit discharge by construction providing protection at least the equivalent of approved wired glass in steel frames.
 - 2.4. The area is used only for means of egress and exits directly to the outside.
3. Stairways in open parking garages complying with Section 1020.1, Exception 5, are permitted to egress through the open parking garage at ~~the~~ their levels of exit discharge.
4. Horizontal exits complying with Section 1022 shall not be required to discharge directly to the exterior of the building.

PART II — IFC

Revise as follows:

903.2.1.1 (IBC [F] 903.2.1.1) Group A-1. An automatic sprinkler system shall be provided for Group A-1 occupancies where one of the following conditions exists:

1. The fire area exceeds 12,000 square feet (1115 m²).
2. The fire area has an occupant load of 300 or more.
3. The fire area is located on a floor other than ~~the~~ a level of exit discharge servicing such occupancies.
4. The fire area contains a multitheater complex.

903.2.1.2 (IBC [F] 903.2.1.2) Group A-2. An automatic sprinkler system shall be provided for Group A-2 occupancies where one of the following conditions exists:

1. The fire area exceeds 5,000 square feet (464.5m²).
2. The fire area has an occupant load of 100 or more.
3. The fire area is located on a floor other than ~~the~~ a level of exit discharge servicing such occupancies.

903.2.1.3 (IBC [F] 903.2.1.3) Group A-3. An automatic sprinkler system shall be provided for Group A-3 occupancies where one of the following conditions exists:

1. The fire area exceeds 12,000 square feet (1115 m²).
2. The fire area has an occupant load of 300 or more.
3. The fire area is located on a floor other than ~~the~~ a level of exit discharge servicing such occupancies.

Exception: Areas used exclusively as participant sports areas where the main floor area is located at the same level as the level of exit discharge of the main entrance and exit.

903.2.1.4 (IBC [F] 903.2.1.4) Group A-4. An automatic sprinkler system shall be provided for Group A-4 occupancies where one of the following conditions exists:

1. The fire area exceeds 12,000 square feet (1115m²).
2. The fire area has an occupant load of 300 or more.
3. The fire area is located on a floor other than ~~the~~ a level of exit discharge servicing such occupancies.

Exception: Areas used exclusively as participant sports areas where the main floor area is located at the same level as the level of exit discharge of the main entrance and exit.

903.2.2 (IBC [F] 903.2.2) (Supp) Group E. An automatic sprinkler system shall be provided for Group E occupancies as follows:

1. Throughout all Group E fire areas greater than 20,000 square feet (1858 m²) in area.
2. Throughout every portion of educational buildings below the lowest level of exit discharge ~~that serves~~ servicing that portion of the building.

Exception: An automatic sprinkler system is not required in any ~~fire area or~~ area below the lowest level of exit discharge servicing that area where every classroom throughout the building has at least one exterior exit door at ground level.

1027.5 Illumination emergency power. The power supply for means of egress illumination shall normally be provided by the premises' electrical supply. In the event of power supply failure, illumination shall be automatically provided from an emergency system for the following occupancies where such occupancies require two or more means of egress:

1. Group A having 50 or more occupants.

Exception: Assembly occupancies used exclusively as a place of worship and having an occupant load of less than 300.

2. Group B buildings three or more stories in height, buildings with 100 or more occupants above or below ~~the~~ a level of exit discharge servicing the occupants, or buildings with 1,000 or more total occupants.
3. Group E in interior stairs, corridors, windowless areas with student occupancy, shops and laboratories.
4. Group F having more than 100 occupants.

Exception: Buildings used only during daylight hours which are provided with windows for natural light in accordance with the *International Building Code*.

5. Group I.
6. Group M.

Exception: Buildings less than 3,000 square feet (279 m²) in gross sales area on one story only, excluding mezzanines.

7. Group R-1.

Exception: Where each sleeping unit has direct access to the outside of the building at grade.

8. Group R-2.

Exception: Where each dwelling unit or sleeping unit has direct access to the outside of the building at grade.

9. Group R-4.

Exception: Where each sleeping unit has direct access to the outside of the building at ground level. The emergency power system shall provide power for not less than 60 minutes and consist of storage batteries, unit equipment or an on-site generator. The installation of the emergency power system shall be in accordance with Section 604.

1027.18 Stairway discharge identification. A stairway in an exit enclosure which continues below ~~the~~ its level of exit discharge shall be arranged and marked to make the direction of egress to a public way readily identifiable.

Exception: Stairs that continue one-half story beyond ~~the~~ their levels of exit discharge need not be provided with barriers where the exit discharge is obvious.

1027.19 Exterior stairway protection. Exterior exit stairs shall be separated from the interior of the building as required in Section 1023.6. Openings shall be limited to those necessary for egress from normally occupied spaces.

Exceptions:

1. Separation from the interior of the building is not required for buildings that are two stories or less above grade where ~~the~~ a level of exit discharge servicing such occupancies is the first story above grade.
2. Separation from the interior of the building is not required where the exterior stairway is served by an exterior balcony that connects two remote exterior stairways or other approved exits, with a perimeter that is not less than 50 percent open. To be considered open, the opening shall be a minimum of 50 percent of the height of the enclosing wall, with the top of the opening not less than 7 feet (2134 mm) above the top of the balcony.
3. Separation from the interior of the building is not required for an exterior stairway located in a building or structure that is permitted to have unenclosed interior stairways in accordance with Section 1020.1.
4. Separation from the interior of the building is not required for exterior stairways connected to open-ended corridors, provided that:
 - 4.1. The building, including corridors and stairs, is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2.
 - 4.2. The open-ended corridors comply with Section 1017.
 - 4.3. The open-ended corridors are connected on each end to an exterior exit stairway complying with Section 1023.1.
 - 4.4. At any location in an open-ended corridor where a change of direction exceeding 45 degrees occurs, a clear opening of not less than 35 square feet (3 m²) or an exterior stairway shall be provided. Where clear openings are provided, they shall be located so as to minimize the accumulation of smoke or toxic gases.

Reason: This proposal is a continuation of Proposal F85-07/08-AMPC1. The reason statement accompanying the proposal pointed out that buildings on sloping sites often have more level of exit discharge. The proposal addressed references to “the level of exit discharge” in IFC Sections 903.2.1 and 903.2.2 but there are other sections in the IBC and IFC that contain the identical phrase. The purpose of this proposal is to adjust the phrase in those sections so that buildings with multiple levels of exit discharge are clearly accounted for while still preserving the current intent of their provisions.

“The” level of exit discharge in the Exception for child care facilities in IBC Section 308.5.2 and IFC Section 202 is changed to “a” level of exit discharge “servicing such rooms.” The change in occupancy classification from Group I-4 to Group E is dependent on the rooms used for the care of children being located on the level of exit discharge. The change will permit the rooms to be located on one of the levels of exit discharge serving the rooms. The other revisions are editorial, changing “when” to “where” in referring to the rooms providing the day care.

“The” level” of exit discharge in Exception #1 to IBC Section 1007.2.1 on elevators as accessible means of egress is changed to the “levels” of exit discharge. An elevator is required to be an accessible means of egress where the building is four or more stories above or below one of the levels of exit discharge. The change will make it clear that the elevator exemption is limited to floors at or above all the levels of exit discharge (i.e., prevent compliance based only on the higher of two levels of exit discharge). Note that “a” level of exit discharge is cited in the charging language and is unchanged in this proposal.

“The” level of exit discharge in IBC Section 1020.1.7 on smokeproof enclosures is changed to “a” level of exit discharge serving such floor levels. In high-rise and underground buildings, each exit serving a story whose floor surface is more than 30 feet below the level of exit discharge (one of two conditions) serving the story is required to be a smokeproof enclosure or pressurized stairway. The change will make it clear that the requirement applies to exits whose floor surfaces are more than 30 feet below any of the levels of exit discharge serving that story (i.e., prevent compliance based only on the higher of two levels of exit discharge).

“The” level of exit discharge in Exception #1 to IBC Section 1023.6 on protection of exterior ramps and stairways is changed to “a” level of exit discharge “servicing such occupancies.” Separation of exterior ramps and stairways from occupancies other than Group R-1 or R-2 is not required in buildings that are no more than two stories above grade plane where the level of exit discharge is the first story above grade plane. The change will permit the occupancies to be located on one of the levels of exit discharge serving the occupancies.

“The” level of exit discharge in Item #3 of IFC Sections 903.2.1.1, 903.2.1.2, 903.2.1.3 and 903.2.1.4 on automatic sprinkler systems in Group A occupancies is changed to “a” level of exit discharge “servicing such occupancies.” One of the three conditions for requiring an automatic sprinkler system in a Group A occupancy other than Group A-5 is that the fire area is located on a floor other than the level of exit discharge. The change will exempt the occupancy from the requirement provided it is located on a floor other than one of the levels of exit discharge serving the occupancy. Note that “the” level of exit discharge of the main entrance and exit is cited in the Exception to Sections 903.2.1.3 and 903.2.1.4 but is unchanged in this proposal.

The "level" of exit discharge in the Exception to IFC Section 903.2.2 on automatic sprinkler systems in Group E occupancies is changed to the "lowest" level of exit discharge "serving that area" for consistency with the requirement in Item #2 for which the Exception modifies. "Fire area" is deleted because it is seen as superfluous. The Exception currently applies to "areas" below the level of exit discharge, which include "fire areas." Note that Item #2 of Section 903.2.2 specifies the "lowest level of exit discharge that serves that portion of the building" and is unchanged in this proposal except for an editorial change for consistency with the proposed change to the Exception.

The "level of exit discharge" in the Exception to IFC Section 1027.5 on emergency power for egress illumination is changed to "a" level of exit discharge "serving the occupants." One of the conditions for requiring emergency power for egress illumination in existing buildings is that there are 100 or more occupants above or below the level of exit discharge. The change will exempt the building from the requirement provided there are less than 100 occupants above and below any of the levels of exit discharge serving any of the occupants (i.e., prevent compliance based only on the higher level of exit discharge for occupants below or the lower level of exit discharge for occupants above).

"The" level of exit discharge in Exception #1 to IFC Section 1027.19 on exterior stairway protection is changed to "a" level of exit discharge "serving such occupancies." Separation of exterior stairways from the interior is not required in buildings that are no more than two stories above grade when the level of exit discharge is the first story above grade. The change will permit the occupancies to be located on one of the levels of exit discharge serving the occupancies.

The provision of IBC Sections 1006.3 (Item 3); 1020.1 (Exception 1, Items 1.1 and 1.2); 1020.1.5; and 1024.1 (Exception 3); and IFC Section 1027.18 typically apply to exit stairways and other means of egress components with distinct levels of exit discharge. Multiple levels of exit discharge are not possible. The building, however, could have multiple levels of exit discharge. Consequently, "the" level of exit discharge is changed to "its level" or "their levels" of exit discharge depending on the context.

IBC Sections 405.1, 405.3, 405.4.1 and 405.8.2; IFC Table 405.2; and IFC Sections 404.2, 903.2.1, 907.2.2, 907.2.4, 907.2.7, 907.2.9.1, 907.2.18, 907.2.18.1 and 914.5.1; are not included in this proposal because they reference the lowest, highest or nearest level of exit discharge. IBC Section 1019.2 (Item 3) is not included because the subject of the provision is a single-level building.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

PART I – IBC MEANS OF EGRESS

Committee Action:

Approved as Submitted

Committee Reason: The revision clarifies how to use the definitions for 'level of exit discharge' and 'exit discharge.' The revisions in E8-07/08 to Section 1020.1, Exp 1.1 and 1.2 would still be applicable.

Assembly Action:

None

PART II – IFC

Committee Action:

Approved as Submitted

Committee Reason: For consistency with the action taken by the IBC-MOE Committee on Part I of this proposal and to provide correlation between the IBC Chapter 10 and the IFC egress provisions for existing buildings. The changes add clarity to the provisions.

Assembly Action:

None

Final Hearing Results

E10-07/08, Part I	AS
E10-07/08, Part II	AS

Code Change No: E11-07/08

Original Proposal

Sections: 1003.2 (IFC [B] 1003.2)

Proponent: John Berry, Cole + Russell Architects, Inc.

Revise as follows:

1003.2 (IFC [B] 1003.2) (Supp) Ceiling height. The means of egress shall have a ceiling height of not less than 7 feet 6 inches (2286 mm).

Exceptions:

1. Sloped ceilings in accordance with Section 1208.2.
2. Ceilings of dwelling units and sleeping units within residential occupancies in accordance with Section 1208.2.
3. Allowable projections in accordance with Section 1003.3.
4. Stair headroom in accordance with Section 1009.2.
5. Door height in accordance with Section 1008.1.1.
6. Ramp headroom in accordance with Section 1010.5.2.
7. The clear height of floor levels in vehicular and pedestrian traffic areas in parking garages in accordance with Section 406.2.2.

Reason: The intent of this proposal is to coordinate the new ceiling height requirements of this section with the clear floor height allowed in parking garages per Section 406.2.2. Without this exception, it can easily be interpreted that the clear floor height in parking garages is to be 7'-6". I have solicited the opinion of the ICC Staff on this issue and have received a response that Section 406.2.2 should be considered for this issue in parking garages.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The proposal correlates with the height for means of egress throughout parking garages. This is not a conflict with ICC A117.1 because of the reference in Section 406.2.2 for the accessible portion of the parking garage.

Assembly Action:

None

Final Hearing Results

E11-07/08

AS

Code Change No: E12-07/08

Original Proposal

Sections: 1003.2 (IFC [B] 1003.2)

Proponent: Maureen Traxler, City of Seattle, representing Washington Association of Building Officials Technical Code Development Committee

Revise as follows:

1003.2 (IFC [B] 1003.2) (Supp) Ceiling height. The means of egress shall have a ceiling height of not less than 7 feet 6 inches (2286 mm).

Exceptions:

1. Sloped ceilings in accordance with Section 1208.2.
2. Ceilings of dwelling units and sleeping units within residential occupancies in accordance with Section 1208.2.
3. Allowable projections in accordance with Section 1003.3.
4. Stair headroom in accordance with Section 1009.2.
5. Door height in accordance with Section 1008.1.1.
6. Ramp headroom in accordance with Section 1010.5.2.
7. Areas above and below mezzanine floors in accordance with Section 505.1.

Reason: This proposal resolves an inconsistency between Section 505.1 and 1003.2. The mezzanine provisions of Section 505.1 allow a ceiling height of 7 feet, but 1003.2 requires ceiling height of 7 feet 6 inches throughout the means of egress, which includes areas above and below mezzanines.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The proposal correlates with the height for mezzanines. There is no need to supersede the provision for a whole floor based on means of egress and the proposed additional exception clarifies that.

Assembly Action:

None

Final Hearing Results

E12-07/08

AS

Code Change No: E13-07/08

Original Proposal

Sections: 1003.5 (IFC [B] 1003.5)

Proponent: John Williams, Washington State Department of Health, Construction Review Services, representing Washington Association of Building Officials Technical Code Development Committee

Revise as follows:

1003.5 (IFC [B] 1003.5) Elevation change. Where changes in elevation of less than 12 inches (305 mm) exist in the means of egress, sloped surfaces shall be used. Where the slope is greater than one unit vertical in 20 units horizontal (5-percent slope), ramps complying with Section 1010 shall be used. Where the difference in elevation is 6 inches (152 mm) or less, the ramp shall be equipped with either handrails or floor finish materials that contrast with adjacent floor finish materials.

Exceptions:

1. A single step with a maximum riser height of 7 inches (178 mm) is permitted for buildings with occupancies in Groups F, H, R-2, R-3, S and U at exterior doors not required to be accessible by Chapter 11.
2. A stair with a single riser or with two risers and a tread is permitted at locations not required to be accessible by Chapter 11, provided that the risers and treads comply with Section 1009.3, the minimum depth of the tread is 13 inches (330 mm) and at least one handrail complying with Section 1012 is provided within 30 inches (762 mm) of the centerline of the normal path of egress travel on the stair.
3. A step is permitted in aisles serving seating that has a difference in elevation less than 12 inches (305 mm) at locations not required to be accessible by Chapter 11, provided that the risers and treads comply with Section 1025.11 and the aisle is provided with a handrail complying with Section 1025.13.

Any change in elevation in a corridor serving nonambulatory persons in a Group I-2 occupancy Throughout a story in a Group I-2 occupancy, any change in elevation in portions of the exit access that serve nonambulatory persons shall be by means of a ramp or sloped walkway.

Reason: The purpose of this code change is to clarify the intent of the current code. The purpose of this section is to prevent a condition where a patient on a hospital bed or stretcher would be required to maneuver a stair or step. Quick horizontal movement of stretchers and beds is imperative during the routine operation of a healthcare facility. I-2 occupancies also use a "protect in place" concept which relies on horizontal evacuation of patient on beds and stretchers during a fire event.

Most hospitals take advantage of the suite provisions within IBC 1014.2.2, which creates passageways that are not classified as a corridor. These passageways often serve nonambulatory traffic, but the current code would not apply to them. A broader term such as “exit access” is necessary to capture all of the areas that see nonambulatory traffic. The existing qualifier “serving nonambulatory persons” remains to prevent this from being applied to mechanical spaces and other staff only areas. The term “story” is used to clarify that this section applies to movement along a level plane; not movement between stories.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The proposal will prevent a condition where a non-ambulatory person would have to negotiate a condition other than a ramp.

Assembly Action:

None

Final Hearing Results

E13-07/08

AS

Code Change No: E14-07/08

Original Proposal

Sections: 1003.7 (IFC [B] 1003.7), 3008 (New); IFC 903.3.1.1.1 (IBC [F] 903.3.1.1.1)

Proponent: David W Frable, US General Services Administration, Gerald H Jones, representing himself

THESE PROPOSALS ARE ON THE AGENDA OF THE IBC MEANS OF EGRESS AND THE IFC CODE DEVELOPMENT COMMITTEES AS 2 SEPARATE CODE CHANGES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IBC MEANS OF EGRESS

1. Revise as follows:

1003.7 (IFC [B] 1003.7) Elevators, escalators and moving walks. Elevators, escalators and moving walks shall not be used as a component of a required means of egress from any other part of the building.

Exceptions:

1. Elevators used as an accessible means of egress in accordance with Section 1007.4.
2. Elevators when designed in accordance with Section 3008 for use as general egress as approved by the building official.

2. Add new text as follows:

SECTION 3008
OCCUPANT EVACUATION ELEVATORS.

3008.1 General. Elevators arranged in accordance with this section shall be permitted to be used for occupant egress in fires and other emergencies.

3008.2 Operation. The occupant evacuation elevators shall be used for occupant-controlled evacuation only in the normal elevator operating mode prior to Phase I Emergency Recall Operation in accordance with the requirements in ASME A17.1.

3008.12.3.2 Door closing. Each fire door assembly protecting the lobby doorway shall be automatic closing upon receipt of any fire alarm signal from the emergency voice/alarm communication system serving the building.

3008.12.4 Lobby size. Each occupant evacuation elevator lobby shall have minimum floor area as follows:

1. The occupant evacuation elevator lobby floor area shall accommodate, at 3 ft² (0.28 m²) per person, a minimum of 25 percent of the occupant load of the floor area served by the lobby.
2. The occupant evacuation elevator lobby floor area also shall accommodate one wheelchair space of 30 in. by 48 in. (760 mm by 1220 mm) for each 50 persons, or portion thereof, of the occupant load of the floor area served by the lobby.

3008.12.5 Lobby status indicator. Each occupant evacuation elevator lobby shall be equipped with a status indicator arranged to display the following information:

1. A green light and the message, "Elevators available for occupant evacuation".
2. A yellow light and the message, "Elevators operating under fire department control to assist occupants with disabilities".
3. A red light and the message, "Elevators out of service, use exit stairs".

3008.13 Two-way communication system. Each occupant evacuation elevator car and elevator lobby shall be provided with a two-way communication system for communication between each elevator car and landing and the fire command center or a central control point location approved by the fire department. The two-way communication system shall include both audible and visible signals.

3008.13.1 Directions. Directions for the use of the two-way communication system, instructions for summoning assistance via the two-way communication system, and written identification of the location, shall be posted adjacent to the two-way communication system.

3008.14 Standpipe hose connection. A Class I standpipe hose connection in accordance with Section 905 shall be provided in the exit enclosure having direct access from the occupant evacuation elevators lobby.

3008.15 Elevator system monitoring. The occupant evacuation elevators shall be continuously monitored at the fire command center or a central control point approved by the fire department by a standard emergency service interface system meeting the requirements of NFPA 72 and arranged to display the following information:

1. Floor location of each elevator car
2. Direction of travel of each elevator car
3. Status of each elevator car with respect to whether it is occupied
4. Status of normal power to the elevator equipment, elevator controller cooling equipment, and elevator machine room ventilation and cooling equipment
5. Status of standby power to the elevator equipment, elevator controller cooling equipment, and elevator machine room ventilation and cooling equipment
6. Activation of any fire alarm initiating device in any elevator hoistway (if provided), elevator lobby, or elevator machine room
7. Occurrence of an impending over temperature condition (IOT) condition within the elevator controllers

3008.15.1 Elevator system over-ride. The fire command center or a central control point approved by the fire department shall be provided with the means to override normal elevator operation and to initiate manually a Phase I Emergency Recall of the occupant evacuation elevators in accordance with ASME A17.1.

3008.16 Electrical power. The following features serving each occupant evacuation elevators shall be supplied by both normal power and Type 60/Class 2/Level 1 standby power:

1. Elevator equipment.
2. Elevator machine room ventilation and cooling equipment.
3. Elevator controller cooling equipment.

3008.16.1 Protection of wiring or cables. Wires or cables that provide normal and standby power, control signals, communication with the car, lighting, heating, air conditioning, ventilation and fire-detecting systems to fire service access elevators shall be protected by construction having a minimum 1-hour fire-resistance rating or shall be circuit integrity cable having a minimum 1-hour fire-resistance rating.

PART II – IFC

Revise as follows:

903.3.1.1.1 (IBC [F] 903.3.1.1.1) Exempt locations. Automatic sprinklers shall not be required in the following rooms or areas where such rooms or areas are protected with an approved automatic fire detection system in accordance with Section 907.2 that will respond to visible or invisible particles of combustion. Sprinklers shall not be omitted from any room merely because it is damp, of fire-resistance rated construction or contains electrical equipment.

1. Any room where the application of water, or flame and water, constitutes a serious life or fire hazard.
2. Any room or space where sprinklers are considered undesirable because of the nature of the contents, when approved by the fire code official.
3. Generator and transformer rooms separated from the remainder of the building by walls and floor/ceiling or roof/ceiling assemblies having a fire-resistance rating of not less than 2 hours.
4. Rooms or areas that are of noncombustible construction with wholly noncombustible contents.
5. Fire service access elevators machine rooms and machinery spaces.
6. Machine rooms and machinery spaces for occupant evacuation elevators designed in accordance with Section 3008.

Reason: The use of elevators for occupant egress is a significant change that will have many impacts in regulation and in building design. This proposal is intended to introduce requirements for the arrangement and design of protected elevators for occupant egress into the code without mandating them anywhere. The result would be that they can be used where approved and justified through an engineering analysis. This is no different than acceptance through a variance or performance approach as currently permitted under the code. The difference is that the requirements included in this section provide guidance on safe implementation. The inclusion of this information in the code will permit code officials and designers to develop a comfort level with the technology and to facilitate improvements to the requirements in the Code and referenced technical standards.

The current concept is being addressed by the ASME A17 Task Group on Use of Elevator for Occupant Egress the Occupant evacuation elevators that will incorporate a special evacuation protocol that will be specified in ASME A17.1. While not currently finalized, it is likely to involve the immediate evacuation of the fire floor and two floors above and below the fire floor, then awaiting a decision by the Incident Commander of whether to initiate a full building evacuation. The protocol would be terminated by the activation of Phase I recall as currently required. This protocol requires that the system recognize the floor of origin to begin the process. This would probably be initiated by the (required) sprinkler system if it is arranged to indicate sprinkler flow by floor.

For the record, GSA is committed to this endeavor and been funding research at the National Institute of Standards & Technology (NIST) for the past several years for the development of performance requirements for the use of elevators for occupant egress during a fire emergency prior to Phase I Emergency Recall. GSA has also been participating in the ASME A17 Task Groups on Use of Elevators by Firefighters and Use of Elevator for Occupant Egress regarding this subject matter.

Item # 1

1. RE: 1003.7 - This paragraph provides new code requirement that permits the use of elevators for general egress if approved by the building official.

Item # 2

(Major Issues)

1. RE: 3008 – This paragraph provides new Section of requirements that permits the use of elevators for general egress if approved by the building official.
2. RE: 3008.2 – This paragraph permits occupants to use elevators during a fire emergency prior to Phase I Emergency Recall Operation.
3. RE: 3008.3 – This paragraph permits the building official to reduce capacity of exit stairs. Experience in Asia (Taipei 101 and Petronas Towers) with egress systems that combine elevators and exit stairs has demonstrated in drills that occupant evacuation elevators can provide a safe means of egress in emergencies including fires for all occupants (including those with disabilities) and represent the only means of timely egress for occupants of very tall buildings. Where elevators are the primary means of egress in emergencies it is reasonable that the exit stair capacity can be reduced, while maintaining at least two exit stairs of adequate width and remoteness. It should be permitted to reduce stair capacity as long as the total egress time is shown by a proper egress analysis not to increase over that provided by the exit stairs alone.
4. RE: 3008.12.2 - This paragraph addresses the enclosure requirements for the lobby. A smoke barrier is the appropriate reference since it is designed to resist fire and smoke spread and is intended to create an area of refuge. The new exception addresses the need for not requiring an enclosed lobby on the street floor.
5. RE: 3008.12.2.1 – This paragraph addresses a minimum impact resistance rating for the construction materials of the lobby enclosure.
6. RE: 3008.12.4 - This paragraph addresses a minimum floor area for a lobby based on occupant load factors. Information based on current elevator lobby capacity requirements for towers in the National Fire Protection Association, Life Safety Code.
7. RE: 3008.12.5 – This paragraph addresses information that will be displayed within the occupant evacuation elevator lobby
8. RE: 3008.13 – This paragraph addresses the two-way communication system to be provided between each elevator car and landing and the fire command center or a central control point location.
9. RE: 3008.14 – This paragraph addresses requirements for a standpipe hose connection in non-required or additional exit stairways.
10. RE: 3008.15 – This paragraph addresses the minimum information to be displayed within the fire command center or a central control point location for monitoring the occupant evacuation elevators.
11. RE: 3008.15.1 - This paragraph addresses requirements for the fire command center or a central control point approved by the fire department be provided with the means to override normal elevator operation and to initiate manually a Phase I Emergency Recall of the occupant evacuation elevators in accordance with ASME A17.1.

Item # 3

1. RE 903.3.1.1.1 - This new exception permits automatic sprinkler protection to be exempt in occupant evacuation machine rooms and machinery spaces.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing Results

PART I – IBC MEANS OF EGRESS**Committee Action:****Disapproved**

Committee Reason: Occupant evacuation elevators are a good idea that needs to be moved forward very soon; however, further development is needed for this proposal. The reduction in exit capacity is a grave concern if the elevators have lost power or have gone into Phase I recall. The committee sponsored by ASME A17.1 has not completed their hazard analysis – this information needs to be incorporated. The method to keep water out of the elevator system must be detailed. The number of elevators and travel distance must be included in the requirements. Exit enclosures may need further investigation. Section 3008.12.2 for lobby enclosure requires a smoke barrier which is in conflict with Section 707.14.1 which requires a fire partition. Having this as a voluntary system is a good idea.

Assembly Action:**None****PART II – IFC****Committee Action:****Disapproved**

Committee Reason: For consistency with the action taken by the IBC-MOE Committee on Part I of this proposal. The proposed IFC reference to IBC Section 3008 is moot without approval of Part I.

Assembly Action:**None**

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because public comments were submitted for Part I.

Public Comment 2:

Dave Frable, U.S. General Services Administration, requests Approval as Modified by this public comment.

Modify proposal as follows:

1003.7 (IFC [B] 1003.7) Elevators, escalators and moving walks. Elevators, escalators and moving walks shall not be used as a component of a required means of egress from any other part of the building.

Exceptions:

- 4- Elevators used as an accessible means of egress in accordance with Section 1007.4.
- ~~2- Elevators when designed in accordance with Section 3008 for use as general egress as approved by the building official.~~

403.19 Occupant evacuation elevators. Where installed in accordance with Section 3008, passenger elevators for general public use shall be permitted to be used for occupant self evacuation.

**SECTION 3008
OCCUPANT EVACUATION ELEVATORS.**

~~3008.1 General.~~ Elevators arranged in accordance with this section shall be permitted to be used for occupant egress in fires and other emergencies. Where elevators are to be used for occupant self evacuation during fires, all passenger elevators for general public use shall comply with this Section. Where other elevators are used for occupant self evacuation, they shall also comply with this Section.

~~3008.5~~ **3008.2 Fire safety and evacuation plan.** The building shall have an approved fire safety and evacuation plan in accordance with the applicable requirements of Section 404 of the International Fire Code. The subject fire safety and evacuation plan shall incorporate specific procedures for the occupants using evacuation elevators and exit stairs

~~3008.3~~ **3008.3 New egress capacity.** The total required capacity of the exit stairs on each floor can be reduced by not more than 50% where occupant evacuation elevators are provided. The amount of reduction of the required capacity of the exit stairs shall be determined by an approved egress analysis that demonstrates that the total egress time for occupants using the combination of evacuation elevators and exit stairs is not more than the total egress time for occupants only using the required exit stairs.

~~3008.2~~ **3008.3 Operation.** The occupant evacuation elevators shall be used for occupant-controlled self evacuation only in the normal elevator operating mode prior to Phase I Emergency Recall Operation in accordance with the requirements in ASME A17.1/CSA B44 and the building's fire safety and evacuation plan.

~~3008.4~~ **3008.4 Number of Occupant Evacuation Elevators.** Each accessible floor that is one or more stories above or below the level of exit discharge shall be provided with a minimum of one bank or group of occupant evacuation elevators. All elevators within that bank or group of elevators, other than the fire service access elevators installed in accordance with Section 3007, shall be occupant evacuation elevators.

~~3008.6~~ **3008.4 Emergency voice/alarm communication system.** The building shall be provided with an emergency voice/alarm communication system. The emergency voice/alarm communication system shall be accessible to the fire department. The system shall be provided in accordance with Section 907.2.12.2.

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~~3008.6.4~~ **3008.4.1 Notification appliances.** A minimum of one audible and one visible notification appliance shall be installed within each occupant evacuation elevator lobby.

~~3008.7~~ **3008.5 Automatic sprinkler system.** The building shall be protected throughout by an approved, electrically-supervised automatic sprinkler system in accordance with Section 903.3.1.1.1, except as otherwise permitted by Section 903.3.1.1.1 and as prohibited by 3008.5.1.

3008.5.1 Prohibited locations. Automatic sprinklers shall not be installed in elevator machine rooms and elevator machine spaces for occupant evacuation elevators.

~~3008.7.1~~ **3008.5.2 Sprinkler system monitoring.** The sprinkler system shall have a sprinkler control valve supervisory switch and water flow initiating device provided for each floor that is monitored by the building's ~~emergency voice/alarm communication~~ fire alarm system.

~~3008.8~~ **3008.6 High hazard content areas.** No building areas shall contain high hazard contents exceeding the maximum allowable quantities per control area as addressed in Section 414.2.

~~3008.9~~ **3008.7 Shunt trip breakers.** Shunt breakers Means for elevator shut down in accordance with Section 3006.5 shall not be installed on elevator systems used for occupant evacuation elevators.

~~3008.10~~ **3008.8 Hoistway enclosure protection.** The occupant evacuation elevators shall be located in a ~~shaft~~ hoistway enclosure(s) complying with Section 707.

~~3008.11~~ **3008.9 Water protection.** The occupant evacuation elevator hoistway ~~and associated elevator landings~~ shall be designed by utilizing an approved method to prevent water from the operation of the automatic sprinkler system from infiltrating into the shaft hoistway enclosure from the operation of the automatic sprinkler system or firefighting activities.

~~3008.12~~ **3008.10 Occupant evacuation elevator lobby.** The occupant evacuation elevators shall open into an elevator lobby in accordance with Sections ~~3008.12.10.1 through 3008.12.5.10.4.~~

~~3008.12.1~~ **3008.10.1 Access.** The occupant evacuation elevator lobby shall have direct access to an exit enclosure.

~~3008.12.2~~ **3008.10.2 Lobby enclosure.** The occupant evacuation elevator lobby shall be enclosed with a smoke barrier having a minimum 1-hour fire-resistance rating, except that lobby doorways shall comply with Section ~~3008.12.10.3.~~

Exception: Enclosed occupant evacuation elevator lobbies are not required at the ~~street floor~~ level(s) of exit discharge.

~~3008.12.2.1~~ **Lobby construction materials.** The construction materials of the lobby enclosure shall have a minimum classification level 2 rating in accordance with the requirements of ASTM C1629/C1629M.

~~3008.12.3~~ **3008.10.3 Lobby doorways.** Each occupant evacuation elevator lobby shall be provided with a doorway that is protected with a 3/4-hour fire door assembly complying with Section 715.4.

~~3008.12.3.1~~ **3008.10.3.1 Vision panel.** A vision panel shall be installed in each fire door assembly protecting the lobby doorway. The vision panel shall consist of fire protection-rated glazing and located to furnish clear vision of the occupant evacuation elevator lobby.

~~3008.12.3.2~~ **3008.10.3.2 Door closing.** Each fire door assembly protecting the lobby doorway shall be automatic closing upon receipt of any fire alarm signal from the emergency voice/alarm communication system serving the building.

~~3008.12.4~~ **3008.10.4 Lobby size.** Each occupant evacuation elevator lobby shall have minimum floor area as follows:

1. The occupant evacuation elevator lobby floor area shall accommodate, at 3 ft² (0.28 m²) per person, a minimum of 25 percent of the occupant load of the floor area served by the lobby.
2. The occupant evacuation elevator lobby floor area also shall accommodate one wheelchair space of 30 inch by 48 inch (760 mm by 1220 mm) for each 50 persons, or portion thereof, of the occupant load of the floor area served by the lobby.

Exception: The size of lobbies serving multiple banks of elevators shall have the minimum floor area approved on an individual basis and shall be consistent with the building's fire safety and evacuation plan.

~~3008.10.5~~ **Signage.** An approved sign indicating elevators are suitable for occupant self evacuation shall be posted on all floors adjacent to each elevator call station serving occupant evacuation elevators.

~~3008.12.5~~ **3008.11 Lobby status indicator.** Each occupant evacuation elevator lobby shall be equipped with a status indicator arranged to display the following information:

1. An illuminated green light and the message, "Elevators available for occupant evacuation" when the elevators are operating in normal service and the fire alarm system is indicating an alarm in the building.
- ~~2. A yellow light and the message, "Elevators operating under fire department control to assist occupants with disabilities".~~
- ~~2.3.~~ An illuminated red light and the message, "Elevators out of service, use exit stairs" when the elevators are in Phase I emergency recall operation in accordance with the requirements in ASME A17.1/CSA B44.
3. No illuminated light or message when the elevators are operating in normal service.

~~3008.13~~ **3008.12 Two-way communication system.** A two-way communication system shall be provided in each occupant evacuation elevator lobby for the purpose of initiating communication with the fire command center or an alternate location approved by the fire department. Each occupant evacuation elevator car and elevator lobby shall be provided with a two-way communication system for communication between each elevator car and landing and the fire command center or a central control point location approved by the fire department. The two-way communication system shall include both audible and visible signals.

3008.12.1 Design and Installation. The two-way communication system shall include audible and visible signals and shall be designed and installed in accordance with the requirements in ICC A117.1.

3008.12.2 Instructions. Instructions for the use of the two-way communication system along with the location of the station shall be permanently located adjacent to each station. Signage shall comply with the ICC A117.1 requirements for visual characters.

~~**3008.13.1 Directions.** Directions for the use of the two-way communication system, instructions for summoning assistance via the two-way communication system, and written identification of the location, shall be posted adjacent to the two-way communication system.~~

~~**3008.14 Standpipe hose connection.** A Class I standpipe hose connection in accordance with Section 905 shall be provided in the exit enclosure having direct access from the occupant evacuation elevators lobby.~~

3008.15 3008.13 Elevator system monitoring. The occupant evacuation elevators shall be continuously monitored at the fire command center or a central control point approved by the fire department by a standard emergency service interface system meeting the requirements of NFPA 72 and arranged to display the following information:

1. Floor location of each elevator car.
2. Direction of travel of each elevator car.
3. Status of each elevator car with respect to whether it is occupied.
4. Status of normal power to the elevator equipment, elevator controller cooling equipment, and elevator machine room ventilation and cooling equipment.
5. Status of standby or emergency power system that provides backup power to the elevator equipment, elevator controller cooling equipment, and elevator machine room ventilation and cooling equipment.
6. Activation of any fire alarm initiating device in any elevator hoistway (if provided), elevator lobby, or elevator machine room or machine space, or elevator hoistway.
7. Occurrence of an impending over temperature condition (IOT) condition within the elevator controllers.

~~**3008.15.4 3008.13.1 Elevator recall system over-ride.** The fire command center or a central control point at an alternate location approved by the fire department shall be provided with the means to override normal elevator operation and to initiate manually initiate a Phase I Emergency Recall of the occupant evacuation elevators in accordance with ASME A17.1/CSA B44.~~

3008.16 3008.14 Electrical power. The following features serving each occupant evacuation elevators shall be supplied by both normal power and Type 60/Class 2/Level 1 standby power:

1. Elevator equipment.
2. Elevator machine room ventilation and cooling equipment.
3. Elevator controller cooling equipment.

~~**3008.16.4 3008.14.1 Protection of wiring or cables.** Wires or cables that provide normal and standby power, control signals, communication with the car, lighting, heating, air conditioning, ventilation and fire-detecting systems to fire service access elevators shall be protected by construction having a minimum 1-hour fire-resistance rating or shall be circuit integrity cable having a minimum 1-hour fire-resistance rating.~~

3002.3 Emergency signs. An approved pictorial sign of a standardized design shall be posted adjacent to each elevator call station on all floors instructing occupants to use the exit stairways and not to use the elevators in case of fire. The sign shall read: IN FIRE EMERGENCY, DO NOT USE ELEVATOR. USE EXIT STAIRS. ~~The emergency sign shall not be required for elevators that are part of an accessible means of egress complying with Section 1007.4.~~

Exceptions.

1. The emergency sign shall not be required for elevators that are part of an accessible means of egress complying with Section 1007.4.
2. The emergency sign shall not be required for elevators that are used for occupant self evacuation in accordance with Section 3008.

Commenter's Reason: As the proponent of the original code change proposal, I submit this comment to request the membership support the subject revised code change. The proposed code change is a by-product of research currently being conducted by the National Institute of Standards and Technology (NIST) and funded by the U.S. General Services Administration. Overall, the Means of Egress Code Committee stated they were in favor of the code change proposal but disapproved the code change proposal based on a number of issues. The purpose of this modified code change is to address the major issues raised by the Means of Egress Code Committee and participants at the hearing in Palm Springs, CA.

1. **1003.7 Elevators, escalators and moving walks.** The existing paragraph was not revised. The use of elevators for general egress from the building is not being considered at this time.
2. **403.19 Occupant evacuation elevators.** This new paragraph was added to clarify which elevators are permitted to be used for occupant-self evacuation. It also addresses the Means of Egress Code Committee's request that occupant evacuation elevators are a voluntary option for architects to consider when designing tall buildings. The new material creates a trigger that can allow voluntary installation of occupant evacuation elevators and points the reader to the appropriate section for the requirements.
3. **3008.1 General.** This paragraph was revised for clarification purposes. Revisions clarify that all the passenger elevators for general public use complying with section 3008 are to be used for occupant-self evacuation during fires. In order for successful implementation of occupant evacuation elevators, all passenger elevators for general public use must be available for use during this time frame.
4. **3008.2 Fire safety and evacuation plan.** This paragraph was revised for clarification purposes.
5. **New egress capacity.** This paragraph was deleted based on concerns raised by the Means of Egress Code Committee. The concept of reduction in egress capacity has not had sufficient technical review at this time.
6. **3008.3 Operation.** This paragraph was revised for clarification purposes.
7. **Number of Occupant Evacuation Elevators.** This paragraph was deleted based on the revised text in Section 3008.1 General.
8. **3008.5 Automatic Sprinkler System.** This paragraph was revised to reference 3008.5.1.
9. **3008.5.1 Prohibited locations.** This paragraph was revised for clarification purposes and to be with consistent with proposed requirements in 903.3.1.1.1, Item 6 in IFC. Revision emphasizes that sprinklers shall not be installed in elevator machine rooms and elevator machine spaces for occupant evacuation elevators.
10. **3008.5.2 Sprinkler system monitoring.** This paragraph was revised for clarification purposes.
11. **3008.7 Shunt trip.** Revised to use correct terminology.
12. **3008.8 Hoistway Enclosure Protection.** Revised to use correct terminology.

13. **3008.9 Water protection.** This paragraph was revised for clarification purposes. The revisions addresses the concerns of several members of the Committee as well as others that performance based language is preferred over prescriptive language to permit alternative design options. Recommended design options best suited to be provided in commentary. Also, this section was revised to use correct terminology.
14. **3008.10 Occupant evacuation elevator lobby.** This paragraph was revised for clarification purposes.
15. **3008.10.2 Lobby enclosure.** No revisions were made to this section since there is no conflict regarding the lobby enclosure for occupant evacuation elevators and the elevator lobby requirements in Section 707.14.1 for non-occupant evacuation elevators. A smoke barrier is the appropriate reference since it is designed to resist fire and smoke spread and is intended to create an area for occupants to stage prior to using the elevators for evacuation.
 - a. **Exception.** The exception was revised for clarification purposes. The term “street floor” is used in the Code is not a defined term in the Code. The term “level of exit discharge” is defined in the Code and seems the more appropriate term to use.
16. **Lobby construction materials.** This paragraph was deleted based on concerns from individuals that the level 2 rating requirements in ASTM C1629/C1629M only applies to gypsum type materials and not concrete.
17. **3008.10.4 Lobby size.** This paragraph was revised for clarification purposes. The new exception provides performance based language for determining the size of occupant evacuation lobbies serving multiple banks of elevators on the same or from multiple floors.
18. **3008.10.5 Signage.** This new paragraph was added to ensure proper signage is posted on all floors informing occupants that the elevators are suitable for occupant-self evacuation.
19. **3008.10.6 Lobby status indicator.** This paragraph was revised for clarification purposes. Item 2 was deleted based on concerns that the fire department may use these elevators for other purposes then only to assist occupants with disabilities.
20. **3008.12 Two-way communication.** This paragraph was revised for clarification purposes.
21. **3008.12.1 Design and installation.** This new paragraph was added for clarification purposes.
22. **3008.12.2 Instruction.** This new paragraph was added for clarification purposes.
23. **Directions.** This paragraph was deleted based on need paragraphs 3008.12.1 and 3008.12.2 being added.
24. **Standpipe hose connection.** This paragraph was deleted because it was determined that the need for a standpipe hose connection in the exit stair serving the occupant evacuation elevator lobby is not a critical element in the protection scheme for the occupants using the elevators for evacuation. In addition, installation of the standpipe hose connection will not increase the overall safety of occupants using the elevators for evacuation in the subject elevator lobby. Such standpipes serve a greater purpose for fire fighters and are already addressed in the provisions for Fire Service Access Elevators.
25. **3008.13 Elevator system monitoring.** This paragraph was revised for clarification purposes.
26. **3008.13.1 Elevator recall.** This paragraph was revised for clarification purposes and has been revised to use the correct terminology.
27. **3002.3 Emergency signs.** This paragraph was revised for clarification purposes. Ensures the standard emergency sign is not installed on elevator landings for elevators that are used for occupant-self evacuation in Section 3008.

Public Comment 3:

Paul K. Heilstedt, PE, FAIA, Chair, representing ICC Code Technology Committee (CTC) requests Approval as Modified by this public comment.

Modify proposal as follows:

3008.4 Additional means of egress. Where an additional means of egress is required in accordance with Section 403.17, an additional exit stair shall not be required to be installed in buildings having elevators used for occupant controlled evacuation in accordance with this section.

403.17 (Supp) Additional means of egress. For buildings other than Group R-2 that are more than 420 feet in height, one additional means of egress meeting the requirements of Sections 1009 and 1020 shall be provided in addition to the minimum number of exits required by Section 1019.1. The total width of any combination of remaining stairways with one stairway removed shall not be less than the total width required by Section 1005.1. Scissor stairs shall not be considered the additional exit stair required by this section.

Exception. An additional exit stairway shall not be required to be installed in buildings having elevators used for occupant-controlled evacuation in accordance with Section 3008.

(Portions of proposal not shown remain unchanged)

Commenter-s Reason: The proposed new Section 3008.4 and coordinated text in Section 403.17 is intended to provide a reasonable alternative to the additional stair requirement for high rise buildings. If the Code is to mandate one additional exit stairway in buildings greater than 420 feet in height, we strongly feel that alternate solutions to increasing evacuation capability in tall buildings should be provided. The proposed text recognizes occupant evacuation elevators as a reasonable alternative to providing an additional exit stair and will improve overall building safety by decreasing the overall occupant evacuation times in tall buildings.

Code issues are assigned to the CTC by the ICC Board as “areas of study”. Information on the CTC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CTC effort can be downloaded from the following website: <http://www.iccsafe.org/cs/cc/ctc/index.html>. Since its inception in April/2005, the CTC has held fifteen meetings - all open to the public. This public comment is a result of the CTC’s investigation of the area of study entitled “NIST World Trade Center Recommendations”. The CTC web page for this area of study is: <http://www.iccsafe.org/cs/cc/ctc/WTC.html>

Final Hearing Results

**E14-07/08, Part I AMPC2, 3
E14-07/08, Part II D**

Code Change No: E19-07/08

Original Proposal

Table 1005.1 (IFC [B]1005.1), 3403.5(New), 3410.6.11, Table 3410.6.11(1) (New), Table 3410.6.11, [IEBC [B]302.5(New), [B]1306.11.1(New), [B]Table 1306.11.1(1) (New), Table 1306.11.1]; IFC 1027.2(New), Table 1027.2(New); IEBC 604.2(New), Table 604.2(New), 912.4.1, 912.4.2

Proponent: David Frable, US General Services Administration

THESE PROPOSALS ARE ON THE AGENDA OF THE IBC MEANS OF EGRESS, IFC AND THE IEBC CODE DEVELOPMENT COMMITTEES AS 3 SEPARATE CODE CHANGES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IBC MEANS OF EGRESS

1. Delete and substitute as follows:

**TABLE 1005.1 (IFC [B] 1005.1) (Supp)
EGRESS WIDTH PER OCCUPANT SERVED**

OCCUPANCY	WITHOUT SPRINKLER SYSTEM		WITH SPRINKLER SYSTEM ^a	
	Stairways (inches per occupant)	Other egress components (inches per occupant)	Stairways (inches per occupant)	Other egress components (inches per occupant)
Occupancies other than those listed below	0.3	0.2	0.2	0.15
Hazardous: H-1, H-2, H-3 and H-4	Not permitted	Not permitted	0.3	0.2
Institutional: I-2	Not permitted	Not permitted	0.3	0.2

For SI: 1 inch = 25.4 mm.

a. Buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2.

**TABLE 1005.1 (IFC [B] TABLE 1005.1)
EGRESS WIDTH PER OCCUPANT SERVED**

OCCUPANCY	STAIRWAYS (INCHES PER OCCUPANT)	OTHER EGRESS COMPONENTS (INCHES PER OCCUPANT)
All occupancies	0.3	0.2

For SI: 1 inch = 25.4 mm.

3403.5 (IEBC 302.5) Means of egress capacity factors. Alterations to any existing building or structure shall not be affected by the egress width factors in Table 1005.1 for new construction in determining the minimum egress widths or the minimum number of exits in an existing building or structure. The minimum egress widths for the components of the means of egress shall be based on the means of egress width factors in the building code under which the building was constructed, and shall be considered as complying means of egress for any alteration if, in the opinion of the building official, they do not constitute a distinct hazard to life.

2. Revise as follows:

3410.6.11 (IEBC [B] 1301.6.11) Means-of-egress capacity and number. Evaluate the means-of-egress capacity and the number of exits available to the building occupants. In applying this section, the means of egress are required to conform to the following sections of the *International Building Code*: 1003.7, 1004, 1005.1, 1014.2, 1014.3, 1015.2, 1019, 1024.1, 1024.2, 1024.6, 1025.2, 1024.3, 1024.4 and 1026 (except that the minimum width required by this section shall be determined solely by the width for the required capacity in accordance with Table

3410.6.11(1). The number of exits credited is the number that is available to each occupant of the area being evaluated. Existing fire escapes shall be accepted as a component in the means of egress when conforming to Section 705.3.1.2. Under the categories and occupancies in Table 1301.6.11(2), determine the appropriate value and enter that value into Table 1301.7 under Safety Parameter 1301.6.11, Means-of-Egress Capacity, for means of egress and general safety.

**TABLE 3410.6.11(1) [IEBC TABLE 1306.11.1(1)]
EGRESS WIDTH PER OCCUPANT SERVED**

<u>OCCUPANCY</u>	<u>WITHOUT SPRINKLER SYSTEM</u>		<u>WITH SPRINKLER SYSTEM^a</u>	
	<u>Stairways (inches per occupant)</u>	<u>Other egress components (inches per occupant)</u>	<u>Stairways (inches per occupant)</u>	<u>Other egress components (inches per occupant)</u>
Occupancies other than those listed below	<u>0.3</u>	<u>0.2</u>	<u>0.2</u>	<u>0.15</u>
Hazardous: H-1, H-2, H-3 and H-4	Not permitted	Not permitted	<u>0.3</u>	<u>0.2</u>
Institutional: I-2	Not permitted	Not permitted	<u>0.3</u>	<u>0.2</u>

For SI: 1 inch – 25.4 mm.

- a. Buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2.

**TABLE 3410.6.11(2) [IEBC TABLE 1306.11.1(2)]
MEANS OF EGRESS VALUES**

(No change to table – change reference to table in)

PART II – IFC

Add new text as follows:

1027.2 Minimum required egress width. The means of egress width shall not be less than required by this section. The total width of means of egress in inches (mm) shall not be less than the total occupant load served by the means of egress multiplied by the factors in Table 1027.2 and not less than specified elsewhere in this section. Multiple means of egress shall be sized such that the loss of any one means of egress shall not reduce the available capacity to less than 50 percent of the required capacity. The maximum capacity required from any story of a building shall be maintained to the termination of the means of egress.

**TABLE 1027.2
EGRESS WIDTH PER OCCUPANT SERVED**

<u>OCCUPANCY</u>	<u>WITHOUT SPRINKLER SYSTEM</u>		<u>WITH SPRINKLER SYSTEM^a</u>	
	<u>Stairways (inches per occupant)</u>	<u>Other egress components (inches per occupant)</u>	<u>Stairways (inches per occupant)</u>	<u>Other egress components (inches per occupant)</u>
Occupancies other than those listed below	<u>0.3</u>	<u>0.2</u>	<u>0.2</u>	<u>0.15</u>
Hazardous: H-1, H-2, H-3 and H-4	Not permitted	Not permitted	<u>0.3</u>	<u>0.2</u>
Institutional: I-2	Not permitted	Not permitted	<u>0.3</u>	<u>0.2</u>

For SI: 1 inch – 25.4 mm.

- a. Buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2.

PART III – IEBC

1. Add new text as follows:

604.2 Minimum required egress width. The means of egress width shall not be less than required by this section. The total width of means of egress in inches (mm) shall not be less than the total occupant load served by the means of egress multiplied by the factors in Table 604.2 and not less than specified elsewhere in this section. Multiple means of egress shall be sized such that the loss of any one means of egress shall not reduce the available capacity to less than 50 percent of the required capacity. The maximum capacity required from any story of a building shall be maintained to the termination of the means of egress.

**TABLE 604.2
EGRESS WIDTH PER OCCUPANT SERVED**

OCCUPANCY	WITHOUT SPRINKLER SYSTEM		WITH SPRINKLER SYSTEM^a	
	Stairways (inches per occupant)	Other egress components (inches per occupant)	Stairways (inches per occupant)	Other egress components (inches per occupant)
Occupancies other than those listed below	0.3	0.2	0.2	0.15
Hazardous: H-1, H-2, H-3 and H-4	Not permitted	Not permitted	0.3	0.2
Institutional: I-2	Not permitted	Not permitted	0.3	0.2

For SI: 1 inch – 25.4 mm.

- a. Buildings equipped throughout with an automatic sprinkler system in accordance with the *International Building Code* Section 903.3.1.1 or 903.3.1.2.

2. Revise as follows:

912.4.1 (Supp) Means of egress for change to higher hazard category. When a change of occupancy classification is made to a higher hazard category (lower number) as shown in Table 912.4, the means of egress shall comply with the requirements of Chapter 10 of the *International Building Code*.

Exceptions:

1. Stairways shall be enclosed in compliance with the applicable provisions of Section 803.1.
2. Existing stairways including handrails and guards complying with the requirements of Chapter 8 shall be permitted for continued use subject to approval of the code official.
3. Any stairway replacing an existing stairway within a space where the pitch or slope cannot be reduced because of existing construction shall not be required to comply with the maximum riser height and minimum tread depth requirements.
4. Existing corridor walls constructed of wood lath and plaster in good condition or 1/2-inch-thick (12.7 mm) gypsum wallboard shall be permitted.
5. Existing corridor doorways, transoms, and other corridor openings shall comply with the requirements in Sections 705.5.1, 705.5.2, and 705.5.3.
6. Existing dead-end corridors shall comply with the requirements in Section 705.6.
7. An existing operable window with clear opening area no less than 4 square feet (0.38 m²) and with minimum opening height and width of 22 inches (559 mm) and 20 inches (508 mm), respectively, shall be accepted as an emergency escape and rescue opening.
8. Existing corridors shall be permitted to comply with the egress width capacity as determined by Table 604.2.

912.4.2 Means of egress for change of use to equal or lower hazard category. When a change of occupancy classification is made to an equal or lesser hazard category (higher number) as shown in Table 912.4, existing elements of the means of egress shall comply with the requirements of Section 805 for the new occupancy classification. Newly constructed or configured means of egress shall comply with the requirements of Chapter 10 of the *International Building Code*.

Exceptions:

1. Any stairway replacing an existing stairway within a space where the pitch or slope cannot be reduced because of existing construction shall not be required to comply with the maximum riser height and minimum tread depth requirements.
2. Existing corridors shall be permitted to comply with the egress width capacity as determined by Table 604.2.

Reason: PART I - IBC Table 1005.1: The intent of this code change is to ensure coordination of requirements within the IBC. This is Part 4 of addressing the proposed new egress width factors in Table 1005.1 of the IBC (see PART 1) such that the impact of such revisions to Table 1005.1 will not be detrimental to existing building stock across the country when utilizing compliance alternatives in Chapter 34 of the IBC.

3403.5/IEBC 302.5: The intent of this code change is to ensure coordination of requirements within the IBC. This is Part 3 of addressing the proposed new egress width factors in Table 1005.1 such that the impact of such revisions to Table 1005.1 of the IBC (see PART 1) will not be detrimental to existing building stock across the country when making alterations in accordance with the requirements in Chapter 34 of the IBC.

3410.6.11/IEBC 1306.11: The intent of this code change is to revise the egress width factors in Table 1005.1 such that the concept of determining egress capacity for the components of the means of egress within a building is not a function of whether or not a building is protected throughout by an automatic fire sprinkler system. Not all building emergencies that necessitate occupant egress either out of a building or within a building to a safe area are dependent on a fire sprinkler system. Please also note that the occupancy factors are still unchanged for I-2 and H occupancies since all I-2 and H occupancies are required to be protected by an automatic fire sprinkler system.

PART II - The intent of this code change is to ensure coordination between the requirements in the IBC and the IFC. This is Part II of addressing the proposed new egress width factors in Table 1005.1 of the IBC (see PART I) such that the impact of such revisions to Table 1005.1 will not be detrimental to existing building stock across the country when enforcing the requirements of the IFC.

PART III - The intent of this code change is to ensure coordination between the requirements in the IBC and the IEBC. This is Part III of addressing the proposed new egress width factors in Table 1005.1 of the IBC (see PART I) such that the impact of such revisions to Table 1005.1 will not be detrimental to existing building stock across the country when enforcing the requirements of the IFC.

Cost Impact: The code change proposal will increase the cost of construction.

Analysis: IBC Section 3410.6.11 was revised to coordinate with IEBC Section 1301.6.11 by the CCC committee at their Sept. 2007 meeting. EB62-04/05 revise the general reference to IBC Chapter 10 in IEBC 1301.6.11 to the specific sections dealing with means of egress capacity and number.

Public Hearing Results

Errata: Modify tables and reason statements as follows:

PART I – IBC MEANS OF EGRESS

**TABLE 3410.6.11(1) [IEBC TABLE 1306.11.1(1)]
EGRESS WIDTH PER OCCUPANT SERVED**

OCCUPANCY	WITHOUT SPRINKLER SYSTEM		WITH SPRINKLER SYSTEM ^a	
	Stairways (inches per occupant)	Other egress components (inches per occupant)	Stairways (inches per occupant)	Other egress components (inches per occupant)
Occupancies other than those listed below	0.3	0.2	0.2	0.15
Hazardous: H-1, H-2, H-3 and H-4	Not permitted	Not permitted	0.3	0.2
Institutional: I-2	Not permitted	Not permitted	0.3 0.3	0.2

For SI: 1 inch – 25.4 mm.

- a. Buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2.

(Portions of proposal not shown remain unchanged)

REASON: PART I – IBC MEANS OF EGRESS

IBC Table 1005: The intent of this code change is to revise the egress width factors in Table 1005.1 such that the concept of determining egress capacity for the components of the means of egress within a building is not a function of whether or not a building is protected throughout by an automatic fire sprinkler system. Not all building emergencies that necessitate occupant egress either out of a building or within a building to a safe area are dependent on a fire sprinkler system. Please also note that the occupancy factors are still unchanged for I-2 and H occupancies since all I-2 and H occupancies are required to be protected by an automatic fire sprinkler system.

3403.5/IEBC 302.5: The intent of this code change is to ensure coordination of requirements within the IBC. This action will ensure coordination with the proposed new egress width factors in Table 1005.1 such that the impact of such revisions to Table 1005.1 of the IBC will not be detrimental to existing building stock across the country when making alterations in accordance with the requirements within the IBC and IEBC.

3410.6.11/IEBC 1306.11: The intent of this code change is to ensure coordination of requirements within the IBC. This action will ensure coordination with the proposed new egress width factors in Table 1005.1 such that the impact of such revisions to Table 1005.1 of the IBC will not be detrimental to existing building stock across the country when making alterations in accordance with the requirements within the IBC and IEBC.

PART II – IFC

**TABLE 1027.2
EGRESS WIDTH PER OCCUPANT SERVED**

OCCUPANCY	WITHOUT SPRINKLER SYSTEM		WITH SPRINKLER SYSTEM ^a	
	Stairways (inches per occupant)	Other egress components (inches per occupant)	Stairways (inches per occupant)	Other egress components (inches per occupant)
Occupancies other than those listed below	0.3	0.2	0.2	0.15
Hazardous: H-1, H-2, H-3 and H-4	Not permitted	Not permitted	0.3	0.2
Institutional: I-2	Not permitted	Not permitted	0.3 0.3	0.2

For SI: 1 inch – 25.4 mm.

a. Buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2.

(Portions of proposal not shown remain unchanged)

REASON: PART II - IFC

IFC 1027.2 - The intent of this code change is to ensure coordination between the requirements in the IBC and the IFC. This action will ensure coordination with the proposed new egress width factors in Table 1005.1 of the IBC (see PART I) such that the impact of such revisions to Table 1005.1 will not be detrimental to existing building stock across the country when enforcing the requirements of the IFC.

PART III – IEBC

**TABLE 604.2
EGRESS WIDTH PER OCCUPANT SERVED**

OCCUPANCY	WITHOUT SPRINKLER SYSTEM		WITH SPRINKLER SYSTEM ^a	
	Stairways (inches per occupant)	Other egress components (inches per occupant)	Stairways (inches per occupant)	Other egress components (inches per occupant)
Occupancies other than those listed below	0.3	0.2	0.2	0.15
Hazardous: H-1, H-2, H-3 and H-4	Not permitted	Not permitted	0.3	0.2
Institutional: I-2	Not permitted	Not permitted	0.3 0.3	0.2

For SI: 1 inch – 25.4 mm.

a. Buildings equipped throughout with an automatic sprinkler system in accordance with the *International Building Code* Section 903.3.1.1 or 903.3.1.2.

(Portions of proposal not shown remain unchanged)

PART III - IEBC

IEBC 604.2: The intent of this code change is to ensure coordination between the requirements in the IBC and the IEBC. This action will ensure coordination with the proposed new egress width factors in Table 1005.1 of the IBC (see PART I) such that the impact of such revisions to Table 1005.1 will not be detrimental to existing building stock across the country when enforcing the requirements of the IEBC.

IEBC 912.4.1: The intent of this code change is to ensure coordination between the requirements in the IBC and the IEBC. This action will ensure coordination with the proposed new egress width factors in Table 1005.1 of the IBC (see PART I) such that the impact of such revisions to Table 1005.1 will not be detrimental to existing building stock across the country when enforcing the requirements of the IEBC.

IEBC 912.4.2: The intent of this code change is to ensure coordination between the requirements in the IBC and the IEBC. This action will ensure coordination with the proposed new egress width factors in Table 1005.1 of the IBC (see PART I) such that the impact of such revisions to Table 1005.1 will not be detrimental to existing building stock across the country when enforcing the requirements of the IEBC.

PART I – IBC MEANS OF EGRESS**Committee Action:****Approved as Submitted**

Committee Reason: Occupants may need to egress buildings during non-fire events where sprinklers systems do not provide additional protection. Therefore, the increase in corridor and stairway width, and thus egress capacity, is justified.

Assembly Action:**None****PART II – IFC****Committee Action:****Approved as Modified****Modify the proposal as follows:**

1027.2 Minimum required egress width. The means of egress width shall not be less than as required by the code under which constructed but not less than as required by this section. The total width of means of egress in inches (mm) shall not be less than the total occupant load served by the means of egress multiplied by the factors in Table 1027.2 and not less than specified elsewhere in this section. Multiple means of egress shall be sized such that the loss of any one means of egress shall not reduce the available capacity to less than 50 percent of the required capacity. The maximum capacity required from any story of a building shall be maintained to the termination of the means of egress.

(Portions of Part II of proposal not shown remain unchanged)

CODE CHANGES RESOURCE COLLECTION – INTERNATIONAL BUILDING CODE

Committee Reason: For consistency with the action taken by the IBC-MOE Committee on Part I of this proposal and to provide correlation between IBC Chapter 10 and the existing building egress provisions of the IFC. The modification provides a more reasonable approach to existing buildings by allowing compliance with the original code of construction of the building as long as it is comparable to the new section.

Assembly Action: **None**

PART III – IEBC

Committee Action: **Disapproved**

Committee Reason: The proposal would require changes in egress width when minor alterations are made. This is an unreasonable trigger.

Assembly Action: **None**

Final Hearing Results

E19-07/08, Part I	AS
E19-07/08, Part II	AM
E19-07/08, Part III	D

Code Change No: E20-07/08

Original Proposal

Sections: 1005.2 (IFC [B] 1005.2)

Proponent: Philip Brazil, Reid Middleton, representing himself

Revise as follows:

1005.2 (IFC [B] 1005.2) (Supp) Encroachment. Doors, when fully opened, and handrails shall not reduce the required means of egress width by more than 7 inches (178 mm). Doors in any position shall not reduce the required width by more than one-half. Other nonstructural projections such as trim and similar decorative features ~~are~~ shall be permitted to project into the required width a maximum of 1.5 inches (38 mm) on each side.

Exception: The restrictions on a door swing shall not apply to doors within individual dwelling units and sleeping units of Group R-2 and dwelling units of Group R-3.

Reason: The purpose of the proposal is to more clearly convey the intent of the changes approved by Proposal E18-07/08-AM by eliminating nonmandatory language and establishing a more objective limit on nonstructural projections.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action: **Approved as Submitted**

Committee Reason: The additional language clarifies that the permitted projections are a maximum rather than an absolute.

Assembly Action: **None**

Final Hearing Results

E20-07/08	AS
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Code Change No: **E29-07/08**

Original Proposal

Sections: 1007.3 (IFC [B] 1007.3)

Proponent: Maureen Traxler, Planning & Development, City of Seattle, WA

Revise as follows:

1007.3 (IFC [B] 1007.3) (Supp) Exit stairways. In order to be considered part of an accessible means of egress, an exit stairway shall have a clear width of 48 inches (1219 mm) minimum between handrails and shall either incorporate an area of refuge within an enlarged floor-level landing or shall be accessed from either an area of refuge complying with Section 1007.6 or a horizontal exit.

Exceptions:

1. The area of refuge is not required at unenclosed interior exit stairways as permitted by Section 1020.1 in buildings ~~or facilities~~ that are equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2.
2. The clear width of 48 inches (1219 mm) between handrails is not required at exit stairways in buildings ~~or facilities~~ equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2.
3. Areas of refuge are not required at exit stairways in buildings ~~or facilities~~ equipped throughout by an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2.
4. The clear width of 48 inches (1219 mm) between handrails is not required for exit stairways accessed from a horizontal exit.
5. Areas of refuge are not required at exit stairways serving open parking garages.
6. Areas of refuge are not required for smoke protected seating areas complying with Section 1025.6.2.
7. The areas of refuge are not required in Group R-2 occupancies.

Reason: The phrase “or facilities” as used in this section is ambiguous. “Facility” is defined in Section 1102 broadly enough to include everything from a “portion of buildings” to “all ... structures... located on a site.” The definition raises the question whether, in order to use these exceptions, a sprinkler system is required in the entire building, in a portion of the building, or throughout the entire site. Removing “facilities” makes it clear that the entire building is required to be sprinklered, which is the most likely interpretation of the existing language. This interpretation is supported by the 2006 International Building Code Commentary that says, in reference to exception 2 of the 2006 IBC (which is now exception 1) “...for an unenclosed exit stairway ... in a building sprinklered in accordance with NFPA 13, an area of refuge is not required.” In regard to exception 3 (which is now exception 2), the Commentary says “Exception 3 exempts the 48-inch (1219 mm) width requirement in buildings sprinklered in accordance with NFPA 13 or NFPA 13R for both enclosed and unenclosed stairways.” (emphasis added.)

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The term facility as currently defined is vague. The deletion in the exceptions will make it clear that the entire building must be sprinklered for the exceptions to be applicable.

Assembly Action:

None

Final Hearing Results

E29-07/08

AS

Code Change No: **E34-07/08**

Original Proposal

Sections: 1007.6.3, 1007.6.4, 1007.9(New), 1007.9.1(New), 1007.9.2(New), [IFC [B] 1007.6.3, [B] 1007.6.4, [B]1007.9(New), [B]1007.9.1(New), [B]1007.9.2(New)]

Proponent: David Frable US General Services Administration

1. Add new sections as follows:

1007.9 (IFC [B] 1007.9) Two-way communication. A two-way communication system shall be provided at the elevator landing on each accessible floor that is one or more stories above or below the story of exit discharge complying with Sections 1007.9.1 and 1007.9.2.

Exceptions:

1. Two-way communication systems are not required at the elevator landing where the two-way communication system is provided within areas of refuge in accordance with Section 1007.6.3.
2. Two-way communication systems are not required on floors provided with exit ramps conforming to the provisions of Section 1010.

1007.9.1 (IFC 1007.9.1) System requirements. Two-way communication systems shall provide communication between each required location and the fire command center or a central control point location approved by the fire department. Where the central control point is not constantly attended, a two way communication system is permitted to be provided by a controlled access to a public telephone system. The two-way communication system shall include both audible and visible signals.

1007.9.2 (IFC [B] 1007.9.2) Directions. Directions for the use of the two-way communication system, instructions for summoning assistance via the two-way communication system, and written identification of the location, shall be posted adjacent to the two-way communication system.

2. Revise as follows:

1007.6.3 (IFC [B] 1007.6.3) Two-way communication. Areas of refuge shall be provided with a two-way communication system ~~between the area of refuge and a central control point. If the central control point is not constantly attended, the area of refuge shall also have ontrrolled access to a public telephone system. Location of the central control point shall be approved by the fire department. The two-way communication system shall include both audible and visible signals.~~ complying with Sections 1007.9.1 and 1007.9.2.

1007.6.4 (IFC [B] 1007.6.4) Instructions. In areas of refuge ~~that have a two-way emergency communications system,~~ instructions on the use of the area under emergency conditions shall be posted adjoining the communications system. The instructions shall include all of the following:

1. Directions to find other means of egress.
2. Persons able to use the exit stairway do so as soon as possible, unless they are assisting others.
3. ~~Information on planned availability of assistance in the use of stairs or supervised operation of elevators and how to summon such assistance.~~
4. ~~Directions for use of the emergency communications system.~~

Reason: The intent of this code change is to address an issue that has been raised by the disability community regarding the need to provide a two-way communication system on a floor for individuals unable to negotiate exit stairways during an emergency.

Current text only requires two-way communication systems within areas of refuge. Exceptions to Section 1007.3 and 1007.4 allow for the elimination of the area of refuge. This proposal will require two-way communication systems at the elevators on accessible levels other than the level of exit discharge. Exception 1 would avoid requiring a two-way communication system at the elevator when two-way communication was provided in the area of refuge. Exception 2 would avoid requiring a two-way communication system at the elevator when the floor level had ramps that allowed for independent evacuation, such as in a sports stadium.

In high rise building, typically, building occupant emergency plans use the elevator landings on each floor of a building as a staging area for individuals unable to negotiate exit stairways in an emergency. The new text proposed will provide an effective means for those individuals unable to negotiate exit stairways to communicate their location via a two-way communication system to either the fire command center or a central control point during an emergency condition. Signage will be provided with directions for operation of the system when provided at elevators and within areas of refuge.

The changes to Section 1007.6.3 and 1007.6.4 are for correlation only. Putting the two-way communication requirements in one section instead of repeating in two sections will eliminate possible conflicts in the future.

Another change addresses the issue of signage. These two changes will work separately or as a package.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Modified

Modify the proposal as follows:

1007.9.1 (IFC 1007.9.1) System requirements. Two-way communication systems shall provide communication between each required location and the fire command center or a central control point location approved by the fire department. Where the central control point is not constantly attended, a two way communication system shall have a timed automatic telephone dial-out capability to a monitoring location or 911 is permitted to be provided by a controlled access to a public telephone system. The two-way communication system shall include both audible and visible signals.

(Portions of proposal not shown remain unchanged)

Committee Reason: The modification will provide a clearer direction on how the phone system is expected to perform. The requirement for a two-way communication system at an elevator lobby does allow occupants to reach emergency responders to request assistance. This is important for persons with disabilities as well as others who may not be able to evacuate using the stairways. The lobby is an appropriate location since this is the point where most people will go since that is the area they are familiar with. Requirements should be addressed for multi-story buildings where elevators were not provided.

Assembly Action:

None

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because public comments were submitted.

Public Comment 1:

Dave Frable, US General Services Administration, requests Approval as Modified by this public comment.

Modify proposal as follows:

1007.6.4 (IFC [B] 1007.6.4) Instructions. In areas of refuge, instructions on the use of the area under emergency conditions shall be posted adjoining the communications system. The instructions shall include all of the following:

1. ~~Directions to find other means of egress.~~
2. ~~Persons able to use the exit stairway do so as soon as possible, unless they are assisting others.~~

1007.12 (IFC [B] 1007.12) Instructions. In areas of refuge and exterior areas for assisted rescue, instructions on the use of the area under emergency conditions shall be posted. The instructions shall include all of the following:

1. Persons able to use the exit stairway do so as soon as possible, unless they are assisting others.
2. Information on planned availability of assistance in the use of stairs or supervised operation of elevators and how to summon such assistance.
3. Directions for use of the two-way communications system where provided.

(Portions of proposal not shown remain unchanged)

Commenter's Reason: Code changes E34 and E35 were both approved. The result is a requirement for a two way communication system at elevators, and associated signage at the elevators and stairways that serve as part of an accessible means of egress. The original changes were written as stand alone pieces. Inadvertently, the approval of E34 deleted text that is needed for a complete package. This modification is a coordination of requirements between the two changes. The text for signage as it stands now is indicated below. The proposed modification is intended to add Items 2 and 3 in Section 1007.12.

1007.10 Signage. Signage indicating special accessibility provisions shall be provided as shown:

1. Each door providing access to an area of refuge from an adjacent floor area shall be identified by a sign stating: AREA OF REFUGE.

2. Each door providing access to an exterior areas for assisted rescue shall be identified by a sign stating: EXTERIOR AREA FOR ASSISTED RESCUE.

Signage shall comply with the ICC A117.1 requirements for visual characters and including the International Symbol of Accessibility. Where exit sign illumination is required by Section 1011.2, the signs shall be illuminated. Additionally, tactile signage complying with ICC A117.1 shall be located at each door to an area of refuge and exterior area for assisted rescue in accordance with Section 1011.3.

1007.11 Directional signage. Direction signage indicating the location of the other means of egress and which are accessible means of egress shall be provided at the following:

1. At exits serving a required accessible space but not providing an approved accessible means of egress.
2. At elevator landings.
3. Within areas of refuge.

1007.12 Instructions. In areas of refuge and exterior areas for assisted rescue, instructions on the use of the area under emergency conditions shall be posted. The instructions shall include all of the following:

1. Persons able to use the exit stairway do so as soon as possible, unless they are assisting others.

Final Hearing Results

E134-07/08

AMPC1

Code Change No: E35-07/08

Original Proposal

Sections: 1007.6.4, 1007.6.5, 1007.7, 1007.8.3, 1007.9(New), 1007.10(New), 1011.3, 1110.1, 1110.2, 1110.3, [IFC [B] 1007.6.4, [B]1007.6.5, [B]1007.7, [B]1007.8.3, [B]1007.9 (New), [B] 1007.10(New)]; IFC 404.3.2

Proponent: David Frable US General Services Administration

THESE PROPOSALS ARE ON THE AGENDA OF THE IBC MEANS OF EGRESS AND THE IFC CODE DEVELOPMENT COMMITTEES AS 2 SEPARATE CODE CHANGES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IBC

1. Add new sections as follows:

1007.9 (IFC [B] 1007.9) Signage. Signage indicating special accessibility provisions shall be provided as shown:

1. Each door providing access to an area of refuge from an adjacent floor area shall be identified by a sign stating: AREA OF REFUGE.
2. Each door providing access to an exterior areas for assisted rescue shall be identified by a sign stating: EXTERIOR AREA FOR ASSISTED RESCUE.

Signage shall comply with the ICC A117.1 requirements for visual characters and including the International Symbol of Accessibility. Where exit sign illumination is required by Section 1011.2, the signs shall be illuminated. Additionally, tactile signage complying with ICC A117.1 shall be located at each door to an area of refuge and exterior area for assisted rescue in accordance with Section 1011.3.

1007.10 (IFC [B] 1007.10) Directional signage. Direction signage indicating the location of the other means of egress and which are accessible means of egress shall be provided at the following:

1. At exits serving a required accessible space but not providing an approved accessible means of egress.
2. At elevator landings.
3. Within areas of refuge.

2. Revise as follows:

~~1007.6.4 (IFC [B] 1007.6.4) 1007.12 (IFC [B] 1007.12) Instructions.~~ In areas of refuge and exterior areas for assisted rescue that have a two-way emergency communications system, instructions on the use of the area under emergency conditions shall be posted adjoining the communications system. The instructions shall include all of the following:

- ~~1. Directions to find other means of egress.~~
- ~~2. 1. Persons able to use the exit stairway do so as soon as possible, unless they are assisting others.~~
- ~~3. 2. Information on planned availability of assistance in the use of stairs or supervised operation of elevators and how to summon such assistance.~~
- ~~4. 3. Directions for use of the emergency two-way communications system where provided.~~

~~1007.6.5 (IFC [B] 1007.6.5) Signage.~~ Each door providing access to an area of refuge from an adjacent floor area shall be identified by a sign complying with ICC A117.1, stating: AREA OF REFUGE, and including the International Symbol of Accessibility. Where exit sign illumination is required by Section 1011.2, the area of refuge sign shall be illuminated. Additionally, tactile signage complying with ICC A117.1 shall be located at each door to an area of refuge.

~~1007.7 (IFC [B] 1007.7) Signage.~~ At exits and elevators serving a required accessible space but not providing an approved accessible means of egress, signage shall be installed indicating the location of accessible means of egress.

~~1007.8.3 (IFC [B] 1007.8.3) Identification.~~ Exterior areas for assisted rescue shall have identification as required for area of refuge that complies with Section 1007.6.5.

1011.2 (IFC [B] 1011.2) Illumination. Exit signs shall be internally or externally illuminated.

Exception: Tactile signs required by Section 1011.3 need not be provided with illumination.

1011.3 (IFC [B] 1011.3) (Supp) Tactile exit signs. A tactile sign stating EXIT and complying with ICC A117.1 shall be provided adjacent to each door to an area of refuge, an exterior area for assisted rescue, an egress stairway, an exit passageway and the exit discharge.

SECTION 1110 SIGNAGE

1110.1 Signs. Required accessible elements shall be identified by the International Symbol of Accessibility at the following locations:

1. Accessible parking spaces required by Section 1106.1 except where the total number of parking spaces provided is four or less.
2. Accessible passenger loading zones.
- ~~3. Accessible areas of refuge required by Section 1007.6.~~
- ~~4. 3. Accessible rooms where multiple single-user toilet or bathing rooms are clustered at a single location.~~
- ~~5. 4. Accessible entrances where not all entrances are accessible.~~
- ~~6. 5. Accessible check-out aisles where not all aisles are accessible. The sign, where provided, shall be above the check-out aisle in the same location as the check-out aisle number or type of check-out identification.~~
- ~~7. 6. Unisex toilet and bathing rooms.~~
- ~~8. 7. Accessible dressing, fitting and locker rooms where not all such rooms are accessible.~~
8. Accessible areas of refuge in accordance with Section 1007.9
9. Exterior areas for assisted rescue in accordance with Section 1007.9.

1110.2 Directional signage. Directional signage indicating the route to the nearest like accessible element shall be provided at the following locations. These directional signs shall include the International Symbol of Accessibility:

1. Inaccessible building entrances.
2. Inaccessible public toilets and bathing facilities.
3. Elevators not serving an accessible route.
4. At each separate-sex toilet and bathing room indicating the location of the nearest unisex toilet or bathing room where provided in accordance with Section 1109.2.1.
5. At exits and elevators and exit stairways serving a required accessible space, but not providing an approved accessible means of egress, signage shall be provided in accordance with Section 1007.7 1007.10.

1110.3 Other signs. Signage indicating special accessibility provisions shall be provided as shown:

1. Each assembly area required to comply with Section 1108.2.6 shall provide a sign notifying patrons of the availability of assistive listening systems.

Exception: Where ticket offices or windows are provided, signs are not required at each assembly area provided that signs are displayed at each ticket office or window informing patrons of the availability of assistive listening systems.

2. At each door to an area of refuge, an exterior area for assisted rescue, an egress stairway, exit passageway and exit discharge, signage shall be provided in accordance with Section 1011.3.
3. At areas of refuge, signage shall be provided in accordance with Sections 1007.6.3 through 1007.6.5 and 1007.9.
4. At exterior areas for assisted rescue, signage shall be provided in accordance with Section ~~1007.8.3~~ 1007.9.
5. At two way communication systems, signage shall be provided in accordance with Section 1007.12.

PART I – IFC

Revise text as follows.

404.3.2 (Supp) Fire safety plans. Fire safety plans shall include the following:

1. The procedure for reporting a fire or other emergency.
2. The life safety strategy and procedures for notifying, relocating, or evacuating occupants, including occupants who need assistance.
3. Site plans indicating the following:
 - 3.1. The occupancy assembly point.
 - 3.2. The locations of fire hydrants.
 - 3.3. The normal routes of fire department vehicle access.
4. Floor plans identifying the locations of the following:
 - 4.1. Exits.
 - 4.2. Primary evacuation routes.
 - 4.3. Secondary evacuation routes.
 - 4.4. Accessible egress routes.
 - 4.5. Areas of refuge.
 - 4.6. Exterior areas for assisted rescue.
 - 4.7. Designated locations for persons unable to use the general means of egress unassisted per the facilities fire evacuation plan
 - 4.7. ~~4.8~~ Manual fire alarm boxes.
 - 4.8. ~~4.9~~ Portable fire extinguishers.
 - 4.9. ~~4.10~~ Occupant-use hose stations.
 - 4.10. ~~4.11~~ Fire alarm annunciators and controls.
5. A list of major fire hazards associated with the normal use and occupancy of the premises, including maintenance and housekeeping procedures.
6. Identification and assignment of personnel responsible for maintenance of systems and equipment installed to prevent or control fires.
7. Identification and assignment of personnel responsible for maintenance, housekeeping and controlling fuel hazard sources.

Reason: The reason for this code change proposal is to address an issue that has been raised by the disability community regarding the availability of information for individuals unable to negotiate exit stairways during an emergency. Exceptions to Section 1007.3 and 1007.4 allow for the elimination of the area of refuge. With the deletion of the area of refuge, there is limited information for people on where assistance for evacuation will be provided.

The intent of this proposal is to provide signage at: the following locations.

- Since most people will tend to go back to the elevator first, information must be available at the elevator that indicates to persons that they can stay there for assistance or directional signage to where they can go for assistance (e.g. stairways, areas of refuge, exterior areas for rescue assistance).
- Signage must be provided at area or refuge and exterior areas of rescue assistance.
- Directional signage must be provided at any exit or exit stairway that does not serve as part of an accessible means of egress.

The signage information needed for accessible means of egress has been grouped in a new Section 1007.9 and 1007.10. This information would be coordinated with the fire and safety evacuation plans (IFC Section 404.3). Changes to Section 1011 are coordination only.

Another change addresses the two-way communication. These two changes will work separately or as a package.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing Results

PART I – IBC MEANS OF EGRESS

Committee Action:

Approved as Submitted

Committee Reason: The proposed text provides necessary information for exiting direction.

Assembly Action:

None

PART II – IFC

Committee Action:

Withdrawn by Proponent

Final Hearing Results

E35-07/08, Part I	AS
E35-07/08, Part II	WP

Code Change No: E39-07/08

Original Proposal

Sections: 1008.1.2, 1008.1.2.1 (New) [IFC [B] 1008.1.2, [B] 1008.1.2.1 (New)]

Proponent: Gary Miller, City of Irving, TX, representing North Texas Chapter of ICC

1. Revise as follows:**1008.1.2 (IFC [B] 1008.1.2) (Supp) Door swing.** Egress doors shall be of the pivoted or side-hinged swinging type.**Exceptions:**

1. Private garages, office areas, factory and storage areas with an occupant load of 10 or less.
2. Group I-3 occupancies used as a place of detention.
3. Critical or intensive care patient rooms within suites of health care facilities.
4. Doors within or serving a single dwelling unit in Groups R-2 and R-3.
5. In other than Group H occupancies, revolving doors complying with Section 1008.1.3.1.
6. In other than Group H occupancies, horizontal sliding doors complying with Section 1008.1.3.3 are permitted in a means of egress.
7. Power-operated doors in accordance with Section 1008.1.3.2.
8. Doors serving a bathroom within an individual sleeping unit in Group R-1.
9. In other than Group H occupancies, manually operated horizontal sliding doors are permitted in a means of egress from spaces with an occupant load of 10 or less.

Doors shall swing in the direction of egress travel where serving an occupant load of 50 or more persons or a Group H occupancy.

2. Add new text as follows:**1008.1.2.1 (IFC [B] 1008.1.2.1) Double-acting doors.** Double-acting doors shall not be used as doors in a means of egress where any of the following conditions exist:

1. The occupant load served by the door is 100 or more.
2. The door is part of a fire door assembly.
3. The door is part of an opening in a smoke barrier.
4. Panic hardware is required or provided on the door.

A double-acting door shall be provided with a view panel of not less than 200 square inches (0.129 m²).

Reason: This proposal will clarify and add new requirements to the Code. As this section is currently written, egress doors equipped with pivot hardware are prohibited from use, and double-acting doors are allowed without any limiting or clarifying language.

Although pivot doors and side-hinged doors function in a nearly identical manner, they are different devices with pivot hardware typically being installed on the bottom and top edges of doors rather than on the side. The omission of pivot type doors from the door swing section of the IBC has been consistent since the 2000 Edition, but they were included as an allowed door type in at least one of the legacy codes (UBC). The 2006 IBC includes at least two direct references and one indirect reference to pivot hardware: (1) Section 715.4.1 designates test standards for "Side-hinged and pivoted swinging doors; (2) Section 1002 includes a reference to "double-pivoted hardware" in the definition of the term "balanced door"; (3) Section 1008.1.9 identifies installation criteria "If balanced doors are used and panic hardware is required . . ." – the implied assumption being that pivots serve as the hinge device of the balanced door. Pivot doors are commonly used, especially on glass doors, and should be allowed as long as they meet the other applicable code provisions such as opening force and clear opening width.

Double-acting doors are doors that swing in both directions, are also in common usage, and should continue to be allowed, but with some restrictions. Proposed Section 1008.1.2.1 is wording that is taken from the 1997 UBC with minor terminology updates. Restriction #1 addresses a practical threshold beyond which the use of double-acting doors would create a potentially unsafe emergency exiting condition; restrictions #2 & #3 address practical limitations since double-acting doors are incapable of providing positive latching; restriction #4 adds another practical restriction in that doors equipped with panic hardware should only swing in one direction. The last sentence in this section requires the installation of a view panel in order to lessen the chance of a person being struck by the door which is being blindly pushed open from the opposite side.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: Section 1008.1.2 is a clarification that pivoted and side hinged are both acceptable. The committee had concerns with new Section 1008.1.2.1. It is unclear if the 100 person occupant load is cumulative from both sides, from each side or from the total floor. The viewing panels may be privacy issue in double acting doors used in patient rooms or bathrooms. The location of the viewing panel needs to be stated so that they will achieve their purpose.

Assembly Action:

None

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Steve Thomas, Colorado Code Consulting LLC, representing Colorado Chapter of ICC, requests Approval as Modified by this public comment.

Maureen Traxler, City of Seattle, WA, representing Washington Association of Building Officials Technical Code Development Committee, requests Approval as Modified by this public comment.

Modify proposal as follows:

1008.1.2 (IFC [B] 1008.1.2) (Supp) Door swing. Egress doors shall be of the pivoted or side-hinged swinging type.

Exceptions:

1. Private garages, office areas, factory and storage areas with an occupant load of 10 or less.
2. Group I-3 occupancies used as a place of detention.
3. Critical or intensive care patient rooms within suites of health care facilities.
4. Doors within or serving a single dwelling unit in Groups R-2 and R-3.
5. In other than Group H occupancies, revolving doors complying with Section 1008.1.3.1.
6. In other than Group H occupancies, horizontal sliding doors complying with Section 1008.1.3.3 are permitted in a means of egress.
7. Power-operated doors in accordance with Section 1008.1.3.2.
8. Doors serving a bathroom within an individual sleeping unit in Group R-1.
9. In other than Group H occupancies, manually operated horizontal sliding doors are permitted in a means of egress from spaces with an occupant load of 10 or less.

Doors shall swing in the direction of egress travel where serving an occupant load of 50 or more persons or a Group H occupancy.

1008.1.2.1 (IFC [B] 1008.1.2.1) Double-acting doors. ~~Double-acting doors shall not be used as doors in a means of egress where any of the following conditions exist:~~

- ~~1. The occupant load served by the door is 100 or more.~~
- ~~2. The door is part of a fire door assembly.~~
- ~~3. The door is part of an opening in a smoke barrier.~~
- ~~4. Panic hardware is required or provided on the door.~~

~~A double-acting door shall be provided with a view panel of not less than 200 square inches (0.129 m²).~~

Commenter's Reason: (Thomas) The committee felt that Item 1 of the proposed change was reasonable, but they did not like Item 2. This public comment keeps the language of Item 1 and deletes the language from Item 2. The original proposal added the words "of the pivoted or" to Section 1008.1.2. This would clarify that the use of pivot hinged doors provides the same action of the door swing requirements in the code.

Commenter's Reason: (Traxler) Pivoted doors are a safe and reasonable alternative to side-hinged swinging doors. The Code Development Committee's reason for disapproving this code change proposal included the statement "pivoted and side hinged doors are both acceptable." Section 1008.1.2 of the code change proposal should be approved.

Final Hearing Results

E39-07/08

AMPC

Code Change No: E41-07/08

Original Proposal

Sections: 1008.1.3.4 (IFC [B] 10081.3.4)

Proponent: John Williams, Washington State Department of Health, Construction Review Services, representing Washington Association of Building Officials, Technical Code Development Committee

Revise as follows:

1008.1.3.4 (IFC [B] 1008.1.3.4) Access-controlled egress doors. The entrance doors in a means of egress in buildings with an occupancy in Group A, B, E, I-2, M, R-1 or R-2 and entrance doors to tenant spaces in occupancies in Groups A, B, E, I-2, M, R-1 and R-2 are permitted to be equipped with an approved entrance and egress access control system which shall be installed in accordance with all of the following criteria:

1. A sensor shall be provided on the egress side arranged to detect an occupant approaching the doors. The doors shall be arranged to unlock by a signal from or loss of power to the sensor.
2. Loss of power to that part of the access control system which locks the doors shall automatically unlock the doors.
3. The doors shall be arranged to unlock from a manual unlocking device located 40 inches to 48 inches (1016mm to 1219 mm) vertically above the floor and within 5 feet (1524 mm) of the secured doors. Ready access shall be provided to the manual unlocking device and the device shall be clearly identified by a sign that reads "PUSH TO EXIT." When operated, the manual unlocking device shall result in direct interruption of power to the lock—independent of the access control system electronics—and the doors shall remain unlocked for a minimum of 30 seconds.
4. Activation of the building fire alarm system, if provided, shall automatically unlock the doors, and the doors shall remain unlocked until the fire alarm system has been reset.
5. Activation of the building automatic sprinkler or fire detection system, if provided, shall automatically unlock the doors. The doors shall remain unlocked until the fire alarm system has been reset.
6. Entrance doors in buildings with an occupancy in Group A, B, E or M shall not be secured from the egress side during periods that the building is open to the general public.

Reason: The purpose of this code change is to clarify the intent of the current code. Healthcare facilities are being asked by the Department of Homeland Security to "harden their facilities" and plan for biological, radiological or epidemic disasters. Hospitals need to control access into their facilities by funneling the arriving public through a planned triage point, such as an emergency department. Without this control, infected or contaminated persons could enter at various unsecured points and spread contamination throughout the building as they made their way to the emergency room. Access control systems, such as the one described in section 1008.1.3.4, can be used to mitigate this circumstance. However, this section does not list these systems as allowable in I-2 occupancies. This is overly restrictive and inconsistent with other sections of this code.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The proposal to add Group I-2 to allow access controlled egress doors allows for improved security in hospital areas, such as at the entrance to a maternity ward. This type of lock is already being used throughout Group I-2 facilities.

Assembly Action:

None

Final Hearing Results

E41-07/08

AS

Code Change No: **E45-07/08**

Original Proposal

Sections: 1008.1.8.4, (IFC [B] 1008.1.8.4)

Proponent: Thomas W. Hanson AIA, The Boeing Company

Revise as follows:

1008.1.8.4 (IFC [B] 1008.1.8.4) Bolt locks. Manually operated flush bolts or surface bolts are not permitted.

Exceptions:

1. On doors not required for egress in individual dwelling units or sleeping units.
2. Where a pair of doors serves a storage or equipment room, manually operated edge- or surface-mounted bolts are permitted on the inactive leaf.
3. Where a pair of doors serves a Group B, F or S occupancy, manually operated edge- or surface-mounted bolts are permitted on the inactive leaf provided such inactive leaf is not needed to meet egress width requirements and the building is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1. The inactive leaf shall contain no doorknobs, panic bars or similar operating hardware.

Reason: The purpose of this proposal is to provide for the expanded use of manually operated edge- or surface-mounted bolts under specified conditions. The movement of equipment and computer racks within Group B, F and S occupancies is a commonplace operation that often requires more width than is provided by a standard 3'-0" door. The currently required hardware on additional door leaves can be complicated to specify and problematic to maintain as the operational requirements are different for doors accommodating equipment as opposed to occupants during egress. A number of compensatory measures have been offered in this proposed exception so as to minimize the risk to the occupants of such spaces. There is generally a high degree of occupant familiarity with such special use rooms in Group B, F and S occupancies. The provision that means of egress width requirements be satisfied by the operating leaf ensures that occupants have a fully complying door available for means of egress purposes. Also, the requirement that the inactive leaf contain no operating hardware addresses occupant conditioning. The presence of operating hardware provides an expectation to building occupants. Where no such hardware exists, occupants will naturally approach the active leaf having the appropriate hardware. The additional requirement that the building be equipped throughout with an approved automatic sprinkler system provides for fire suppression throughout the building and further enhances overall occupant safety. Approval of this additional exception will increase building functionality while maintaining a very high degree of occupant safety.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The proposal clarifies when surface bolts can be used on non-active leaves of doors. The inactive leaf is not needed for means of egress and the no hardware requirement will make sure this is not considered part of the door. The automatic fire suppression system provides additional compensation. This proposal may need to be expanded to other occupancies such as Group A or M.

Assembly Action:

None

Final Hearing Results

E45-07/08

AS

Code Change No: **E46-07/08**

Original Proposal

Sections: 1008.1.8.4, (IFC [B] 1008.1.8.4)

Proponent: Thomas W. Hanson, AIA, The Boeing Company

Revise as follows:

1008.1.8.4 (IFC [B] 1008.1.8.4) Bolt locks. Manually operated flush bolts or surface bolts are not permitted.

Exceptions:

1. On doors not required for egress in individual dwelling units or sleeping units.
2. Where a pair of doors serves a storage or equipment room, manually operated edge- or surface-mounted bolts are permitted on the inactive leaf.
3. Where a pair of doors serves an occupant load of less than 50 persons in a Group B, F or S occupancy, manually operated edge- or surface-mounted bolts are permitted on the inactive leaf. The inactive leaf shall contain no doorknobs, panic bars or similar operating hardware.

Reason: The purpose of this proposal is to provide for the expanded use of manually operated edge- or surface-mounted bolts under specified conditions. Inasmuch as a single 3'-0" door will accommodate an occupant load in excess of 200 persons, if a relatively small space in a Group B, F or S occupancy is equipped with a pair of doors, it is highly likely that such increased width is necessary for the movement of process related equipment or supplies. Automatic surface mounted flush bolts and removable door center posts are easily damaged and difficult to maintain in such areas of frequent equipment movement. A number of compensatory measures have been offered in this proposal so as to minimize the risk to the occupants of such spaces. There is generally a high degree of occupant familiarity with such special use rooms in Group B, F and S occupancies. Placing a less than 50 person occupant load limitation on the area served by the pair of doors greatly increases occupant awareness and decreases competition for the exit or exit access door. Also, the requirement that the inactive leaf contain no operating hardware addresses occupant conditioning. The presence of operating hardware provides an expectation to building occupants. Where no such hardware exists, occupants will naturally approach the active leaf having the appropriate hardware. Approval of this additional exception will increase building functionality while maintaining a very high degree of occupant safety.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: This proposal allows design flexibility and functionality. The 50 person limit provides for an additional level of safety. The inactive leaf is not needed for means of egress and the no hardware requirement will make sure this is not considered part of the door. This proposal may need to be expanded to other occupancies such as Group A or M.

Assembly Action:

None

Final Hearing Results

E46-07/08

AS

Code Change No: **E47-07/08**

Original Proposal

Sections: 1008.1.8.4 (IFC [B] 1008.1.8.4)

Proponent: Bruce Ugelstad, NCARB, MeritCare Health System

Revise as follows:

1008.1.8.4 (IFC [B] 1008.1.8.4) Bolt locks. Manually operated flush bolts or surface bolts are not permitted.

Exceptions:

1. On doors not required for egress in individual dwelling units or sleeping units.
2. Where a pair of doors serves a storage or equipment room, manually operated edge- or surface-mounted bolts are permitted on the inactive leaf.
3. Where a pair of doors serve patient care rooms in a Group I-2 occupancy, manually operated edge- or surface-mounted bolts are permitted on the inactive leaf.

Reason: The American society has increasingly become overweight creating the need to care for increasingly more bariatric hospital patients. The movement of morbidly obese patients on bariatric beds through 4' wide doors is a difficult process at best. Providing a pair of doors with a typically fixed inactive leaf except during the movement of the patient would greatly improve the situation. With the active leaf of the door typically open for the monitoring of the patient by the nursing staff, automatic flush bolts would not keep the inactive leaf latched in the closed position as preferred.

Allowing hospital patient care room inactive leaf doors to be equip with standard flush bolts will:

- A) Improve the quality of care to hospital patients allowing smooth and easy transport of patients to and from rooms without moving the patient to a transport cart and providing adequate opening size allowing minimal incidence of jarring when the bed bumps the door or wall.
- B) Reduce the risk of injury to medical staff by reducing the need to move (lift) the patient on and off of transport carts.

Section 407.3.1 Corridor doors – Code currently indicates that patient room doors "...shall not have a required fire protection rating and shall not be required to be equipped with self closing or automatic-closing devices, but shall provide an effective barrier to limit the transfer of smoke and shall be equipped with positive latching." Hospital patient room doors are recognized as unique with staff trained to close doors during an alarm situation.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: While the need for this allowance is understood, there are some problems with the proposed language. The language needs to be expanded to say that no hardware is permitted on the door so that it is not perceived as a door. A needed clarification is that the remaining door leaf must meet the egress width of 41-1/2" inches. Language similar to what was approved for E45 and E46 may provide guidance.

Assembly Action:

None

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Bruce Ugelstad, NCARB, MeritCare Health System, requests Approval as Modified by this Public Comment.

Douglas S. Erickson, FASHE, CHFM, HFDP, American Society for Healthcare Engineering, requests As Modified by this public comment.

Modify proposal as follows:

1008.1.8.4 (IFC [B] 1008.1.8.4) Bolt locks. Manually operated flush bolts or surface bolts are not permitted.

Exceptions:

1. On doors not required for egress in individual dwelling units or sleeping units.
2. Where a pair of doors serves a storage or equipment room, manually operated edge- or surface-mounted bolts are permitted on the inactive leaf.
3. Where a pair of doors serves patient care rooms in a Group I-2 occupancy, ~~manually operated~~ self-latching edge- or surface-mounted bolts are permitted on the inactive leaf provided that the inactive leaf is not needed to meet egress width requirements and the inactive leaf contains no doorknobs, panic bars or similar operating hardware.

Commenter's Reason: (Ugelstad) The modified code change proposal will satisfy a real need of medical staff and will not compromise safety to patients and building occupants. The modification changed manual latching device to a self latching hardware device. This hardware type is manufactured by Ives FB61T "Constant latch", Hager 294D "Self latching", DCI 905 "Self Latching". The function of self latching hardware is to provide a latch and strike at the top of the door and frame, so that when the door is pushed against the stop, the door will latch.

In Palm Springs, the following concerns were raised:

- 1) Manual latching would require excessive time to secure the inactive leaf during an emergency.
Response: The self latching bolt will secure when closed reducing the time required securing the door leaf.
- 2) The inactive leaf should not be considered as required egress width and should not be equip with door knobs, panic bars or similar operating hardware.
Response: The added wording "provided that the inactive leaf is not needed to meet egress width requirements and the inactive leaf contains no doorknobs, panic bars or similar operating hardware." will address this concern.

Commenter's Reason: (Erickson) I am writing in support of the proposed code change being presented by Mr. Bruce Ugelstad, MeritCare Health System. The issue he is representing, needing to increase the typical door opening to a patient room, is a global problem facing the health care industry, as more of our patients are morbidly obese.

For over a century, the 44" or 48" patient room door has been adequate to permit the efficient transfer of patients to and from their rooms. Over this past decade however, we are struggling with the size of the patient door opening, as the equipment has gotten larger in order to support the increase size and weight of the patient. The purpose for increasing the size of this opening is not for life safety in an emergency, as the typical methods of transporting these patients from their room in an emergency have not changed. The purpose of this proposed change is to assist staff in easily moving equipment and patients to and from their rooms on a daily basis without damaging the doors or injuring themselves by trying to tilt or lift equipment to fit through the opening.

Mr. Ugelstad explains this situation very well in his proposed change. One thing that needs to be added to his substantiation, is that these are not Bariatric patient rooms where the patient is large enough to mandate larger patient room door openings for life safety and evacuation purposes.

Our membership is very interested in the work of the ICC and we stand ready to assist in any manner you and the organization see as appropriate.

Final Hearing Results

E47-07/08

AMPC

Code Change No: E48-07/08

Original Proposal

Sections: 1008.1.8.5.1 (New) [IFC [B] 1008.1.8.5.1 (New)]

Proponent: Tom Lariviere, Madison Fire Department, representing Joint Fire Service Review Committee

Add new text as follows:

1008.1.8.5.1. (IFC [B] 1008.1.8.5.1) Closet and bathroom doors in Group R-4 Occupancies. In Group R-4 occupancies, closet doors that latch in the closed position shall be openable from inside the closet, and bathroom doors that latch in the closed position shall be capable of being unlocked from the ingress side.

Reason: This proposal will require that doors to closets must be openable from the inside. This will provide the ability for someone to exit the closet if they were to get closed into the closet.

Additionally, the bathroom doors must be able to be unlocked from the outside of the bathroom when the door is locked from the inside. This will allow for the door to still be locked when the bathroom is in use, but staff can open the bathroom door when someone is inside and needs assistance.

Cost Impact: This code change proposal will increase the cost of construction

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The committee approved the special locking arrangements for closets and bathrooms in Group R-4 because it was needed for safety of the individuals. The MOE committee disapproved a similar proposal for Group I-1 patient rooms and bathrooms in G81-06/07. The committee would like to see these requirements coordinated to address the concerns for the occupants in these similar types of facilities.

Assembly Action:

None

Final Hearing Results

E48-07/08

AS

Code Change No: **E51-07/08**

Original Proposal

Sections: 1008.1.8.6 (New) [IFC [B] 1008.1.8.6 (New)]

Proponent: John Williams, Construction Review Services, Washington State Department of Health, Emory Rogers, Virginia Department of Housing and Community Development, John Neff City of Lacey, WA, representing Washington State Building Code Council

Add new text as follows:

1008.1.8.6 (IFC [B] 1008.1.8.6) Special locking arrangements in Group I-2. Where the clinical needs of patients require the restraint of movement, locks shall be permitted on doors within the means of egress, provided that:

1. The building is equipped with an approved automatic sprinkler system in accordance with Section 903.3.1.1, and an approved automatic fire alarm system in accordance with Section 907.
2. The doors unlock upon actuation of the automatic fire alarm system, or, upon the loss of power to the lock or lock mechanism.
3. The doors are capable of being unlocked by a signal from a switch at a nurse station or other approved location.
4. An electronic device, such as a keypad and code, is provided adjacent to each door equipped with a lock. Such device shall deactivate the door locking mechanism and permit operation of the door. Instructions for exiting shall be posted within six feet of the door.
5. All clinical staff shall have the codes or other means necessary to operate the device in Item #4.

Reason: This change provides a much needed option for facilities that house dementia and Alzheimer's patients. There is a reoccurring issue with elopement of dementia patients. Facilities that house these patients face significant challenges in maintaining a safe and secure environment for these patient types within the framework of the building code. The States of Washington and Virginia have amended the building code with similar special provisions for dementia control. The conditions that allow this special locking arrangement provide a measured approach to life safety, similar to delayed egress. We use this as a practical solution to a real world problem.

There were three proposals last cycle that dealt with this concept, all were defeated by the committee. Two changes were turned down in favor of a third amendment (G83-06/07) that was almost identical to this one. The committee turned down G83-06/07 due to concerns that patients would learn to pull the fire alarm to get out of the building. An existing exception to IBC 907.2.6 allows the fire alarm pulls to be located at nurse stations and other constantly staff attended locations, which mitigates this concern.

To address other committee concerns: We believe that while there may be occupancies that may house these types of patients, it is clear that Group I-2 definitely houses these patients. The purpose of this change is targeted towards a verifiable condition. The committee preferred the language "clinical staff" as opposed to "all staff". This change has been made

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The proponent requested disapproval based on the committee actions to E44-07/08 and E49-07/08. They intend to work with the Code Technologies Committee Care Facility task group to address this issue.

Assembly Action:

None

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because public comments were submitted.

Public Comment 1:

Paul K. Heilstedt, PE, FAIA, Chair, representing ICC Code Technology Committee (CTC) requests Approval as Modified by this public comment.

Replace proposal as follows:

1008.1.8.6 (IFC [B] 1008.1.8.6) Special locking arrangements in Group I-2. Approved delayed egress locks shall be permitted in a Group I-2 occupancy where the clinical needs of persons receiving care require such locking. Delayed egress locks shall be permitted in such occupancies where the building is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or an approved automatic smoke or heat detection system installed in accordance with Section 907, provided that the doors unlock in accordance with Items 1 through 6 below. A building occupant shall not be required to pass through more than one door equipped with a delayed egress lock before entering an exit.

1. The doors unlock upon actuation of the automatic sprinkler system or automatic fire detection system.
2. The doors unlock upon loss of power controlling the lock or lock mechanism.
3. The door locks shall have the capability of being unlocked by a signal from the fire command center, a nursing station or other approved location.
4. The procedures for the operation(s) of the unlocking system shall be described and approved as part of the emergency planning and preparedness required by Chapter 4 of the *International Fire Code*.
5. All clinical staff shall have the keys, codes or other means necessary to operate the locking devices.
6. Emergency lighting shall be provided at the door.

Exception: Items 1 through 3 shall not apply to doors to areas where persons which because of clinical needs require restraint or containment as part of the function of a mental hospital.

[Re-number subsequent sections]

Commenter's Reason: As noted in the reason for disapproval, the proponent recognized that this issue falls within the scope of the CTC area of study entitled "Care Facilities". The CTC care facility study group invited the interested stakeholders to discuss how best to address locking arrangements necessary to both balance the needs of the facility as well as the life safety of the occupants. The proposed revisions are fundamentally based on the current provisions of Section 1008.1.8.6, with the exception of items 4 and 5 which have been replaced by items 4, 5 and 6.

Items 4 and 5 in current Section 1008.1.8.6 require an audible signal to be initiated in the event of the delayed egress lock being activated. This is reasonable for occupancy Groups A, E and H, however, there are special considerations necessary where the occupants are in different environments in Group I-2 hospitals. Such audible signals are considered as nuisance alarms in areas where the patients are under a form of restraint and as such they have been replaced by items 4, 5, and 6 which provides a reasonable mechanism to monitor and allow the unlocking system to be activated.

Hospitals which contain patients with mental disabilities present even more of a challenge in that they need to be restrained and/or contained for their own safety. For these occupancies, it is imperative that the level of restraint be maintained even if the fire protection systems are activated. However, in order to provide the necessary life safety features which would allow for such patients to be evacuated, the emergency planning and preparedness plan must be developed to allow for such evacuation (Item 5) and the clinical staff have the ability to monitor and enable the evacuation (Item 6).

Code issues are assigned to the CTC by the ICC Board as "areas of study". Information on the CTC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CTC effort can be downloaded from the following website: <http://www.iccsafe.org/cs/cc/ctc/index.html>. Since its inception in April/2005, the CTC has held fifteen meetings - all open to the public. This public comment is a result of the CTC's investigation of the area of study entitled "Care Facilities". The CTC web page for this area of study is: <http://www.iccsafe.org/cs/cc/ctc/care.html>

Final Hearing Results

E51-07/08

AMPC1

Code Change No: E52-07/08

Original Proposal

Sections: 1008.1.8.8 (New) [IFC [B] 1008.1.8.8 (New)]

Proponent: A. Brooks Ballard, Virginia Department of Corrections

Add new text as follows:

1008.1.8.8 (IFC [B] 1008.1.8.8) Locking arrangements in correctional facilities. In occupancies in Groups A-2, A-3, A-4, B, E, F, I-2, I-3, M and S within correctional and detention facilities, doors in means of egress serving rooms or spaces occupied by persons whose movements are controlled for security reasons shall be permitted to be locked when equipped with egress control devices which shall unlock manually and by at least one of the following means:

1. Activation of an automatic sprinkler system installed in accordance with Section 903.3.1.1,
2. Activation of an approved manual alarm box, or
3. A signal from a constantly attended location.

Reason: This section permits the locking of means of egress doors in areas within penal facilities that contain occupancies in Use Groups A-2, A-3, A-4, B, E, F, I-2, M and S, which are occupied by persons who must be restrained for security reasons. In Section 410.2, the code provides for locking of doors in the means of egress in mixed occupancies containing a Group I-3 use area. Correctional and detention facilities, however, often are a complex of buildings that do not necessarily have a Group I-3 classification in each building, but one which still require high levels of security throughout. This section is intended to regulate those areas. All locking devices must be capable of manual unlocking by at least one of the egress control devices specified. Such arrangements are deemed satisfactory to permit prompt egress for the building occupants because correctional and detention facilities are ordinarily continuously staffed with trained personnel. Further, the provisions for backup by activation of an automatic sprinkler system, activation of an approved manual alarm box, or unlocking from a constantly attended location, provide additional life safety measures. Note that in order to utilize this section, an automatic sprinkler system or manual alarm system is not required to be provided.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: A concern may be if this could be considered to conflict with Section 1008.1.8.3 Item 1.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The requirements in Chapter 4 for Group I-3 do not address a campus type setting. The proposed language fills that void.

Assembly Action:

None

Final Hearing Results

E52-07/08

AS

Code Change No: **E53-07/08**

Original Proposal

Sections: 1008.1.9, 1008.1.9.1 (New), 1008.1.9.2 (New) [IFC [B] 1008.1.9, [B] 1008.1.9.1 (New), [B] 1008.1.9.2 (New)]

Proponent: Philip Brazil, PE, Reid Middleton, Inc., representing himself

Revise as follows:

1008.1.9 (IFC [B]1008.1.9) Panic and fire exit hardware. ~~Where panic and fire exit hardware is installed, it shall comply with the following:~~

- ~~1. The actuating portion of the releasing device shall extend at least one-half of the door leaf width.~~
- ~~2. The maximum unlatching force shall not exceed 15 pounds (67 N).~~

Each door in a means of egress from a Group A or E occupancy having an occupant load of 50 or more and any Group H occupancy shall not be provided with a latch or lock unless it is panic hardware or fire exit hardware.

Exception: A main exit of a Group A occupancy in compliance with Section 1008.1.8.3, Item 2.

Electrical rooms with equipment rated 1,200 amperes or more and over 6 feet (1829 mm) wide that contain overcurrent devices, switching devices or control devices with exit or exit access doors shall be equipped with panic hardware ~~and or fire exit hardware~~. The doors shall swing in the direction of egress travel.

1008.1.9.1 (IFC [B] 1008.1.9.1) Installation. ~~Where panic or fire exit hardware is installed, it shall comply with the following:~~

1. The actuating portion of the releasing device shall extend at least one-half of the door leaf width; and
2. The maximum unlatching force shall not exceed 15 pounds (67 N)

1008.1.9.2 (IFC [B] 1008.1.9.2) Balanced doors. If balanced doors are used and panic hardware is required, the panic hardware shall be the push-pad type and the pad shall not extend more than one-half the width of the door measured from the latch side.

Reason: Section 1008.1.9 intends to require panic hardware or fire exit hardware under certain conditions, then, specify requirements for their installation including maximum unlatching forces. The current language, however, specifies the installation requirements prior to establishing when panic hardware or fire exit hardware is required. The proposal rearranges the language by stating when panic or fire exit hardware is required, then, stating their installation requirements.

Section 715.4 on fire door and shutter assemblies requires compliance with NFPA 80 and Section 6.4.4.1 of NFPA 80-07 effectively limits locks and latches on fire doors to labeled locks and latches and labeled fire exit hardware. Thus, panic hardware is prohibited on fire doors. Panic hardware and fire exit hardware are permitted to meet the requirements of Section 1008.1.9 on nonrated means of egress doors but only fire exit hardware is permitted to meet the same requirements on means of egress doors that are also fire doors. Based on this, the proposal adds fire exit hardware as an option to the requirement for panic hardware at electrical rooms.

The other changes are primarily editorial and to better correlate Section 1008.1.9 with the other provisions of Chapter 10. "Must" is changed to "shall" to eliminate nonmandatory language. "Exit access doors" is changed to "exit or exit access doors" so that means of egress doors in the exit are not excluded from the applicable requirements and to better correlate with the provisions of Section 1015 on exit and exit access doorways. A means of egress door from an electrical room could be an exit door as readily as an exit access door. "Egress" is changed to "egress travel" to correlate with similar language in Section 1008.1.2 on door swing.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The proposal clarifies the difference between panic and fire exit hardware. Fire exit hardware is panic listed for fire door assemblies. This coordinates with NFPA 80. The reorganization puts scoping before technical requirements which makes more sense.

Assembly Action:

None

Final Hearing Results

E53-07/08

AS

Code Change No: **E54-07/08**

Original Proposal

Sections: 1008.1.9, Chapter 35 (New) (IFC [B] 1008.19, Chapter 45 (New))

Proponent: Bob Eugene, Underwriters Laboratories, Inc.

1. Revise as follows:

1008.1.9 (IFC [B] 1008.1.9) Panic and fire exit hardware. Where panic and fire exit hardware is installed, it shall comply with the following:

1. Panic hardware shall be listed in accordance with UL 305.
2. Fire exit hardware shall be listed in accordance with UL 10C and UL 305.
- 4.3. The actuating portion of the releasing device shall extend at least one-half of the door leaf width.
2. ~~The maximum unlatching force shall not exceed 15 pounds (67 N).~~

Each door in a means of egress from a Group A or E occupancy having an occupant load of 50 or more and any Group H occupancy shall not be provided with a latch or lock unless it is panic hardware or fire exit hardware.

Exception: A main exit of a Group A occupancy in compliance with Section 1008.1.8.3, Item 2.

Electrical rooms with equipment rated 1,200 amperes or more and over 6 feet (1829 mm) wide that contain overcurrent devices, switching devices or control devices with exit access doors shall be equipped with panic hardware and doors shall swing in the direction of egress.

If balanced doors are used and panic hardware is required, the panic hardware shall be the push-pad type and the pad shall not extend more than one-half the width of the door measured from the latch side.

2. Add standard to Chapter 35 (IFC Chapter 45) as follows:

Underwriters Laboratories

305-07 Panic Hardware

Reason: This proposal is intended to simplify code enforcement related to approval of panic hardware by requiring it to be listed in accordance with UL 305. For many years panic and fire exit hardware has been listed in accordance with this standard, and over 60 companies have their panic hardware listed and over 40 companies have their fire exit hardware listed.

UL 305 includes a comprehensive set of construction and performance requirements that verify that this important life safety product operates as intended. This includes endurance, emergency operation, elevated ambient exposure, and low temperature impact tests.

The standard currently includes a requirement for the release mechanism to be constructed so that a horizontal force of 15 pounds (66 N) or less will actuate the actuating bar and latches when the door is latched. This requirement (item 2) is being deleted from the body of the code since the listed panic hardware has already been investigated to verify it already meets this criteria.

ANSI/UL 305 is an ANSI approved standard.

Cost Impact: The code change proposal will not increase the cost of the construction.

Public Hearing Results

Note: The following analysis was not in the Code Change Proposal book but was posted on the ICC website.

Analysis: Review of proposed new standard UL-305 indicated that, in the opinion of ICC Staff, the standard did comply with ICC standards criteria.

Committee Action:

Approved as Modified

Modify the proposal as follows. Maintain current Exception 2 as new Exception 4.

1008.1.9 (IFC [B] 1008.1.9) Panic and fire exit hardware. Where panic and fire exit hardware is installed, it shall comply with the following:

1. Panic hardware shall be listed in accordance with UL 305.
2. Fire exit hardware shall be listed in accordance with UL 10C and UL 305.
3. The actuating portion of the releasing device shall extend at least one-half of the door leaf width.
4. The maximum unlatching force shall not exceed 15 pounds (67 N).

Each door in a means of egress from a Group A or E occupancy having an occupant load of 50 or more and any Group H occupancy shall not be provided with a latch or lock unless it is panic hardware or fire exit hardware.

Exception: A main exit of a Group A occupancy in compliance with Section 1008.1.8.3, Item 2.

Electrical rooms with equipment rated 1,200 amperes or more and over 6 feet (1829 mm) wide that contain overcurrent devices, switching devices or control devices with exit access doors shall be equipped with panic hardware and doors shall swing in the direction of egress.

If balanced doors are used and panic hardware is required, the panic hardware shall be the push-pad type and the pad shall not extend more than one-half the width of the door measured from the latch side.

(Portions of proposal not shown remain unchanged)

Committee Reason: The modification to keep the current Exception 2 for the 15 pounds force should be maintained in the code for several reasons. If UL305 is revised, the building code would still control the force required for panic hardware. The code official may not have a copy of UL305. The International Fire Code is partially a maintenance code, so they need the pounds force in the text. Putting the UL 305 specification into the code provides good guidance in the code for panic hardware requirements. See E53-07/08 for reorganization of this section.

Assembly Action:

None

Final Hearing Results

E54-07/08

AM

Code Change No: E55-07/08

Original Proposal

Sections: 1008.1.9 (IFC [B] 1008.1.9)

Proponent: Philip Brazil, PE, Reid Middleton, Inc., representing himself

Revise as follows:

1008.1.9 (IFC [B] 1008.1.9) Panic and fire exit hardware. Where panic and fire exit hardware is installed, it shall comply with the following:

1. The actuating portion of the releasing device shall extend at least one-half of the door leaf width.
2. The maximum unlatching force shall not exceed 15 pounds (67 N).

Each door in a means of egress ~~from~~ servicing a Group A or E occupancy ~~having~~ with an occupant load of 50 or more ~~and any or a~~ Group H occupancy shall not be provided with a latch or lock unless it is panic hardware or fire exit hardware.

Exception: A main exit of a Group A occupancy in compliance with Section 1008.1.8.3, Item 2.

Electrical rooms with equipment rated 1,200 amperes or more and over 6 feet (1829 mm) wide that contain overcurrent devices, switching devices or control devices with exit access doors shall be equipped with panic hardware and doors shall swing in the direction of egress.

If balanced doors are used and panic hardware is required, the panic hardware shall be the push-pad type and the pad shall not extend more than one-half the width of the door measured from the latch side.

Reason: For Group A and E occupancies, the current language limits the requirement for panic hardware or fire exit hardware to means of egress from the occupancy, thus, exempting the means of egress within the Group A or E occupancy from the requirement. This is not the intent and the proposal corrects this oversight.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The proposed language clarifies that panic hardware is required at intervening doors as well as doors leading from spaces.

Assembly Action:

None

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Lori Lee Graham, City of Portland, OR, representing herself, requests Approval as Modified by this public comment.

Modify proposal as follows:

1008.1.9 (IFC [B] 1008.1.9) Panic and fire exit hardware. Where panic and fire exit hardware is installed, it shall comply with the following:

1. The actuating portion of the releasing device shall extend at least one-half of the door leaf width.
2. The maximum unlatching force shall not exceed 15 pounds (67 N).

~~Each door in a means of egress serving a Group A or E occupancy with an occupant load of 50 or more or a Group H occupancy. Doors serving a Group H occupancy and doors serving rooms or spaces with an occupant load of 50 or more in a Group A or E occupancy shall not be provided with a latch or lock unless it is panic hardware.~~

Exception: A main exit of a Group A occupancy in compliance with Section 1008.1.8.3, Item 2.

Electrical rooms with equipment rated 1,200 amperes or more and over 6 feet (1829 mm) wide that contain overcurrent devices, switching devices or control devices with exit access doors shall be equipped with panic hardware and doors shall swing in the direction of egress.

If balanced doors are used and panic hardware is required, the panic hardware shall be the push-pad type and the pad shall not extend more than one-half the width of the door measured from the latch side.

Commenter's Reason: The intent of Public Comment is an editorial improvement. As approved by the committee, the section would require that all doors in an A or E occupancy over 50 would need panic hardware. This would include rooms within the A or E occupancy that individually have less than 50 occupants. The revision changes it to requiring panic hardware where the room or space has 50 occupants. It retains the original proponents "serving" so that it is the whole chain of doors from the space to the exit.

Final Hearing Results

E55-07/08

AMPC

Code Change No: **E57-07/08**

Original Proposal

Sections: 1009.2 (IFC [B] 1009.2); IRC R311.5.2

Proponent: David W. Cooper, Stairway Manufacturers' Association

THESE PROPOSALS ARE ON THE AGENDA OF THE IBC MEANS OF EGRESS AND THE IRC BUILDING/ENERGY CODE DEVELOPMENT COMMITTEES AS 2 SEPARATE CODE CHANGES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IBC MEANS OF EGRESS

Revise as follows:

1009.2 (IFC [B] 1009.2) Headroom. Stairways shall have a minimum headroom clearance of 80 inches (2032 mm) measured vertically from a line connecting the edge of the nosings. Such headroom shall be continuous above the stairway to the point where the line intersects the landing below, one tread depth beyond the bottom riser. The minimum clearance shall be maintained the full width of the stairway and landing that is available for placement of the foot in ascent or descent.

Exceptions:

1. Spiral stairways complying with Section 1009.8 are permitted a 78-inch (1981 mm) headroom clearance.
2. In Group R-3 occupancies; within dwelling units in Group R-2 occupancies; and in Group U occupancies that are accessory to a Group R-3 occupancy or accessory to individual dwelling units in Group R-2 occupancies; the edge of a floor opening shall be permitted to project 4.75 inches (121 mm) maximum into the required headroom where guards or handrails on open sides of stairways below are located beyond the edge of the opening, provided that all required stairway widths are provided and the space between the top of an angled guard or handrail and the bottom of the projection shall not narrow to less than 6 inches (152 mm) measured vertically.

PART II – IRC BUILDING AND ENERGY

Revise as follows:

R311.5.2 Headroom. The minimum headroom in all parts of the stairway shall not be less than 6 feet 8 inches (2036 mm) measured vertically from the sloped plane adjoining the tread nosing or from the floor surface of the landing or platform on that portion of the stairway that is available for placement of the foot in ascent or descent.

Exception:The edge of a floor opening shall be permitted to project 4.75 inches (121 mm) maximum into the required headroom where guards or handrails on open sides of stairways below are located beyond the edge of the opening, provided that all required stairway widths are provided and the space between the top of an angled guard or handrail and the bottom of the projection shall not narrow to less than 6 inches (152 mm) measured vertically.

Reason: Part I- IBC -This is a required change to assure consistent code enforcement and compliance and eliminate the possibility of entrapment. The change to the charging paragraph supports current enforcement policies around the country and more clearly states the intent of the code. Headroom is simply not required where you cannot walk. The code currently allows extending the line of measurement beyond the limit of the "walkable" surface causing legal issues in court interpretations and provides no additional level of safety for the user. Nosings of treads on open stairs most often over lap the supporting wall and stringer below. This supporting wall is placed under the opening above in alignment with the edge of the opening below (see diagram 1) and in the strictest sense of the code as worded now would trigger a headroom violation as successive treads approached the ceiling of the floor above.

The reason for the exception is best illustrated in the photographs attached. The reasons for the exception are also soundly rooted in the most common current application of the code. This necessary alignment of the walls in relation to the edge of the floor openings is understood and not interpreted as a headroom violation in most jurisdictions. There is currently no limit however to the effective projection that is being allowed. Moving the handrails or guards in onto the stairs narrows the exit path unnecessarily without eliminating the current codes literal headroom violation and can create an undesired climbable surface beyond the guard. This code change puts the necessary limits in place and provides an additional level of safety by:

1. Standardizing the most commonly understood current enforcement policies for headroom.
2. Addressing needed prevention of entrapment of an appendage or object being carried in ascent in the narrowing space that is formed when an angled guard or handrail approaches intersection with the ceiling of the next floor or level above. (See photos 1 & 2)

3. Recognizing the standard methods of construction used in the placement and framing of supporting walls and floor systems associated with the perimeter of the openings for stairways. (See diagrams1) In particular it specifies a maximum projection into the headroom space that is based upon the required attachment of a guard/handrail system to the face of a supporting wall sitting solidly on the floor system and limits it to the nominal width of a finished 2 x 4 wall.
4. Allowing the currently accepted methods to transfer stairway loads to the surrounding structure and space saving stacking of stairs and landings in wells without adding juxtaposition support walls that would narrow the stairwells below if the edge of the stair and supporting wall were moved from under the opening above.
5. Allowing the guards and handrails to be positioned such as to widen the stairway in descent, the most common egress direction. (See photos 1 & 2)
6. Allowing the secure attachment of the end of guard/handrail systems providing for the required transfer of loads to the structure.

Part II-IRC: This is a required change to assure consistent code enforcement and compliance and eliminate the possibility of entrapment. The change to the charging paragraph supports current enforcement policies around the country and more clearly states the intent of the code. Headroom is simply not required where you cannot walk. The code currently allows extending the plane of measurement beyond the limit of the "walkable" surface causing legal issues in court interpretations and provides no additional level of safety for the user. Nosings of treads on open stairs most often overlap the supporting wall and stringer below. This supporting wall is placed under the opening above in alignment with the edge of the opening below (see diagram 1) and in the strictest sense of the code as worded now would trigger a headroom violation as successive treads approached the ceiling of the floor above.

The reason for the exception is best illustrated in the photographs attached. The reasons for the exception are also soundly rooted in the most common current application of the code. This necessary alignment of the walls in relation to the edge of the floor openings is understood and not interpreted as a headroom violation. There is currently no limit however to the effective projection that is being allowed. Moving the handrails or guards in onto the stairs narrows the exit path unnecessarily without eliminating the current codes literal headroom violation and can create an undesired climbable surface beyond the guard. This code change puts the necessary limits in place and provides an additional level of safety by:

1. Standardizing the most commonly understood current enforcement policies for headroom.
2. Addressing needed prevention of entrapment of an appendage or object being carried in ascent in the narrowing space that is formed when an angled guard or handrail approaches intersection with the ceiling of the next floor or level above. (See photos 1 & 2)
3. Recognizing the standard methods of construction used in the placement and framing of supporting walls and floor systems associated with the perimeter of the openings for stairways. (See diagram1) In particular it specifies a maximum projection into the headroom space that is based upon the required attachment of a guard/handrail system to the face of a supporting wall sitting solidly on the floor system and limits it to the nominal width of a finished 2 x 4 wall.
4. Allowing the currently accepted methods to transfer stairway loads to the surrounding structure and space saving stacking of stairs and landings in wells without adding juxtaposition support walls that would narrow the stairwells below if the edge of the stair and supporting wall were moved from under the opening above.
5. Allowing the guards and handrails to be positioned such as to widen the stairway in descent, the most common egress direction. (See photos 1 & 2)
6. Allowing the secure attachment of the end of guard/handrail systems providing for the required transfer of loads to the structure.



Photo 1

Photo 2

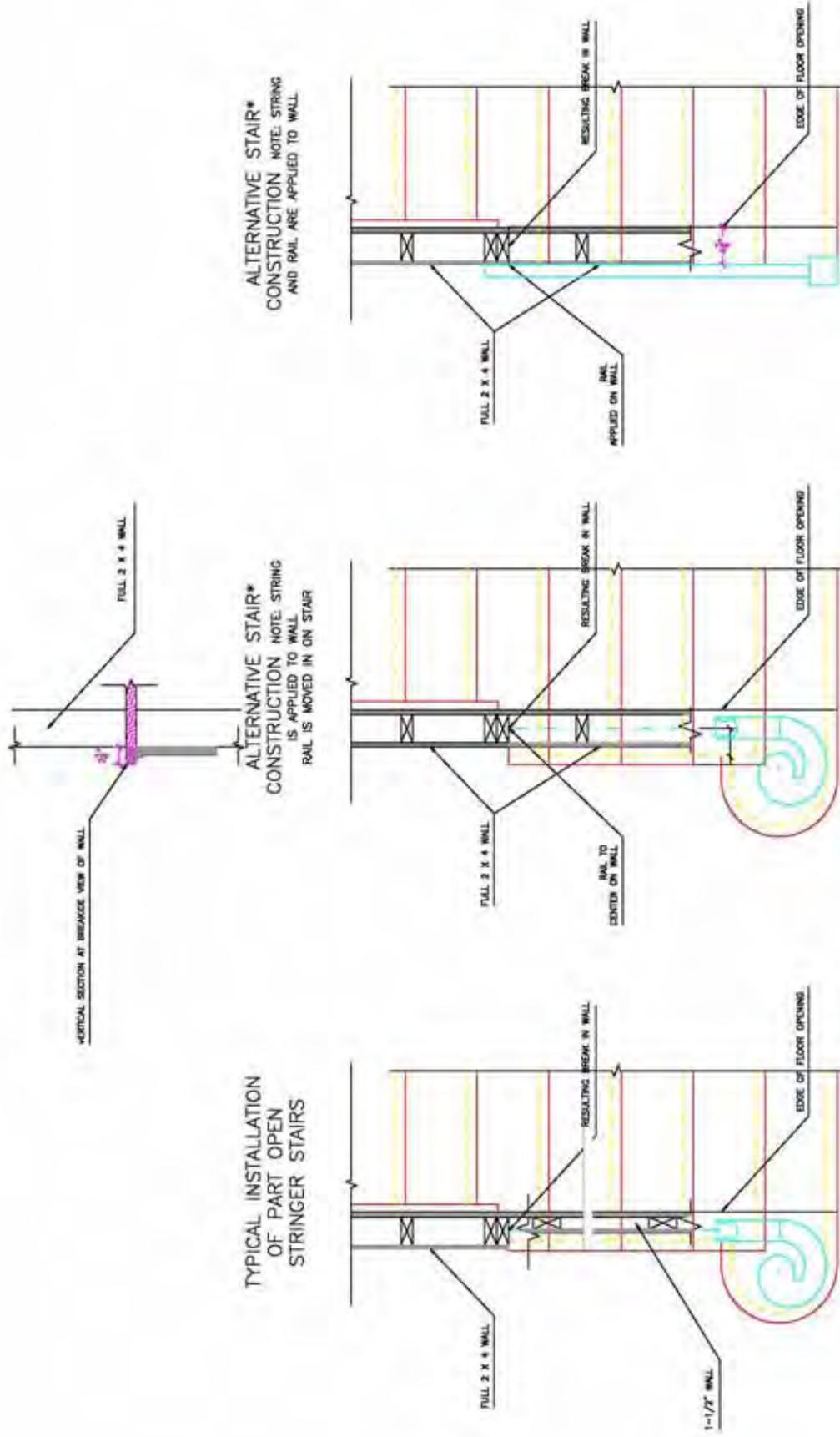


Diagram 1 – TYPICAL WALL SECTIONS AT STAIRS IN PLAN VIEW

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

PART I – IBC MEANS OF EGRESS

Committee Action:

Disapproved

Committee Reason: The proposed language is ambiguous. Indicating that the minimum clearance is required for the full length of the stairway would be clearer.

Assembly Action:

None

PART II – IRC-B/E

Committee Action:

Approved as Submitted

Committee Reason: The proposal adds clarity on how to measure headroom in relation to stairways in relation to established walk lines. Further, the committee supported the new exception that provides a new method for addressing guards and railings on open sides of stairways.

Assembly Action:

None

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted for Part I.

Public Comment:

David W. Cooper, Stairway Manufacturing and Design Consulting, representing Stairway Manufacturers Association, requests Approval as Modified by this public comment.

Modify Part I of proposal as follows:

1009.2 (IFC [B] 1009.2) Headroom. Stairways shall have a minimum headroom clearance of 80 inches (2032 mm) measured vertically from a line connecting the edge of the nosings. Such headroom shall be continuous above the stairway to the point where the line intersects the landing below, one tread depth beyond the bottom riser. The minimum clearance shall be maintained the full width of the stairway and landing that is available for placement of the foot in ascent or descent.

Exceptions:

1. Spiral stairways complying with Section 1009.8 are permitted a 78-inch (1981 mm) headroom clearance.
2. In Group R-3 occupancies; within dwelling units in Group R-2 occupancies; and in Group U occupancies that are accessory to a Group R-3 occupancy or accessory to individual dwelling units in Group R-2 occupancies; ~~the edge of a floor opening shall be permitted to project 4.75 inches (121 mm) maximum into the required headroom where guards or handrails on open sides of stairways below are located beyond the edge of the opening, provided that all required stairway widths are provided and the space between the top of an angled guard or handrail and the bottom of the projection shall not narrow to less than 6 inches (152 mm) measured vertically. Where the nosings of treads at the side of a flight extend under the edge of a floor opening through which the stair passes, the floor opening shall be allowed to project horizontally into the required headroom a maximum of 4-3/4 inches (121 mm).~~

Commenter's Reason – Part I: The modification addresses the committees concerns and clarifies the intent of the exception by removing language that could be incorporated in the handrail and guard sections in the next cycle. The need for this residential exception is well illustrated in the photos offered with the original proposal. This is a common situation in residential construction that allows the guard to terminate securely in the end of a wall at the side of a well opening for a stair. The modification clearly reflects the most commonly accepted interpretation of headroom compliance when a flight of stairs widens at the bottom and the nosings extend under the ceiling above beyond the upper stair width. The proposal further improves the code by and limiting the projection to no more than 4¾ inches, the width of a finished 2 X 4 wall. Approval as modified would support the action taken by the IRC committee.

Public Comment:

David W. Cooper, Stairway Manufacturing and Design Consulting, representing Stairway Manufacturers Association, requests Approval as Modified by this public comment for Part II.

Modify Part II of proposal as follows:

R311.5.2 Headroom. The minimum headroom in all parts of the stairway shall not be less than 6 feet 8 inches (2036 mm) measured vertically from the sloped-plane line adjoining the tread nosing or from the floor surface of the landing or platform on that portion of the stairway that is available for placement of the foot in ascent or descent.

Exception: The edge of a floor opening shall be permitted to project 4.75 inches (121 mm) maximum into the required headroom where guards or handrails on open sides of stairways below are located beyond the edge of the opening, provided that all required stairway widths are provided and the space between the top of an angled guard or handrail and the bottom of the projection shall not narrow to less than 6 inches (152 mm) measured vertically. Where the nosings of treads at the side of a flight extend under the edge of a floor opening through which the stair passes, the floor opening shall be allowed to project horizontally into the required headroom a maximum of 4-3/4 inches (121 mm)

Commenter's Reason – Part II: The committee approved the original proposal but asked that we clarify the original language submitted by public comment. The modification addresses the committees concerns and clarifies the intent of the exception by separating language that can be incorporated in the handrail and guard sections in the next cycle. The need for this residential exception is well illustrated in the photos offered with the original proposal. This is a common situation in residential construction that allows the guard to terminate securely in the end of a wall at the side of a well opening for a stair. The modification clearly reflects the most commonly accepted interpretation of headroom compliance when a flight of stairs widens at the bottom and the nosings extend under the ceiling above beyond the upper stair width. The proposal further improves the code by limiting the projection to no more than 4¾ inches, the width of a finished 2 X 4 wall.

Final Hearing Results

E57-07/08, Part I
E57-07/08, Part II

AMPC
AMPC

Code Change No: E58-07/08

Original Proposal

Sections: 1009.3, 1009.3.2 (IFC [B] 1009.3, 1009.3.2); IRC R311.5.2.3 (New), R311.5.3.2

Proponent: David W. Cooper, Stairway Manufacturers' Association

THESE PROPOSALS ARE ON THE AGENDA OF THE IBC MEANS OF EGRESS AND THE IRC BUILDING/ENERGY CODE DEVELOPMENT COMMITTEES AS 2 SEPARATE CODE CHANGES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IBC MEANS OF EGRESS

Add new text as follows:

1009.3 (IFC [B] 1009.3) Walk line. The walk line is the line of travel used to provide for uniform layout of the tread depths in the design and regulation of flights with winder treads. The walk line shall be parallel to the side of the flight where the treads are narrowest and located 12 inches (305 mm) from the point of minimum tread depth used for placement of the foot on the flight in ascent or descent.

Revise as follows:

1009.3 (IFC [B] 1009.3) 1009.4 (IFC [B] 1009.4) Stair treads and risers. Stair riser heights shall be 7 inches (178 mm) maximum and 4 inches (102 mm) minimum. ~~Stair tread depths shall be 11 inches (279 mm) minimum.~~ The riser height shall be measured vertically between the leading edges of adjacent treads. ~~Rectangular tread depths shall be 11 inches (279 mm) minimum~~ The tread depth shall be measured horizontally between the vertical planes of the foremost projection of adjacent treads and at a right angle to the tread's leading edge. Winder treads shall have a minimum tread depth of 11 inches (279 mm) measured between the vertical planes of the foremost projection of adjacent treads at the intersections with the walk line at a right angle to the tread's leading edge at a point 12 inches (305 mm) from the side where the treads are narrower and a minimum tread depth used for placement of the foot ascent or descent of 10 inches (254 mm).

Exceptions:

1. Alternating tread devices in accordance with Section 1009.9.
2. Spiral stairways in accordance with Section 1009.8.

3. Aisle stairs in assembly seating areas where the stair pitch or slope is set, for sightline reasons, by the slope of the adjacent seating area in accordance with Section 1025.11.2.
4. In Group R-3 occupancies; within dwelling units in Group R-2 occupancies; and in Group U occupancies that are accessory to a Group R-3 occupancy or accessory to individual dwelling units in Group R-2 occupancies; the maximum riser height shall be 7.75 inches (197 mm); the minimum tread depth shall be 10 inches (254 mm); the minimum winder tread depth at the walk line shall be 10 inches (254 mm); and the minimum winder tread depth shall be 6 inches (152 mm). A nosing not less than 0.75 inch (19.1 mm) but not more than 1.25 inches (32 mm) shall be provided on stairways with solid risers where the tread depth is less than 11 inches (279 mm).
5. See the Section 3403.4 for the replacement of existing stairways.

~~1009.3.1 (IFC [B] 1009.3.1)~~ 1009.4.1 (IFC [B] 1009.4.1) Winder treads. (No change to text)

~~1009.3.2 (IFC [B] 1009.3.2)~~ 1009.4.2 (IFC [B] 1009.4.2) Dimensional uniformity. Stair treads and risers shall be of uniform size and shape. The tolerance between the largest and smallest riser height or between the largest and smallest tread depth shall not exceed 0.375 inch (9.5 mm) in any flight of stairs. The greatest winder tread depth at the ~~12-inch (305 mm)~~ walk line within any flight of stairs shall not exceed the smallest by more than 0.375 inch (9.5 mm) ~~measured at a right angle to the tread's leading edge.~~

Exceptions:

1. Nonuniform riser dimensions of aisle stairs complying with Section 1025.11.2.
2. Consistently shaped winders, complying with Section 1009.3, differing from rectangular treads in the same stairway flight.

Where the bottom or top riser adjoins a sloping publicway, walkway or driveway having an established grade and serving as a landing, the bottom or top riser is permitted to be reduced along the slope to less than 4 inches (102 mm) in height, with the variation in height of the bottom or top riser not to exceed one unit vertical in 12 units horizontal (8-percent slope) of stairway width. The nosings or leading edges of treads at such nonuniform height risers shall have a distinctive marking stripe, different from any other nosing marking provided on the stair flight. The distinctive marking stripe shall be visible in descent of the stair and shall have a slip-resistant surface. Marking stripes shall have a width of at least 1 inch (25 mm) but not more than 2 inches (51 mm).

~~1009.3.3 (IFC [B] 1009.3.3)~~ 1009.4.3 (IFC [B] 1009.4.3) Profile. (No change to text)

PART II – IRC BUILDING AND ENERGY

Revise as follows:

R311.5.2.3 Walk line. The walk line is the line of travel used to provide for uniform layout of the tread depths in the design and regulation of flights with winder treads. The walk line shall be parallel to the side of the flight where the treads are narrowest and located 12 inches (305 mm) from the point of minimum tread depth used for placement of the foot on the flight in ascent or descent.

R311.5.3.2 Tread depth. The minimum tread depth shall be 10 inches (254 mm). The tread depth shall be measured horizontally between the vertical planes of the foremost projection of adjacent treads and at a right angle to the tread's leading edge. The greatest tread depth within any flight of stairs shall not exceed the smallest by more than 3/8 inch (9.5 mm). Winder treads shall have a minimum tread depth of 10 inches (254 mm) measured between the vertical planes of the foremost projection of adjacent treads at the intersections with the walk line ~~as above at a point 12 inches (305 mm) from the side where the treads are narrower.~~ Winder treads shall have a minimum tread depth used for placement of the foot in ascent or descent of 6 inches (152 mm) at any point. Within any flight of stairs, the largest winder tread depth at the ~~12-inch (305 mm)~~ walk line shall not exceed the smallest winder tread by more than 3/8 inch (9.5 mm).

Reason: PART I – IBC

Need for Improvement:

Current regulation of the placement of the walk line varies for lack of a specific point from which to measure. The tread depth measured at the walk line therefore varies from one enforcement jurisdiction to another sometimes even within a jurisdiction. The complications of varying interpretations of this part of the code have lead to costly hearings and appeals for variances. The industry needs a standard as do code officials but more importantly the people walking these stairs need a standard as well that will provide consistency in the built environment. In this effort the Stairway Manufacturers' Association has offered several proposals over the years that have met with an agreement by the committees involved that *a standard is needed* but with certain objections. Each proposal in succession has improved utilizing the critical direction obtained from the committees in the code development process and in meetings with code officials around the country.

Separate Section on Walk Line is Needed:

The walk line is a critical element of stair design just as are width, headroom, rise and run. The separation of this element draws attention to the need to meet this requirement in the planning stage rather than being buried within the code. This allows for further specifics for location and simplification of the subsequent sections relative to tread depth. Finally although the term walk line has been used for years with in the code text on tread depth, this section offers a clear understanding.

What is the “Walk Line”:

The walk line is related to the person’s position *when walking on the stair* and is that line which the inside foot follows when *walking on a stair* and therefore this proposal states that the walk line shall be established based only on that portion of the treads in a flight that can be walked on. Any portion of a tread that cannot be walked on does not require regulation by this section. The extension of the tread or its size beyond the “walkable” area, whether for structural attachment or decorative purpose, is not necessary to the regulation of tread depth for the safety of the user.

Ease of enforcement:

In this proposal the location of the walk line is simply determined by measuring onto the tread at the front of each tread from the point of minimum tread depth because the walk line is defined as being parallel to the side of the flight. This represents no change in the common practice to measure at the leading edge or nosing of the tread and no longer will require a square across the tread depth to accurately determine the winder tread depth at the walk line.

Simplification of the IBC Tread Related Sections:

No changes in any of the specified dimensions are being made. The first change is to only move the tread depth requirement to allow the riser requirements to appear together. The word “rectangular” used in exception 2 of the dimensional uniformity exception has been added to clarify. The way in which the winder treads will be measured is changed to match the way they are laid out to be uniform. This does not affect typical two or three winder layouts that are typically much deeper than the rectangular treads they are paired with in a flight and more closely reflects the foot positions in both ascent and descent as a person turns while walking on the stair. At the same time this allows for an easier method of accurately measuring the tread depth without the use of a square across the depth of the winder tread. The minimum winder tread depth is now clarified by reflecting the most common enforcement convention and is to be measured on that portion of the stair-walking surface that is actually used for walking as is in the new walk line section.

The Dimensional uniformity section has been edited for simplification because these terms are now clearly stated in the new walk line section.

PART II-IRC**Need for Improvement:**

Current regulation of the placement of the walk line varies for lack of a specific point from which to measure. The tread depth measured at the walk line therefore varies from one enforcement jurisdiction to another sometimes even within a jurisdiction. The complications of varying interpretations of this part of the code have lead to costly hearings and appeals for variances. The industry needs a standard as do code officials but more importantly the people walking these stairs need a standard as well that will provide consistency in the built environment. In this effort the Stairway Manufacturers’ Association has offered several proposals over the years that have met with an agreement by the committees involved that a standard is needed but with certain objections. Each proposal in succession has improved utilizing the critical direction obtained from the committees in the code development process and in meetings with code officials around the country.

Separate Section on Walk Line is Needed:

The walk line is a critical element of stair design just as are width, headroom, rise and run. The separation of this element draws attention to the need to meet this requirement in the planning stage rather than being buried within the code. This allows for further specifics for location and simplification of the subsequent sections relative to tread depth. Finally although the term walk line has been used for years with in the code text on tread depth, this section offers a clear understanding.

What is the “Walk Line”:

The walk line is related to the person’s position when walking on the stair and is that line which the inside foot follows when walking on a stair and therefore this proposal states that the walk line shall be established based only on that portion of the treads in a flight that can be walked on. Any portion of a tread that cannot be walked on does not require regulation by this section. The extension of the tread or its size beyond the “walkable” area, whether for structural attachment or decorative purpose, is not necessary to the regulation of tread depth for the safety of the user.

Ease of enforcement:

In this proposal the location of the walk line is simply determined by measuring onto the tread at the front of each tread from the point of minimum tread depth because the walk line is defined as being parallel to the side of the flight. This represents no change in the common practice to measure at the leading edge or nosing of the tread and no longer will require a square across the tread depth to accurately determine the winder tread depth at the walk line.

Simplifications of the IRC Tread Related Sections:

No changes in any of the specified dimensions are being made. The way in which the winder treads will be measured is changed to match the way they are laid out to be uniform. This does not affect typical two or three winder layouts that are typically much deeper than the rectangular treads they are paired with in a flight and more closely reflects the foot positions in both ascent and descent as a person turns while walking on the stair. At the same time this allows for an easier method of accurately measuring the tread depth without the use of a square across the depth of the tread winder. The minimum winder tread depth is now clarified by reflecting the most common enforcement convention and is to be measured on that portion of the stair-walking surface that is actually used for walking as is in the new walk line section.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results**PART I – IBC MEANS OF EGRESS****Committee Action:****Disapproved**

Committee Reason: The committee felt that Section 1009.3 for the ‘walk line’ is a definition and would be better placed in Section 1002. The current way to measure the stairs has been used for years and is precise. The proposed language in Section 1009.4 would add ambiguity. The measurements proposed in Section 1009.4 does not specify which angle to which tread, so it is unclear

Assembly Action:**None****PART II – IRC B/E****Committee Action:****Disapproved**

Committee Reason: The proposed language does not improve the current code language for stairways. The committee felt that the definition for walk line should be placed in Section 202. Further, the committee felt the language appeared to be more consistent with commentary rather than code charging text.

Assembly Action:**None**

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted for Part I.

Public Comment:

David W. Cooper, Stair Manufacturing and Design Consulting, representing Stairway Manufacturers Association, requests Approval as Modified by this public comment.

Modify proposal as follows:

1009.3 (IFC [B] 1009.3) Walk line. ~~The walk line is the line of travel used to provide for uniform layout of the tread depths in the design and regulation of flights with winder treads. The walk line shall be parallel to the side of the flight where the treads are narrowest and located 12 inches (305 mm) from the point of minimum tread depth used for placement of the foot on the flight in ascent or descent. The walk line across winder treads shall be concentric to the direction of travel through the turn and located 12 inches (305 mm) from the side where the winders are narrower. The 12 inch (305 mm) dimension shall be measured from the widest point of the clear stair width at the walking surface of the winder. If winders are adjacent within the flight, the point of the widest clear stair width of the adjacent winders shall be used.~~

1009.4 (IFC [B] 1009.4) Stair treads and risers. Stair riser heights shall be 7 inches (178 mm) maximum and 4 inches (102 mm) minimum. The riser height shall be measured vertically between the leading edges of adjacent treads. Rectangular tread depths shall be 11 inches (279 mm) minimum measured horizontally between the vertical planes of the foremost projection of adjacent treads and at a right angle to the tread's leading edge. Winder treads shall have a minimum tread depth of 11 inches (279 mm) measured between the vertical planes of the foremost projection of adjacent treads at the intersections with the walk line and a minimum tread depth ~~used for placement of the foot ascent or descent of~~ 10 inches (254 mm) within the clear width of the stair.

Exceptions:

1. Alternating tread devices in accordance with Section 1009.9.
2. Spiral stairways in accordance with Section 1009.8.
3. Aisle stairs in assembly seating areas where the stair pitch or slope is set, for sightline reasons, by the slope of the adjacent seating area in accordance with Section 1025.11.2.
4. In Group R-3 occupancies; within dwelling units in Group R-2 occupancies; and in Group U occupancies that are accessory to a Group R-3 occupancy or accessory to individual dwelling units in Group R-2 occupancies; the maximum riser height shall be 7.75 inches (197 mm); the minimum tread depth shall be 10 inches (254 mm); the minimum winder tread depth at the walk line shall be 10 inches (254 mm); and the minimum winder tread depth shall be 6 inches (152 mm). A nosing not less than 0.75 inch (19.1 mm) but not more than 1.25 inches (32 mm) shall be provided on stairways with solid risers where the tread depth is less than 11 inches (279 mm).
5. See the Section 3403.4 for the replacement of existing stairways.

Commenter's Reason – Part I: The modification addresses the concerns of all the committees over several cycles of the code of a need to standardize the walk line location at winder treads. The SMA has consistently listened to their feedback for many years in an effort to address the problem. Attempts made to relate the walk line to the handrail or the guard "in fill" at the side of the stair have met with disapproval but further direction from each committee. At the CDH in Palm Springs the IBC committee gave insightful information suggesting that the walk line could be related to the width of the stair. This modification clearly states that relationship and adds further clarity.

The IRC committee had issues with the terminology "used for placement of the foot..." and that has been stricken. The new section titled walk line states clearly and specifically how to locate the walk line at winder treads where it is used to determine the tread depth of winder tread(s) that provide for turning of the stair's direction of travel. This line of travel across winders is a curved path and the walk line established for regulation must parallel it. The term concentric is used because it more accurately describes the geometry of parallel arcs or curves sharing the same center. This separate section substantiates this essential element required in the design and construction of stairs that turn. It further provides clarity for regulating its location that is not subject to the wide interpretation of the present code and thereby allows for the direct reference to walk line in subsequent sections of the code. Please also see the original supporting statement for further substantiation of these changes.

The simple steps to determine compliance are:

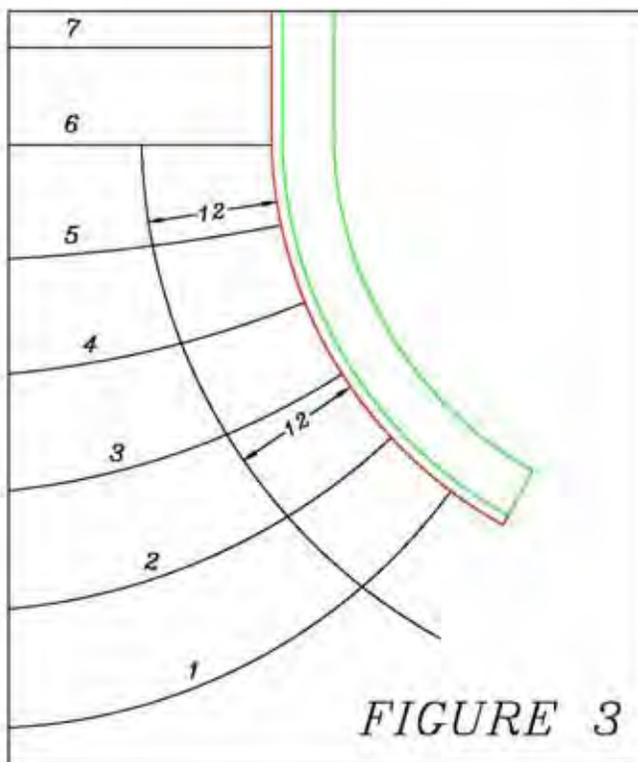
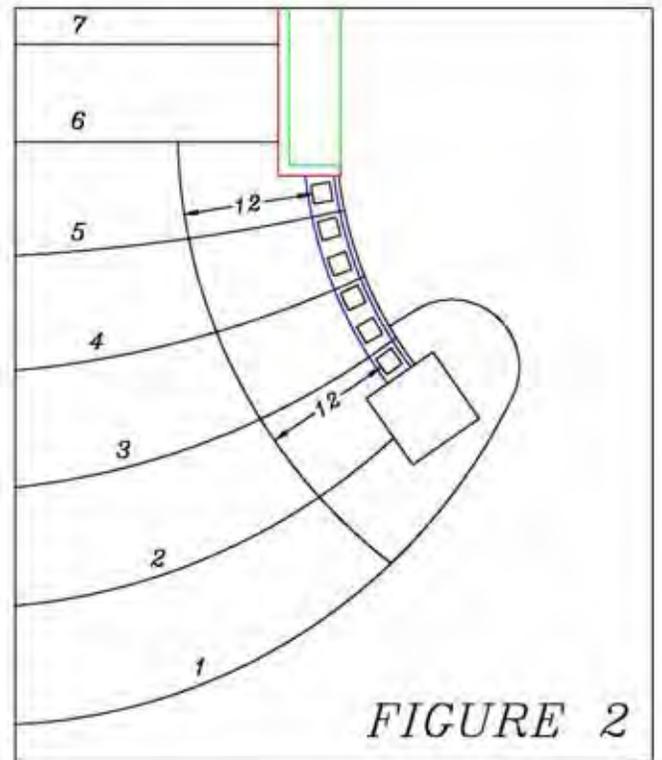
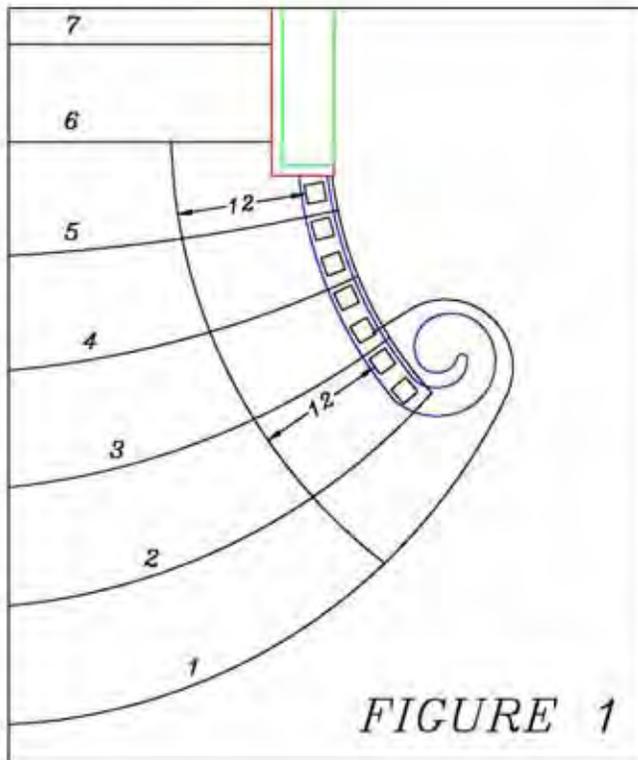
Locate the winder treads in the turn of the stair.

1. Locate the side of the stair where the winder treads are narrower
2. Establish the widest point of clear width of the stair at the surface of the winder or run of adjacent winders
3. Measure across the stair width 12 inches from the object that restricts the clear width at the tread surface
4. Measure tread depth between the intersections of the nosings with the walk line.

Measuring the tread depth at the intersections with the walk line provides for consistent winders that are uniform in depth at the most common path of travel.

The Figures 1, 2 & 3 illustrate common situations in determining the walk line when walls, posts, and balusters/in-fill or combinations of each are located at winder treads. The specification works for any of these situations and assures that the walk line is located as close to the narrow end of the tread as is possible to use. By keeping the walk line closest to the narrow end it assures that the tread is as wide as necessary for safe walking within the width of the stair that is intended and available to use. The 12 inch dimension in the code was determined by measuring the location of a person on a stair while grasping a handrail and is intended to be measured on that portion of the stair that can be used. Portions of winder treads not located within the clear width of the stair do not need to be considered.

For those that wish to offer guidance on complying winder treads at the initial rough inspection it is important to note that this is no more difficult to regulate during the rough stage of inspection than is the width of the stair and probably much easier than regulating the required riser height. In fact the minimum finished clear stair width could easily be determined by marking the place on the rough winder tread where the minimum walk line depth occurs on the rough tread and measuring 12 inches from that location toward the side where the treads are narrower.



Figures 1, 2, & 3 show common walk line locations as determined by the modification. The walk line, balusters, post, and tread nosings are in black. The wall is green and the skirt board or finish stringer is in red.

This item is on the agenda for individual consideration because a public comment was submitted for Part II.

Public Comment:

David W. Cooper, Stair Manufacturing and Design Consulting, representing Stairway Manufacturers Association, requests Approval as Modified by this public comment.

Modify proposal as follows:

R311.5.2.3 Walk line. The walk line is the line of travel used to provide for uniform layout of the tread depths in the design and regulation of flights with winder treads. The walk line shall be parallel to the side of the flight where the treads are narrowest and located 12 inches (305 mm) from the point of minimum tread depth used for placement of the foot on the flight in ascent or descent. The walk line across winder treads shall be concentric to the curved direction of travel through the turn and located 12 inches (305 mm) from the side where the winders are narrower. The 12 inch (305 mm) dimension shall be measured from the widest point of the clear stair width at the walking surface of the winder. If winders are adjacent within the flight, the point of the widest clear stair width of the adjacent winders shall be used.

R311.5.3.2 Tread depth. The minimum tread depth shall be 10 inches (254 mm). The tread depth shall be measured horizontally between the vertical planes of the foremost projection of adjacent treads and at a right angle to the tread's leading edge. The greatest tread depth within any flight of stairs shall not exceed the smallest by more than 3/8 inch (9.5 mm). Winder treads shall have a minimum tread depth of 10 inches (254 mm) measured between the vertical planes of the foremost projection of adjacent treads at the intersections with the walk line. Winder treads shall have a minimum tread depth ~~used for placement of the foot ascent or descent~~ of 6 inches (152 mm) at any point within the clear width of the stair. Within any flight of stairs, the largest winder tread depth at the walk line shall not exceed the smallest winder tread by more than 3/8 inch (9.5 mm).

Commenter's Reason: Same reason as Part I.

Final Hearing Results

E58-07/08, Part I	AMPC
E58-07/08, Part II	AMPC

Code Change No: E60-07/08

Original Proposal

Sections: 1009.3, 1009.3.1 (IFC [B] 1009.3, [B] 1009.3.1); IRC R311.5.3

Proponent: David W. Cooper, Stairway Manufacturers' Association

THESE PROPOSALS ARE ON THE AGENDA OF THE IBC MEANS OF EGRESS AND THE IRC BUILDING/ENERGY CODE DEVELOPMENT COMMITTEES AS 2 SEPARATE CODE CHANGES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IBC MEANS OF EGRESS

1. Add new text as follows:

1009.3 (IFC [B] 1009.3) Stair treads and risers. Stair treads and risers shall comply with Sections 1009.3.1 through 1009.3.5.

1009.3.1 (IFC [B] 1009.3.1) Dimension reference surfaces. For the purpose of the section, all dimensions are exclusive of carpets, rugs, or runners.

2. Revise as follows:

~~**1009.3 (IFC [B] 1009.3) Stair treads and risers**~~ **1009.3.2 (IFC [B] 1009.3.2) Riser height and tread depth.** Stair riser heights shall be 7 inches (178 mm) maximum and 4 inches (102 mm) minimum. Stair tread depths shall be 11 inches (279 mm) minimum. The riser height shall be measured vertically between the leading edges of adjacent

treads. The tread depth shall be measured horizontally between the vertical planes of the foremost projection of adjacent treads and at a right angle to the tread's leading edge. Winder treads shall have a minimum tread depth of 11 inches (279 mm) measured at a right angle to the tread's leading edge at a point 12 inches (305 mm) from the side where the treads are narrower and a minimum tread depth of 10 inches (254 mm).

Exceptions:

1. Alternating tread devices in accordance with Section 1009.9.
2. Spiral stairways in accordance with Section 1009.8.
3. Aisle stairs in assembly seating areas where the stair pitch or slope is set, for sightline reasons, by the slope of the adjacent seating area in accordance with Section 1025.11.2.
4. In Group R-3 occupancies; within dwelling units in Group R-2 occupancies; and in Group U occupancies that are accessory to a Group R-3 occupancy or accessory to individual dwelling units in Group R-2 occupancies; the maximum riser height shall be 7.75 inches (197 mm); the minimum tread depth shall be 10 inches (254 mm); the minimum winder tread depth at the walk line shall be 10 inches (254 mm); and the minimum winder tread depth shall be 6 inches (152 mm). A nosing not less than 0.75 inch (19.1 mm) but not more than 1.25 inches (32 mm) shall be provided on stairways with solid risers where the tread depth is less than 11 inches (279 mm).
5. See the Section 3403.4 for the replacement of existing stairways.

~~1009.3.1 (IFC [B] 1009.3.1)~~ ~~1009.3.3 (IFC [B] 1009.3.3)~~ **Winder treads.** (No change to text)
~~1009.3.2 (IFC [B] 1009.3.2)~~ ~~1009.3.4 (IFC [B] 1009.3.4)~~ **Dimensional uniformity.** (No change to text)
~~1009.3.3 (IFC [B] 1009.3.3)~~ ~~1009.3.5 (IFC [B] 1009.3.5)~~ **(Supp) Profile.** (No change to text)

PART II – IRC BUILDING AND ENERGY

Revise text as follows:

R311.5.3 Stair treads and risers. Stair treads and risers shall meet the requirements of this section. For the purposes of this section all dimensions and dimensioned surfaces shall be exclusive of carpets, rugs, or runners.

Reason: PART I-IBC- This new section provides for accurate measurements consistent with the intent of the code by standardizing the surfaces to be measured from the dimensions currently described under **1009.3 Treads and risers**. It further makes sense out of the nosing radius and bevel dimensions in **1009.3.3 Profile** as these are not intended to be measured at a carpeted surface.

This clarification would result in more consistent interpretation and enforcement eliminating confusion. In our code seminars around the country I ask how officials determine the riser height if the stair is carpeted. Some have a standard thickness they calculate for the carpet without knowing the thickness that will be used. Others measure in consideration of the compressed thickness and still others wait to pass or fail the stairway based on measuring to the uncompressed surface of a carpet that might change after just a few months use or when it is replaced. We can't have our cake and eat it too. Court battles ensue over such widely interpreted issues that become law upon adoption and in this case should become the sole responsibility of the occupant as they change carpets, rugs, and runners.

Surfaces can easily vary 1 inch or more in thickness when uncompressed carpet and pad is inserted in the calculation of the riser height. The code requires accuracy within 3/8 of an inch and yet it provides for inconsistent measurements and enforcement. The fact is that carpeting is not regulated by the code and cannot be indiscriminately inserted based on widely varying individual interpretation.

Whether the stair is site built or prefabricated the rise of the stair is determined during the rough stage long prior to the selection of carpet for thickness. Prior to layout of the stringer you must know what thickness treads will be used and what materials will be used on the floors. The decision is made to allow the landing tread that meets the floor surface (or also called landing nosing) to be held up to accept floor coverings to abut its back edge or place it flush for carpet to wrap it such that the top riser *should always be the same height as the other stair risers within normal construction tolerances prior to the addition of carpets*. The top and bottom steps should not be controlled based on carpet because the uncontrollable addition of rugs and/or runners at the floors and landings will change at the option of the owners/occupants/residents.

Since carpeting is not controlled by the code then the dimensions of the stair should not be controlled by carpet. The code must provide a product that the end user can rely on regardless of the jurisdiction they decide to live or walk. We mislead ourselves if we think that the variants now allowed in measuring the rise on stairs provide for safety. We need to provide a standard the consumer can count on and *walk safely on*.

This change provides the needed standard the code now lacks.

PART II-IRC-This new section provides for accurate measurements consistent with the intent of the code by standardizing the surfaces to be measured from the dimensions described under R311.5.3 Treads and risers. It further makes sense out of the nosing radius and bevel dimensions in R311.5.3.3 Profile as these are not intended to be measured at a carpeted surface.

This clarification would result in more consistent interpretation and enforcement eliminating confusion. In our code seminars around the country I ask how officials determine the riser height if the stair is carpeted. Some have a standard thickness they calculate for the carpet without knowing the thickness that will be used. Others measure in consideration of the compressed thickness and still others wait to pass or fail the stairway based on measuring to the uncompressed surface of a carpet that might change after just a few months use or when it is replaced. We can't have our cake and eat it too. Court battles ensue over such widely interpreted issues that become law upon adoption and in this case should become the sole responsibility of the occupant as they change carpets, rugs, and runners.

Surfaces can easily vary 1 inch or more in thickness when uncompressed carpet and pad is inserted in the calculation of the riser height. The code requires accuracy within 3/8 of an inch and yet it provides for inconsistent measurements and enforcement. The fact is that carpeting is not regulated by the code and cannot be indiscriminately inserted based on widely varying individual interpretation.

Whether the stair is site built or prefabricated the rise of the stair is determined during the rough stage long prior to the selection of carpet for thickness. Prior to layout of the stringer you must know what thickness treads will be used and what materials will be used on the floors. The decision is made to allow the landing tread that meets the floor surface (or also called landing nosing) to be held up to accept floor coverings to abut its back edge or place it flush for carpet to wrap it such that the top riser should always be the same height as the other stair risers within normal construction tolerances prior to the addition of carpets. The top and bottom steps should not be controlled based on carpet because the uncontrollable addition of rugs and/or runners at the floors and landings will change at the option of the residents.

Since carpeting is not controlled by the code then the dimensions of the stair should not be controlled by carpet. The code must provide a product that the end user can rely on regardless of the jurisdiction they decide to live or walk. We mislead ourselves if we think that the variants now allowed in measuring the rise on stairs provide for safety. We need to provide a standard the consumer can count on and walk safely on. This change provides the needed standard the code now lacks.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

PART I – IBC MEANS OF EGRESS
Committee Action:

Disapproved

Committee Reason: The allowance to measure riser and tread depth without consideration of the carpeting could result in stairs that exceed the tolerances between the adjoining risers and treads.

Assembly Action:

None

PART II – IRC-B/E
Committee Action:

Approved as Submitted

Committee Reason: The proposed language provides for accurate measurements of the stair tread and riser profiles. Further, establishing that all dimensions and surfaces are measured exclusive of carpets, rugs or runners gives the building official a clear place to measure to.

Assembly Action:

None

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted for Part I.

Public Comment:

David W. Cooper, Stair Manufacturing and Design Consulting, representing Stairway Manufacturing Association, requests Approval as Submitted.

Commenter's Reason: This issue was approved by the IRC and deserves consideration in the IBC Final Action hearing. Measuring to carpet that does not exist or is subject to changes made by occupants including the addition of mud and water absorbing carpets so commonly used in public spaces provides no level of additional safety and/or can not be regulated. Providing reference surfaces that are standardized will provide consistency through out the built environment.

Final Hearing Results

E60-07/08, Part I	AS
E60-07/08, Part II	AS

Code Change No: E62-07/08

Original Proposal

Sections: 1009.3 (IFC [B] 1009.3)

Proponent: A. Brooks Ballard, Virginia Department of Corrections

Revise as follows:

1009.3 (IFC [B] 1009.3) Stair treads and risers. Stair riser heights shall be 7 inches (178 mm) maximum and 4 inches (102 mm) minimum. Stair tread depths shall be 11 inches (279 mm) minimum. The riser height shall be measured vertically between the leading edges of adjacent treads. The tread depth shall be measured horizontally

between the vertical planes of the foremost projection of adjacent treads and at a right angle to the tread's leading edge. Winder treads shall have a minimum tread depth of 11 inches (279 mm) measured at a right angle to the tread's leading edge at a point 12 inches (305 mm) from the side where the treads are narrower and a minimum tread depth of 10 inches (254 mm).

Exceptions:

1. Alternating tread devices in accordance with Section 1009.9.
2. Spiral stairways in accordance with Section 1009.8.
3. Aisle stairs in assembly seating areas where the stair pitch or slope is set, for sightline reasons, by the slope of the adjacent seating area in accordance with Section 1025.11.2.
4. In Group R-3 occupancies; within dwelling units in Group R-2 occupancies; and in Group U occupancies that are accessory to a Group R-3 occupancy or accessory to individual dwelling units in Group R-2 occupancies; the maximum riser height shall be 7.75 inches (197 mm); the minimum tread depth shall be 10 inches (254 mm); the minimum winder tread depth at the walk line shall be 10 inches (254 mm); and the minimum winder tread depth shall be 6 inches (152 mm). A nosing not less than 0.75 inch (19.1 mm) but not more than 1.25 inches (32 mm) shall be provided on stairways with solid risers where the tread depth is less than 11 inches (279 mm).
5. See the Section 3403.4 for the replacement of existing stairways.
6. In Group I-3 facilities, stairways providing access to guard towers, observations stations and control rooms, not more than 250 square feet (23 m²) in area, shall be permitted to have a maximum riser height of 8 inches (203 mm) and a minimum tread depth of 9 inches (229 mm).

Reason: The proposed new Exception 6, applicable to Use Group I-3, allows spaces that are normally occupied by a small number of staff persons to have stairways with greater riser height and narrower tread depth than the standard 7-11 risers/tread requirements. In order to provide the 360-degree visibility and maximum mobility necessary for guard observation stations, the size of the base of such elevated stations must be kept to a minimum. Security is increased without risk to either the general public or the inmates, since access to these spaces is restricted to prison staff personnel.

This incorporates an allowance found in 1996 BOCA Building Code Section 1014.6

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The exception for Group I-3 is in recognition of the unique environment – limited occupant load with people familiar with the space. The code already allows for alternating tread devices. The proposal would allow for a safer means of access and egress.

Assembly Action:

None

Final Hearing Results

E62-07/08

AS

Code Change No: E64-07/08

Original Proposal

Sections: 1009.3.3 (IFC [B] 1009.3.3)

Proponent: David W. Cooper, Stairway Manufacturers' Association

Revise as follows:

1009.3.3 (IFC [B] 1009.3.3) (Supp) Profile. The radius of curvature at the leading edge of the tread shall be not greater than ~~0.5 inch (12.7 mm)~~ 9/16 inch (14.3 mm). Beveling of nosings shall not exceed 0.5 inch (12.7 mm). Risers shall be solid and vertical or sloped under the tread above from the underside of the ~~leading edge of the tread~~

nosing above at an angle not more than 30 degrees (0.52 rad) from the vertical. The leading edge (nosings) of treads shall project not more than 1.25 inches (32 mm) beyond the tread below and all projections of the leading edges shall be of uniform size, including the leading edge of the floor at the top of a flight.

Exceptions:

1. Solid risers are not required for stairways that are not required to comply with Section 1007.3, provided that the opening between treads does not permit the passage of a sphere with a diameter of 4 inches (102 mm).
2. Solid risers are not required for occupancies in Group I-3 or in F, H and S occupancies other than areas accessible to the public.

Reason: Risers are allowed to slope to provide for nosing projection and necessary heel clearance in descent. The present language does not control the direction in which the riser is allowed to slope. The insertion of the words “under the tread above” provides the clarification needed.

The substitution of the word nosing provides a sentence that is easier to read and understand. The term nosing is a defined term in the code and is further clarified by its use in parenthesis within the text of this section.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The 9/16” dimension recognizes actual construction with a full half round on the front of the tread on a stairway. The proposal recognizes a safety issue that needed to be addressed for riser slope.

Assembly Action:

None

Final Hearing Results

E64-07/08

AS

Code Change No: E66-07/08

Original Proposal

Sections: 1009.3.3 (IFC [B] 1009.3.3)

Proponent: A. Brooks Ballard, Virginia Department of Corrections

Revise as follows:

1009.3.3 (IFC [B] 1009.3.3) (Supp) Profile. The radius of curvature at the leading edge of the tread shall be not greater than 0.5 inch (12.7 mm). Beveling of nosings shall not exceed 0.5 inch (12.7 mm). Risers shall be solid and vertical or sloped from the underside of the leading edge of the tread above at an angle not more than 30 degrees (0.52 rad) from the vertical. The leading edge (nosings) of treads shall project not more than 1.25 inches (32 mm) beyond the tread below and all projections of the leading edges shall be of uniform size, including the leading edge of the floor at the top of a flight.

Exceptions:

1. Solid risers are not required for stairways that are not required to comply with Section 1007.3, provided that the opening between treads does not permit the passage of a sphere with a diameter of 4 inches (102 mm).
2. Solid risers are not required for occupancies in Group I-3 or in F, H and S occupancies other than areas accessible to the public. There are no restrictions on the size of the opening in the riser.

Reason: The additional language is needed for clarification that there are no limits on openings in risers in these unique situations. Exception 2 recognizes that open risers are commonly used for stairs in occupancies such as detention facilities for practical reasons. Open risers provide a greater degree of security and supervision due to the fact that people cannot effectively conceal themselves behind the stair. There is no opening size limitation. These risers can be completely open with no restrictions.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The proposal is appropriate for Group I-3 for areas where direct line of site is important for security reasons.

Assembly Action:

None

Final Hearing Results

E66-07/08

AS

Code Change No: E67-07/08

Original Proposal

Sections: 1009.3.3 (IFC [B] 1009.3.3)

Proponent: Scott Crossfield, Theatre Projects Consultants, Inc., representing himself

Revise as follows:

1009.3.3 (IFC [B] 1009.3.3) (Supp) Profile. The radius of curvature at the leading edge of the tread shall be not greater than 0.5 inch (12.7 mm). Beveling of nosings shall not exceed 0.5 inch (12.7 mm). Risers shall be solid and vertical or sloped from the underside of the leading edge of the tread above at an angle not more than 30 degrees (0.52 rad) from the vertical. The leading edge (nosings) of treads shall project not more than 1.25 inches (32 mm) beyond the tread below and all projections of the leading edges shall be of uniform size, including the leading edge of the floor at the top of a flight.

Exceptions:

1. Solid risers are not required for stairways that are not required to comply with Section 1007.3, provided that the opening between treads does not permit the passage of a sphere with a diameter of 4 inches (102 mm).
2. Solid risers are not required for occupancies in Group I-3 or in F, H and S occupancies other than areas accessible to the public.
3. Solid risers are not required for spiral stairways constructed in accordance with Section 1009.8.
4. Solid risers are not required for alternating tread devices constructed in accordance with Section 1009.9.

Reason: The general requirements for solid risers, as currently stated, are applicable to all stairways. Spiral stairways and alternating tread devices are only used for limited access areas, such as catwalks in theaters, or roof access for maintenance and service personnel. Open risers are necessary for these types of stairways to be constructed safely and efficiently. Sections 1009.8 for spiral stairways and Section 1009.9.2 for alternating tread device do provide specifics for tread and riser dimensions, but do not state if open risers are permitted.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The allowance for open risers on spiral and alternating tread devices is appropriate for safe construction and current practice for these types of stairways.

Assembly Action:

None

Final Hearing Results

E67-07/08

AS

Code Change No: E68-07/08

Original Proposal

Sections: 1009.6 (IFC [B] 1009.6)

Proponent: Robert Bagnetto, Lapeyre Stair Inc.

Revise as follows:

1009.6 (IFC [B] 1009.6) Vertical rise. A flight of stairs shall not have a vertical rise greater than 12 feet (3658 mm) between floor levels or landings.

Exceptions:

1. Aisle stairs complying with Section 1025.
2. Alternating tread devices used as a means of egress shall not have a rise greater than 20 feet (6096mm) between floor levels or landings.

Reason: The purpose of this proposed change to IBC-2006 is to allow a maximum allowable vertical height of 20 feet for alternating tread devices used as a means of egress, without requiring an intermediate landing or platform.

The proposed change is superior to the current provisions of the code in that alternating tread devices may be used in heights up to 20 ft, without the use of an intermediate landing platform. In some instances this eliminates the need for unnecessary components; and potentially improves safety by allowing alternating tread devices to be used in areas with limited horizontal space, where otherwise the only alternative would be to use a vertical ladder.

Alternating tread devices are allowed by the code only as a means of egress to locations that are for use by maintenance/industrial workers (see listing below). Such workers are typically able to climb higher vertical distances than the general public without an intermediate landing. Sections 502 and 505 allow the use of a ladder to access equipment platforms which are also typically used by maintenance/industrial workers. Allowable heights for ladders are not addressed in IBC. OSHA regulations in 29CFR1910.27 allow ladders with cages, wells or safety devices up to 30 feet in height before a landing is required; Ladders without cages, wells or safety devices are allowed up to 20 feet in height before a landing is required. IMC section 306.5 allows ladders up to 30 feet in height without a landing. Alternating tread devices are typically not equipped with cages, wells or safety devices; however they are typically safer than a ladder as they have a larger landing area for the users' feet, side rails that act as a guard and a handrail and a shallower angle. Additionally, alternating tread devices have been shown by approximately 25 years of successful use and by the scientific study, "Performance, perceived safety and comfort of the alternating tread stair" to be an acceptable vertical access component and preferred over ships' ladders. Therefore, allowing alternating tread devices with vertical heights of 20 feet (the same vertical distance as ladders without cages, wells or safety devices) without requiring a landing is reasonable.

Allowed Alternating Tread Devices usage as a Means of Egress

410.5.3	<i>Gridirons of Stage Exits to scuttle in roof</i>
1009.9	<i>Mezzanines $\leq 250 \text{ ft}^2$ & ≤ 5 occupants in F, H & S occupancies</i>
1009.10	<i>I-3 guard towers observation stations or control rooms $\leq 250 \text{ ft}^2$</i>
1009.9.11	<i>to Unoccupied roofs</i>
1015.3	<i>Secondary means of egress to Boiler, Incinerator and Furnace rooms</i>
1015.4	<i>Secondary means of egress to Refrigeration machinery rooms</i>
1015.6.1	<i>Stage galleries, gridirons and catwalks</i>
1019.1.2	<i>Second means of egress for helistops < 60 ft long or 2,000 ft^2 in area</i>

Bibliography:

Performance, perceived safety and comfort of the alternating tread stair by Jorna, Mohageg & Synder, Virginia Polytechnic Institute and State University, published Applied Ergonomics 1989.20.1,26-32
29CFR1910.27(d)(2) Fixed ladders – landing platforms

Cost Impact: The code change proposal could minimally reduce the cost of construction in some cases by eliminating the need for landings for alternating tread devices.

Analysis: There is a similar code change by Mr. Bagnetto to Section 505.5.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: An alternating tread device is not a stairway, so it should be allowed the same as a ladder. Since this is not a stairway, a landing is not required at any height, so the additional exception would provide that clarification.

Assembly Action:

None

Final Hearing Results

E68-07/08

AS

Code Change No: **E72-07/08**

Original Proposal

Sections: 1009.9.2 (IFC [B] 1009.9.2)

Proponent: Robert Bagnetto, Lapeyre Stairs Inc.

Revise as follows:

1009.9.2 (IFC [B] 1009.9.2) Treads of alternating tread devices. Alternating tread devices shall have a minimum projected tread of 5 inches (127 mm), a minimum tread depth of 8.5 inches (216 mm), a minimum tread width of 7 inches (178 mm) and a maximum riser height of 9.5 inches (241 mm). The projected tread depth shall be measured horizontally between the vertical planes of the foremost projections of adjacent treads. The riser height shall be measured vertically between the leading edges of adjacent treads. The combination of riser height and projected tread depth provided shall result in an alternating tread device angle that complies with Section 1002. The initial tread of the device shall begin at the same elevation as the platform, landing or floor surface.

Exception: Alternating tread devices used as an element of a means of egress in buildings from a mezzanine area not more than 250 square feet (23 m²) in area which serves not more than five occupants shall have a minimum projected tread of 8.5 inches (216 mm) with a minimum tread depth of 10.5 inches (267 mm). The rise to the next alternating tread surface should not be more than 8 inches (203 mm).

Reason: The purpose of this proposed change is to clarify the code. The code is ambiguous in that it does not specify how to measure riser height and projected tread depth of alternating tread devices.

This proposal is superior to the current provisions in the code in that it rectifies shortcomings in the code by clarifying the manner in which alternating tread device projected tread depth and riser height are measured.

IBC Section 1009.3 provides details on how to measure riser height and projected tread depth of traditional stairs. However, exception 1 of this section exempts alternating tread devices from measuring riser height and projected tread depth using the same method as for traditional stairs.

IBC section 1009.9.2 provides the values for minimum projected tread depth and maximum riser height but does not provide the details on how to measure these features.

IBC section 1002 defines alternating tread devices as having a series of steps between 50 and 70 degrees.

By definition, the left and right treads of alternating tread devices are each about ½ the width of the device and therefore do not overlap one another. The most reasonable method of measuring projected tread depth of alternating tread devices is using treads that are directly above and below each other (not adjacent treads which are to the side of each other and do not overlap one another.), as these are the treads that the left and right feet of the user each separately use.

Also, measuring both projected tread depth and riser height from adjacent treads would give maximum angles of 43.26 degrees for alternating tread devices accessing mezzanines and 62.24 degrees for alternating tread devices accessing any other area. This would conflict with section 1002 as the maximum angle of 43.26 degrees would be below the minimum 50 degree allowed by definition in section 1002; and the maximum angle of 62.24 degrees would be significantly more restrictive than the 70 degree angle allowed by section 1002. Measuring projected tread depth and riser height in accordance with this proposal would result in maximum angles of 62.02 degrees for alternating tread devices accessing mezzanines and 75.26 degrees for alternating tread devices accessing other areas. These angles are in the range of 50 to 70 degrees as required by the definition of alternating tread devices in section 1002 (with the exception that either the actual projected tread depth used must be larger than the minimum or the actual riser height used must be below the maximum to ensure a maximum angle of 70 degrees).

Note: The current wording in section 1009.9.2 is almost exactly the same as in section 1014.6.6 of the 1996 and 1999 editions the BOCA National Building Code. The history behind how the wording was incorporated into BOCA could not be ascertained.

Bibliography:

Standard Building Code; Section 1007.8.4
The BOCA National Building Code/1999 Sections 1014.6.6

Cost Impact: The code change proposal will not affect the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The proposed language would provide a controlled way to measure treads and risers in alternating tread devices.

Assembly Action:

None

Final Hearing Results

E72-07/08

AS

Code Change No: E74-07/08

Original Proposal

Sections: 408.3.4 (New), 1009.10 (New), 1009.3, 1012.2, 1012.5, 1013.2, 1013.5 (IFC [B] 1009.10 (New), [B] 1009.3, [B] 1012.2, [B] 1012.5, [B] 1013.2, [B] 1013.5)

Proponent: A. Brooks Ballard, Virginia Department of Corrections

1. Add new text as follows:

1009.10 (IFC [B] 1009.10) Ships Ladders. Ships ladders are permitted to be used as a component of a means of egress to and from control rooms or elevated facility observation stations not more than 250 SF (23sq m) with not more than 3 occupants and for access to unoccupied roofs.

Ships ladders shall have a minimum projected tread of 5 inches (127 mm), a minimum tread depth of 8.5 inches (216 mm), a minimum tread width of 15 inches (612 mm) and a maximum riser height of 9.5 inches (241 mm).

Handrails shall be provided on both sides of ships ladders.

(Renumber subsequent sections)

408.3.4 Ship ladders. Ship ladders shall be permitted for egress from control rooms or elevated facility observation rooms in accordance with Section 1009.10.

(Renumber subsequent sections)

2. Revise text as follows:

1009.3 (IFC [B] 1009.3) Stair treads and risers. Stair riser heights shall be 7 inches (178 mm) maximum and 4 inches (102 mm) minimum. Stair tread depths shall be 11 inches (279 mm) minimum. The riser height shall be measured vertically between the leading edges of adjacent treads. The tread depth shall be measured horizontally between the vertical planes of the foremost projection of adjacent treads and at a right angle to the tread's leading edge. Winder treads shall have a minimum tread depth of 11 inches (279 mm) measured at a right angle to the tread's leading edge at a point 12 inches (305 mm) from the side where the treads are narrower and a minimum tread depth of 10 inches (254 mm).

Exceptions:

1. Alternating tread devices in accordance with Section 1009.9.
2. Ships ladders in accordance with Section 1009.10.
2. 3. Spiral stairways in accordance with Section 1009.8.

3. 4. Aisle stairs in assembly seating areas where the stair pitch or slope is set, for sightline reasons, by the slope of the adjacent seating area in accordance with Section 1025.11.2.
4. 5. In Group R-3 occupancies; within dwelling units in Group R-2 occupancies; and in Group U occupancies that are accessory to a Group R-3 occupancy or accessory to individual dwelling units in Group R-2 occupancies; the maximum riser height shall be 7.75 inches (197 mm); the minimum tread depth shall be 10 inches (254 mm); the minimum winder tread depth at the walk line shall be 10 inches (254 mm); and the minimum winder tread depth shall be 6 inches (152 mm). A nosing not less than 0.75 inch (19.1 mm) but not more than 1.25 inches (32 mm) shall be provided on stairways with solid risers where the tread depth is less than 11 inches (279 mm).
5. 6. See the Section 3403.4 for the replacement of existing stairways.

1012.2 (IFC [B] 1012.2) Height. Handrail height, measured above stair tread nosings, or finish surface of ramp slope, shall be uniform, not less than 34 inches (864 mm) and not more than 38 inches (965 mm). Handrail height of alternating tread devices and ship ladders, measured above tread nosings shall be uniform, not less than 30 inches (762 mm) and not more than 34 inches (864 mm).

1012.5 (IFC [B] 1012.5) Handrail extensions. Handrails shall return to a wall, guard or the walking surface or shall be continuous to the handrail of an adjacent stair flight. Where handrails are not continuous between flights the handrails shall extend horizontally at least 12 inches (305 mm) beyond the top riser and continue to slope for the depth of one tread beyond the bottom riser. At ramps where handrails are not continuous between runs, the handrail shall extend horizontally above the landing 12 inches (305 mm) minimum beyond the top and bottom of ramp runs.

Exceptions:

1. Handrails within a dwelling unit that is not required to be accessible need extend only from the top riser to the bottom riser.
2. Aisle handrails in Group A and E occupancies in accordance with Section 1025.13.
3. Handrails for alternating tread devices and ship ladders are permitted to terminate at a location vertically above the top and bottom risers. Handrails for alternating tread devices and ship ladders are not required to be continuous between flights or to extend beyond the top or bottom risers.

1013.2 (IFC [B] 1013.2) Height. Guards shall form a protective barrier not less than 42 inches (1067 mm) high, measured vertically above the leading edge of the tread, adjacent walking surface or adjacent seatboard.

Exceptions:

1. For occupancies in Group R-3, and within individual dwelling units in occupancies in Group R-2, guards whose top rail also serves as a handrail shall have a height not less than 34 inches (864 mm) and not more than 38 inches (1067 mm) measured vertically from the leading edge of the stair tread nosing.
2. The height in assembly seating areas shall be in accordance with section 1024.14.
3. Along alternating tread device and ship ladders, guards whose top rail also serves as a handrail, shall have height not less than 30 inches (762 mm) and not more than 34 inches (864 mm), measured vertically from the leading edge of the device tread nosing.

1013.3 (IFC [B] 1013.3) Opening limitations. Open guards shall have balusters or ornamental patterns such that a 4-inch-diameter (102 mm) sphere cannot pass through any opening up to a height of 34 inches (864 mm). From a height of 34 inches (864 mm) to 42 inches (1067 mm) above the adjacent walking surfaces, a sphere 8 inches (203 mm) in diameter shall not pass.

Exceptions:

1. The triangular openings formed by the riser, tread and bottom rail at the open side of a stairway shall be of a maximum size such that a sphere of 6 inches (152 mm) in diameter cannot pass through the opening.
2. At elevated walking surfaces for access to and use of electrical, mechanical or plumbing systems or equipment, guards shall have balusters or be of solid materials such that a sphere with a diameter of 21 inches (533 mm) cannot pass through any opening.
3. In areas that are not open to the public within occupancies in Group I-3, F, H or S, and for alternating tread devices and ship ladders, balusters, horizontal intermediate rails or other construction shall not permit a sphere with a diameter of 21 inches (533 mm) to pass through any opening.

4. In assembly seating areas, guards at the end of aisles where they terminate at a fascia of boxes, balconies and galleries shall have balusters or ornamental patterns such that a 4-inch-diameter (102 mm) sphere cannot pass through any opening up to a height of 26 inches (660 mm). From a height of 26 inches (660 mm) to 42 inches (1067 mm) above the adjacent walking surfaces, a sphere 8 inches (203 mm) in diameter shall not pass.
5. Within individual dwelling units and sleeping units in Group R-2 and R-3 occupancies, openings for required guards on the sides of stair treads shall not allow a sphere of 4.375 inches (111 mm) to pass through.

Reason: Applicable to Use Group I-3, allows spaces that are normally occupied by a small number of staff persons to have stairways with greater riser height and narrower tread depth than the standard 7-11 riser/tread requirements. In order to provide the 360-degree visibility and maximum mobility necessary for guard observation stations, the size of the base of such elevated stations must be kept to a minimum. Security is increased without risk to either the general public or the inmates, since access to these spaces is restricted to prison staff personnel.

Ships ladders are easier and safer to maneuver than are alternating tread stairs in conditions related to I-3 functions which require carrying items necessary for occupation.

The proposals to Sections 1009.3, 1012.2, 1012.5, 1013.2 and 1013.3 are for correlation. During the 2006/07 cycle the committee approved the revisions in code changes E86, E93, E99 and E100 that added provisions for alternating tread devices to 1012.2, 1012.5, 1013.2 and 1013.3. The same exceptions for handrails and guards should apply to ship ladders.

Cost Impact: The code change will not increase the cost of construction.

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: Ships ladders are undefined terms. This could be misapplied to other locations where this type of access would not be appropriate. This should be limited to Group I-3.

Assembly Action:

None

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because public comments were submitted.

Public Comment 1:

A. Brooks Ballard, Virginia Department of Corrections, requests Approval as Modified by this public comment.

Modify proposal as follows:

1009.10 (IFC [B] 1009.10) Ship Ships ladders. ~~Ship Ships~~ ladders are permitted to be used as a component of a means of egress to and from control rooms or elevated facility observation stations not more than 250 SF (23sq m) with not more than 3 occupants and for access to unoccupied roofs in Group I-3.

~~Ship Ships~~ ladders shall have a minimum projected tread of 5 inches (127 mm), a minimum tread depth of 8.5 inches (216 mm), a minimum tread width of 15 inches (612 mm) and a maximum riser height of 9.5 inches (241 mm).

Handrails shall be provided on both sides of ~~ship ships~~ ladders.

(Renumber subsequent sections)

1009.3 (IFC [B] 1009.3) Stair treads and risers. Stair riser heights shall be 7 inches (178 mm) maximum and 4 inches (102 mm) minimum. Stair tread depths shall be 11 inches (279 mm) minimum. The riser height shall be measured vertically between the leading edges of adjacent treads. The tread depth shall be measured horizontally between the vertical planes of the foremost projection of adjacent treads and at a right angle to the tread's leading edge. Winder treads shall have a minimum tread depth of 11 inches (279 mm) measured at a right angle to the tread's leading edge at a point 12 inches (305 mm) from the side where the treads are narrower and a minimum tread depth of 10 inches (254 mm).

Exceptions:

1. Alternating tread devices in accordance with Section 1009.9.
2. ~~Ship Ships~~ ladders in accordance with Section 1009.10.

(Portions of proposal not shown remain unchanged)

Commenter's Reason: These changes, in response to spring hearing comments, are to remove the inconsistency in the term ship vs ships and clarify the original intent of this being allowed for Group I-3 only. Ship ladders are defined within this change by prescriptive requirements and parameters.

Public Comment 2:

David W. Cooper, Stair Manufacturing and Design Consulting, representing Stairway Manufacturers Association, requests Approval as Modified by this public comment.

Modify proposal as follows:

1009.10 (IFC [B] 1009.10) Ships Ladders. Ships ladders are permitted to be used as a component of a means of egress to and from control rooms or elevated facility observation stations not more than 250 SF (23sq m) with not more than 3 occupants and for access to unoccupied roofs. Ships ladders shall have a minimum ~~projected~~ tread depth of 5 inches (127 mm). ~~The tread shall be projected such that the total of the tread depth plus the nosing projection is no less than 8.5 inches (216 mm), a minimum tread depth of 8.5 inches (216 mm), a minimum tread width of 15 inches (612 mm) and a~~ The maximum riser height shall be of 9.5 inches (241 mm). Handrails shall be provided on both sides of ships ladders. ~~The minimum clear width at and below the handrails shall be 20 inches (508 mm).~~

(Portions of proposal not shown remain unchanged)

Commenter's Reason: This proposal unnecessarily took flawed alternating tread device language and inappropriately applied it to ships ladders. Ships ladders can be easily referenced using the terminology that is used for stairs to allow for ease of understanding by all and provide for consistent enforcement of the code. The clear width of the ladder should be identified as with stairs not the tread width.

Final Hearing Results

E74-07/08

AMPC1, 2

Code Change No: E76-07/08

Original Proposal

Sections: 1009.12 (New), 1009.12.1 (New) (IFC [B] 1009.12 (New), [B] 1009.12.1 (New))

Proponent: Ed Donoghue, Edward Donoghue Associates Inc., representing National Elevator Industry, Inc.

Add new text as follows:

1009.12 (IFC [B] 1009.12) Stairway to elevator equipment. Roofs and penthouses containing elevator equipment that must be accessed for maintenance are required to be accessed by a stairway.

1009.12.1 (IFC [B] 1009.12.1) Penthouse or roof access. Where the stairway provides access to the penthouse or roof, access shall be provided through a penthouse complying with Section 1509.2.

Reason: The requirement for a stair to the roof for maintaining elevator equipment will correlate the IBC with ASME A17.1/CSA B44. ASME A17.1/CSA B44 has required stairs and a door to access elevator equipment since 1955. More specifically Section 2.27.3.2.1 of A17.1 states the following "a stairway with a swinging door and platform at the top level, conforming to 2.7.3.3 shall be provided from the top floor of the building to the roof level. Hatch covers as a means of access to roofs shall not be permitted." Alternating tread devices or ladders are not permitted as alternatives to the starway.

A similar code change was submitted in the last cycle (E71-06/07) to Section 1009.11, which was disapproved as it was felt that the definition of occupiable space already addressed this concern. The definition for occupiable space does not necessarily cover maintenance of elevator equipment as the intent of "engaged in labor" is talking more about the intended occupancy classification of the space such as an office space. The commentary for the definition of occupiable space states "Some spaces are neither habitable nor occupiable, such as closets, toilet rooms and mechanical equipment rooms." Without clarification this section conflicts with the elevator code.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Modified

Modify the proposal as follows:

1009.12 (IFC [B] 1009.12) Stairway to elevator equipment. Roofs and penthouses containing elevator equipment that must be accessed for maintenance are required to be accessed by a stairway.

~~**1009.12.1 (IFC [B] 1009.12.1) Penthouse or roof access.** Where the stairway provides access to the penthouse or roof, access shall be provided through a penthouse complying with Section 1509.2.~~

Committee Reason: The proposed Section 1009.12.1 was deleted because it was unclear if the stairway access to the roof was required to be through a separate roof structure or through the elevator penthouse. In addition, there are hatches that provide safe roof access; therefore a stair penthouse is not needed.

Section 1009.12 was approved to provide coordination with the elevator standard, ASME A17.1.

Assembly Action:

None

Final Hearing Results

E76-07/08

AM

Code Change No: E78-07/08

Original Proposal

Sections: 1011.1 (IFC [B] 1011.1)

Proponent: Keith Wen, RA, New York City Department of Buildings, representing New York City

Revise as follows:

1011.1 (IFC [B] 1011.1) Where required. Exits and exit access doors shall be marked by an approved exit sign readily visible from any direction of egress travel. ~~The path of egress travel~~ Access to exits and within exits shall be marked by readily visible exit signs ~~to clearly indicate the direction of egress travel~~ in cases where the exit or the path of egress travel is not immediately visible to the occupants. Intervening means of egress doors within exits shall be marked by exit signs. Exit sign placement shall be such that no point in an exit access corridor or exit passageway is more than 100 feet (30 480 mm) or the listed viewing distance for the sign, whichever is less, from the nearest visible exit sign.

Exceptions:

1. Exit signs are not required in rooms or areas that require only one exit or exit access.
2. Main exterior exit doors or gates that are obviously and clearly identifiable as exits need not have exit signs where approved by the building official.
3. Exit signs are not required in occupancies in Group U and individual sleeping units or dwelling units in Group R-1, R-2 or R-3.
4. Exit signs are not required in sleeping areas in occupancies in Group I-3.
5. In occupancies in Groups A-4 and A-5, exit signs are not required on the seating side of vomitories or openings into seating areas where exit signs are provided in the concourse that are readily apparent from the vomitories. Egress lighting is provided to identify each vomitory or opening within the seating area in an emergency.

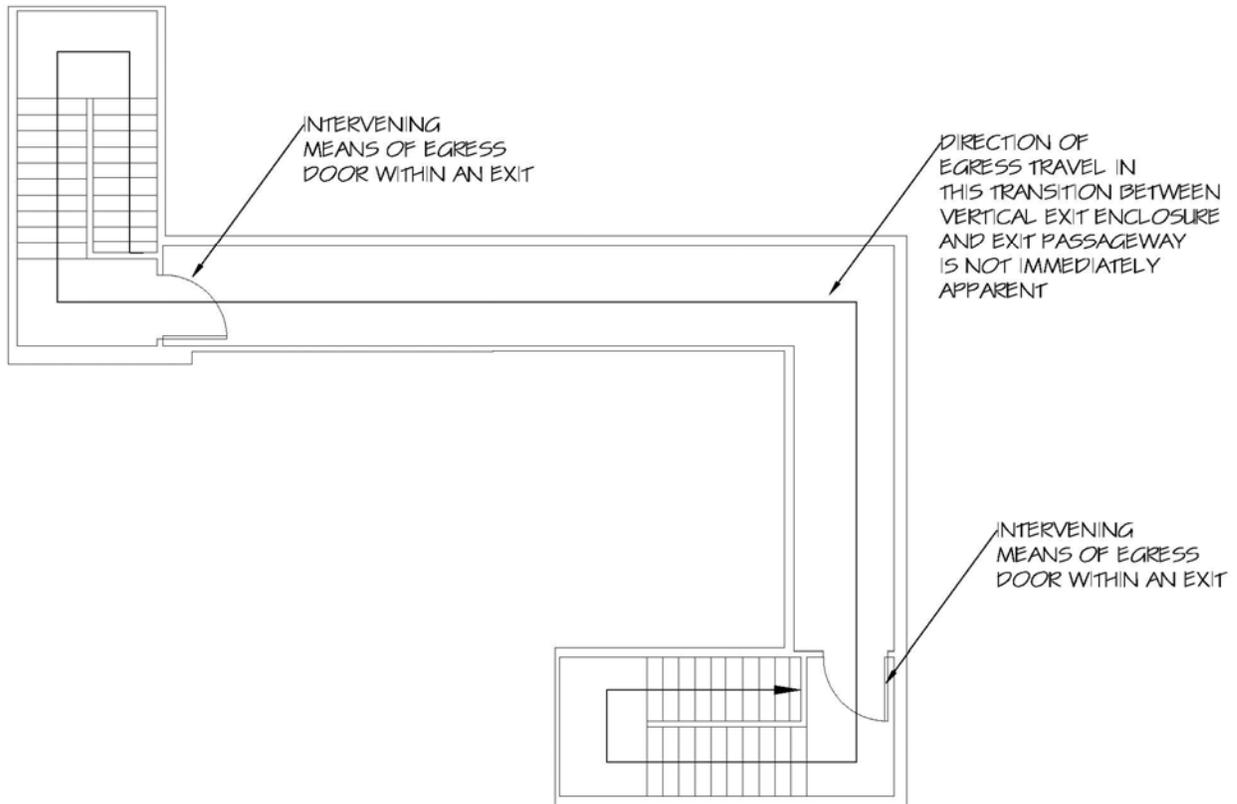
Reason: Section 1011.1 requires exit signs along the exit access to help occupants to reach the exits. Typically, once the occupants reach the exits, exit signs are not required within the exits. However, in buildings with more complicated egress layout, it is possible that the direction of egress travel within the exits may not be immediately apparent to the occupants. For example, a vertical exit enclosure on the north side of a building may transition into a horizontal extension in the form of either an extended landing/corridor or an exit passageway with intervening means of egress doors on the 15th floor or before continuing down into the staircase on the south side. The path of egress might involve turns with extended distances. In such cases, it is important to provide clear egress direction for the occupants within the exits.

The report from the 2003 World Trade Center Building Code Task Force identified the problem of clarity or “readability” of travel within exit enclosures, and in response to the 1993 and 2001 World Trade Center incidents, recommended additional exit signs within the exit enclosures.

Evacuees may be hesitant or even confused when traveling within an exit that involves transition from a vertical to a horizontal direction and horizontal extension that includes turns and intervening doors within the path of egress. When travel direction is not clear within an exit, it creates uncertainty in decision making and causes delays in evacuations in threatening conditions.

The proposed changes clarify that exit signs shall be installed if the path of egress travel within an exit is not obvious to the occupants. This may already be the practice of many jurisdictions to ensure life safety of the occupants; this proposal simply codifies such practice.

Additionally, similar to the requirement for exit access corridor, exit signs in exit passageways should also be visible from within a 100 feet or the listed viewing distance for the sign, whichever is less.



EXAMPLE OF AN EXIT PASSAGEWAY THAT REQUIRES EXIT SIGNS ALONG THE EGRESS PATH AND ON THE INTERVENING EXIT DOORS

Bibliography:

City of New York, Department of Buildings. World Trade Center Building Code Task Force: Findings and Recommendations (available at <http://home2.nyc.gov/html/dob/downloads/pdf/wtcbcf.pdf>). February, 2003.
LL26/2004 Section 27-383.1 (a).

Cost Impact: This proposal establishes requirements for exit signs in exits where egress direction is not immediately apparent, which may increase costs in buildings that have more complicated egress paths, but the decrease in egress and full building evacuation time outweighs the moderate cost of the exit signs.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The additional exit signage is needed for clarity for occupant egress. The proposed language would clarify if exit signs are needed within exit stairways or exit passageways.

Assembly Action:

None

Final Hearing Results

E78-07/08

AS

Code Change No: E79-07/08

Original Proposal

Sections: 1011.1 (IFC [B] 1011.1)

Proponent: A. Brooks Ballard, Virginia Department of Corrections

Revise as follows:

1011.1 (IFC [B] 1011.1) Where required. Exits and exit access doors shall be marked by an approved exit sign readily visible from any direction of egress travel. Access to exits shall be marked by readily visible exit signs in cases where the exit or the path of egress travel is not immediately visible to the occupants. Exit sign placement shall be such that no point in a corridor is more than 100 feet (30 480 mm) or the listed viewing distance for the sign, whichever is less, from the nearest visible exit sign.

Exceptions:

1. Exit signs are not required in rooms or areas that require only one exit or exit access.
2. Main exterior exit doors or gates that are obviously and clearly identifiable as exits need not have exit signs where approved by the building official.
3. Exit signs are not required in occupancies in Group U and individual sleeping units or dwelling units in Group R-1, R-2 or R-3.
4. Exit signs are not required in dayrooms, sleeping areas rooms, or dormitories in occupancies in Group I-3.
5. In occupancies in Groups A-4 and A-5, exit signs are not required on the seating side of vomitories or openings into seating areas where exit signs are provided in the concourse that are readily apparent from the vomitories. Egress lighting is provided to identify each vomitory or opening within the seating area in an emergency.

Reason: This change clarifies the intent of this section that exit signs are not required in cells or contiguous housing dayrooms or sleeping dormitories in Group I-3 occupancies as those areas are within the same smoke compartment and therefore fall under the Group I-3 classification. Most occupants in such buildings are long-time residents who become familiar with the locations of all exits outside their sleeping areas, whether they are marked or unmarked. In cases of emergency, occupants in Use Group I-3 are escorted by staff to the exits and to safety. The exit signs also represent potential for vandalism and use as weapons when they are accessible to the residents.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The proposed language would clarify and coordinate with the fire operation and the safety plans for Group I-3 occupancies. Signage may need to be removed in these areas for security concerns about the signs being used as potential weapons.

Assembly Action:

None

Final Hearing Results

E79-07/08

AS

Code Change No: **E82-07/08**

Original Proposal

Sections: 1012.5 (IFC [B] 1012.5)

Proponent: Philip Brazil, Reid Middleton, Inc., representing himself

Revise as follows:

1012.5 (IFC [B] 1012.5) (Supp) Handrail extensions. Handrails shall return to a wall, guard or the walking surface or shall be continuous to the handrail of an adjacent stair flight. Where handrails are not continuous between flights the handrails shall extend horizontally at least 12 inches (305 mm) beyond the top riser and continue to slope for the depth of one tread beyond the bottom riser. At ramps where handrails are not continuous between runs, the handrail shall extend horizontally above the landing 12 inches (305 mm) minimum beyond the top and bottom of ramp runs. The extensions of handrails shall be in the same direction of the stair flights at stairways and the ramp runs at ramps.

Exceptions:

1. Handrails within a dwelling unit or sleeping unit that is not required to be ~~accessible~~ an Accessible unit or a Type A unit, need extend only from the top riser to the bottom riser.
2. Aisle handrails in Group A and E occupancies in accordance with Section 1025.13.
3. Handrails for alternating tread devices may terminate at a location vertically above the top and bottom risers. Handrails for alternating tread devices are not required to be continuous between flights or to extend beyond the top or bottom risers.

Reason: The question of what direction handrails should extend at the top and bottom of stair flights and ramp runs has existed for many years. I believe public safety is better served when the extensions are in the same direction as the stair flights and ramp runs they serve. The purpose for this proposal is to add language making it clear that the extensions are required to be in the same direction. It will also better align IBC Section 1012.5 with Section 505.10 of ICC A117.1-03, which requires handrails to extend beyond and in the same direction of stair flights and ramp runs.

Exception #1 is revised for consistency with the terminology in IBC Chapter 11 for dwelling units, sleeping units, Accessible units and Type A units. Note that the first two terms are defined in Section 202 and the last two terms are defined in Section 1102.1. Type B units are not also excluded from qualifying for Exception #1 because multistory dwelling units and sleeping units not provided with elevator service are not required to be Type B units. Refer to IBC Section 1107.7.2 for further information.

This proposal began as a public comment to Proposal E92-06/07-D. One of the reasons cited by the Means of Egress Committee for disapproving Proposal E92-06/07 was that there should be an exception where handrails are continuous. The proposed language in this proposal requiring handrail extensions to be in the same direction as stair flights and ramp runs, however, does not apply to continuous handrails because there is no extension at a continuous handrail, only at the ends of handrails. Refer to the 2006 Report of the Public Hearing on the 2006 ICC construction codes for further information.

A second reason cited by the Means of Egress Committee for disapproval was that there should be an exception for Group A aisle situations. Exception #2 to Section 1012.5, however, exempts aisle handrails in Group A and E occupancies in accordance with Section 1025.13. Section 1025.13 on handrails in assembly occupancies, in turn, provides exemptions for ramped aisles and aisle stairs. Handrails are not required at (1) ramped aisles with seating on both sides where the slope of the aisle is no greater than 1:8 and, (2) at the sides of ramped aisles regardless of the seating arrangement where a guard with graspability at least equivalent to that required for a handrail is provided.

A third reason cited by the Means of Egress Committee for disapproval was that the straight extension of the handrail into the landing at the top and bottom of the stairway could be an egress hazard. Section 1012.5, however, currently requires handrails to return to a wall, guard or the walking surface, except for handrails that are continuous to an adjacent stair flight or ramp run. An extension of a handrail is a portion of the handrail and is subject to this same requirement.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Modified

Modify the proposal as follows:

1012.5 (IFC [B] 1012.5) (Supp) Handrail extensions. Handrails shall return to a wall, guard or the walking surface or shall be continuous to the handrail of an adjacent stair flight. Where handrails are not continuous between flights the handrails shall extend horizontally at least 12 inches (305 mm) beyond the top riser and continue to slope for the depth of one tread beyond the bottom riser. At ramps where handrails are not continuous between runs, the handrail shall extend horizontally above the landing 12 inches (305 mm) minimum beyond the top and bottom of ramp runs. The extensions of handrails shall be in the same direction of the stair flights at stairways and the ramp runs at ramps.

Exceptions:

1. Handrails within a dwelling unit ~~or sleeping unit~~ that is not required to be accessible ~~an Accessible unit or a Type A unit~~, need extend only from the top riser to the bottom riser.
2. Aisle handrails in Group A and E occupancies in accordance with Section 1025.13.
3. Handrails for alternating tread devices may terminate at a location vertically above the top and bottom risers. Handrails for alternating tread devices are not required to be continuous between flights or to extend beyond the top or bottom risers.

Committee Reason: The proposal clarifies that the required handrail extension should not bend to maintain safety for persons with mobility impairments as well as the general public. This would coordinate with ICC A117.1 and the ADA/ABA Guidelines. The modification is to maintain the language in Exception 1. The term 'accessible' is broad enough that it will prohibit the exception for the handrail extension in Accessible units, Type A units and Type B units.

Assembly Action:

None

Final Hearing Results

E82-07/08

AM

Code Change No: E85-07/08

Original Proposal

Sections: 1013.1, 1013.1.1 (New), 1013.2, 1013.3, 1013.5, 1013.6 (IFC [B] 1013.1, [B] 1013.1.1 (New), [B] 1013.2, [B] 1013.3, [B] 1013.5, [B] 1013.6); IRC R312.1, R312.2

Proponent: Paul K. Heilstedt, P.E., Chair, representing ICC Code Technology Committee (CTC)

THESE PROPOSALS ARE ON THE AGENDA OF THE IBC MEANS OF EGRESS AND THE IRC BUILDING/ENERGY CODE DEVELOPMENT COMMITTEE AS 2 SEPARATE CODE CHANGES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IBC MEANS OF EGRESS

1. Revise as follows:

**SECTION 1013.0
GUARDS**

1013.1 (IFC [B] 1013.1) (Supp) Where required. Guards shall be located along open-sided walking surfaces, including mezzanines, equipment platforms, stairways, stairs, ramps and landings, that are located more than 30 inches measured vertically to the floor or grade below at any point within 36 inches (914 mm) horizontally to the edge of the open side ~~above the floor or grade below.~~. Guards shall be adequate in strength and attachment in accordance with Section 1607.7. ~~Where glass is used to provide a guard or as a portion of the guard system, the guard shall also comply with Section 2407. Guards shall also be located along glazed sides of stairways, ramps and landings that are located more than 30 inches (762 mm) above the floor or grade below where the glazing provided does not meet the strength and attachment requirements in Section 1607.7.~~

Exception: Guards are not required for the following locations:

1. On the loading side of loading docks or piers.
2. On the audience side of stages and raised platforms, including steps leading up to the stage and raised platforms.
3. On raised stage and platform floor areas such as runways, ramps and side stages used for entertainment or presentations.
4. At vertical openings in the performance area of stages and platforms.
5. At elevated walking surfaces appurtenant to stages and platforms for access to and utilization of special lighting or equipment.
6. Along vehicle service pits not accessible to the public.
7. In assembly seating where guards in accordance with Section 1025.14 are permitted and provided.

2. Add new text as follows:

1013.1.1 (IFC [B] 1013.1.1) Glazing. Where glass is used to provide a guard or as a portion of the guard system, the guard shall also comply with Section 2407. Where the glazing provided does not meet the strength and attachment requirements in Section 1607.7, complying guards shall also be located along glazed sides of open-sided walking surfaces.

3. Revise as follows:

1013.2 (IFC [B] 1013.2) (Supp) Height. ~~Required guards shall form a protective barrier be not less than 42 inches (1067 mm) high, measured vertically above the adjacent walking surfaces, adjacent fixed seating or the line connecting the leading edge edges of the tread treads , adjacent walking surface or adjacent seatboard.~~

Exceptions:

1. ~~For occupancies in Group R-3, and within individual dwelling units in occupancies in Group R-2, guards whose top rail also serves as a handrail shall have a height not less than 34 inches (864 mm) and not more than 38 inches (965 mm) measured vertically from the leading edge of the stair tread nosing. guards on the open sides of stairs shall have a height not less than 34 inches (864 mm) measured vertically from a line connecting the leading edges of the treads.~~
2. ~~For occupancies in Group R-3, and within individual dwelling units in occupancies in Group R-2, where the top of the guard also serves as a handrail on the open sides of stairs, the top of the guard shall not be less than 34 inches (864 mm) and not more than 38 inches (965 mm) measured vertically from a line connecting the leading edges of the treads.~~
- ~~2.~~ 3. The height in assembly seating areas shall be in accordance with Section 1024.14.
- ~~3.~~ 4. Along alternating tread device, guards whose top rail also serves as a handrail, shall have height not less than 30 inches (762 mm) and not more than 34 inches (864 mm), measured vertically from the leading edge of the device tread nosing.

1013.3 (IFC [B] 1013.3) (Supp) Opening limitations. ~~Open Required guards shall have balusters or ornamental patterns such that a not have openings which allow passage of a sphere 4-inch-inches (102 mm) diameter sphere in diameter from the walking surface to the required guard height cannot pass through any opening up to a height of 34 inches (864 mm). From a height of 34 inches (864 mm) to 42 inches (1067 mm) above the adjacent walking surfaces, a sphere 8 inches (203 mm) in diameter shall not pass.~~

Exceptions:

1. ~~From a height of 36 inches (914 mm) to 42 inches (1067 mm), guards shall not have openings which allow passage of a sphere 4.375 inches (111 mm) in diameter.~~
- ~~4.~~ 2. ~~The triangular openings at the open sides of a stair, formed by the riser, tread and bottom rail, at the open side of a stairway shall be of a maximum size such that a sphere of 6 inches (152 mm) in diameter cannot pass through the opening. not allow passage of a sphere 6 inches (152 mm) in diameter.~~
- 2 3. ~~At elevated walking surfaces for access to and use of electrical, mechanical or plumbing systems or equipment, guards shall have balusters or be of solid materials such that a sphere with a diameter of 21 inches (533 mm) cannot pass through any opening. not have openings which allow passage of a sphere 21 inches (533 mm) in diameter.~~
- ~~3.~~ 4. ~~In areas which are not open to the public within occupancies in Group I-3, F, H or S, and for alternating tread devices balusters, horizontal intermediate rails or other construction shall not permit a sphere with a diameter of 21 inches (533 mm) to pass through any opening. guards shall not have openings which allow passage of a sphere 21 inches (533 mm) in diameter.~~
4. 5. ~~In assembly seating areas, guards at the end of aisles where they terminate at a fascia of boxes, balconies and galleries shall have balusters or ornamental patterns such that a not have openings which allow passage of a sphere 4 inch inches (102mm) in diameter sphere cannot pass through any opening up to a height of 26 inches (660 mm). From a height of 26 inches (660 mm) to 42 inches (1067 mm) above the adjacent walking surfaces, guards shall not have openings which allow passage of a sphere 8 inches (203 mm) in diameter shall not pass.~~
- ~~5.~~ 6. ~~Within individual dwelling units and sleeping units in Group R-2 and R-3 occupancies, openings for required guards on the sides of stair treads shall not allow a sphere of 4.375 inches (111 mm) to pass through. guards on the open sides of stairs shall not have openings which allow passage of a sphere 4.375 (111 mm) inches in diameter.~~

1013.4. (IFC [B] 1013.4) Screen porches. (No change to current text)

1013.5 (IFC [B] 1013.5) Mechanical equipment. Guards shall be provided where appliances, equipment, fans, roof hatch openings or other components that require service are located within 10 feet (3048 mm) of a roof edge or open side of a walking surface and such edge or open side is located more than 30 inches (762 mm) above the floor, roof or grade below. The guard shall be constructed so as to prevent the passage of a sphere 21 inch inches (533 mm) in diameter sphere. The guard shall extend not less than 30 inches (762 mm) beyond each end of such appliance, equipment, fan or component.

1013.6 (IFC [B] 1013.6) Roof access. Guards shall be provided where the roof hatch opening is located within 10 feet (3048 mm) of a roof edge or open side of a walking surface and such edge or open side is located more than 30 inches (762 mm) above the floor, roof or grade below. The guard shall be constructed so as to prevent the passage of a sphere 21 inch inches (533 mm) in diameter sphere.

PART II – IRC BUILDING AND ENERGY

1. Revise as follows:

SECTION R312 GUARDS

R312.1 (Supp) Where Guards required. ~~Guards shall be provided on all decks, landings, porches, balconies, ramps or raised floor surfaces located more than 30 inches (762 mm) above the floor or grade below. Required guards shall not be less than 36 inches in height. Open sides of stairs with a total rise of more than 30 inches (762 mm) above the floor or grade below shall have guards not less than 34 inches (864 mm) in height measured vertically from the nosing of the treads. Guards shall be located along open-sided walking surfaces, including stairs, ramps and landings, that are located more than 30 inches measured vertically to the floor or grade below at any point within 36 inches (914 mm) horizontally to the edge of the open side. Insect screening shall not be considered as a guard.~~

~~Porches and decks which are enclosed with insect screening shall be equipped with guards where the walking surface is located more than 30 inches (762 mm) above the floor or grade below.~~

2. Add new text as follows:

R312.2 Height. Required guards at open-sided walking surfaces, including stairs, porches, balconies or landings, shall be not less than 36 inches (914 mm) high measured vertically above the adjacent walking surface, adjacent fixed seating or the line connecting the leading edges of the treads.

Exceptions:

1. Guards on the open sides of stairs shall have a height not less than 34 inches (864 mm) measured vertically from a line connecting the leading edges of the treads.
2. Where the top of the guard also serves as a handrail on the open sides of stairs, the top of the guard shall not be not less than 34 inches (864 mm) and not more than 38 inches (965 mm) measured vertically from a line connecting the leading edges of the treads.

3. Revise as follows:

~~**R312.2 R312.3 Guard Opening limitations.** Required guards on open sides of stairways, raised floor areas, balconies and porches shall not have openings intermediate rails or ornamental closures which do not allow passage of a sphere 4 inches (102 mm) or more in diameter from the walking surface to the required guard height.~~

Exceptions:

1. The triangular openings at the open side of a stair, formed by the riser, tread and bottom rail of a guard, at the open side of a stairway shall be permitted to be of such a size that a sphere 6 inches cannot pass through. not allow passage of a sphere 6 inches (153 mm) in diameter.
2. Openings for required guards on the open sides of stair treads stairs shall not allow passage of a sphere 43/8 inches or more in diameter to pass through. Guards on the open sides of stairs shall not have openings which allow passage of a sphere 4.375 inches (111 mm) in diameter

Reason: The ICC Board established the ICC Code Technology Committee (CTC) as the venue to discuss contemporary code issues in a committee setting which provides the necessary time and flexibility to allow for full participation and input by any interested party. The code issues are assigned to the CTC by the ICC Board as "areas of study". Information on the CTC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CTC effort can be downloaded from the following website: <http://www.iccsafe.org/cs/cc/ctc/index.html>. Since its inception in April/2005, the CTC has held twelve meetings - all open to the public.

This proposed change is a result of the CTC's investigation of the area of study entitled "Climbable Guards". The scope of the activity is noted as:

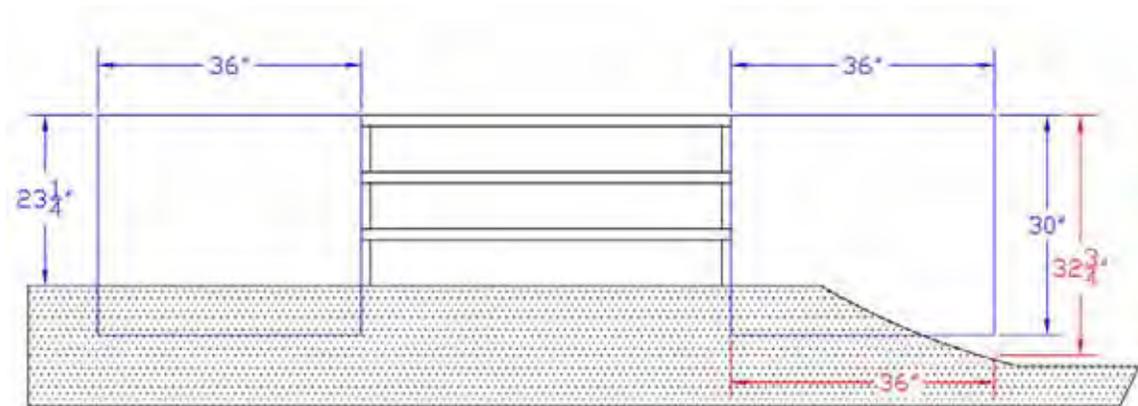
The study of climbable guards will focus on determining the need for appropriate measures to prevent or inhibit an individual from utilizing the elements of a guard system, including rails, balusters and ornamental patterns, to climb the guard, thereby subjecting that person to the falling hazard which the guard system is intended to prevent.

This proposal is a follow-up to E96 – 06/07. As of this writing this area of study has been completed by the CTC relative to these proposals. The general focus of these two proposals, one to the IBC and one to the IRC, is to create consistency in language regulating guards in the two codes.

Part I – IBC

IBC 1013.1. Laundry lists of items in the code are typically not all-inclusive. The word "including" provides this clarification in the following sections as well. This section is divided into two paragraphs with the second paragraph dealing with glass and glazing without a change in intent.

The key part of this change to IBC 1013.1 is submitted in order to clarify how the height measurement which triggers the guard requirement is made relative to the adjacent fall-off. This is illustrated in the following figure:



The view is taken from the landing of a 3 riser stair, looking towards the face of the risers.



IBC 1013.2: The technical portions of this change are the changes that stipulates that the provisions are applicable to only required guards and that a fixed seat becomes a potential walking surface to a child and thus warrants the guard height to be measured from that point. The remainder does not change the intent but rather provides standardized text dealing with stair treads and the determination of how to measure guard height. This public comment revises the term to "fixed seating" so as to clarify the measurement, using common terminology. Fixed seating represents a walking surface that is sure to be utilized by children. As such, the measurement of the guard must be taken from this location to address the hazard of a child falling over the guard. It is impossible for the code to regulate ornamentals such as planters, furniture and the like and this proposal does not intend to regulate them.

CODE CHANGES RESOURCE COLLECTION – INTERNATIONAL BUILDING CODE

IBC 1013.3: This section is also clarified to apply to only required guards. In the disapproval of E96-06/07, committee notes that they feel that exceptions 1 and 2 are redundant. A careful reading of the text revisions reveals a subtle difference. Exception 1 is a general exception for guard height along stairs. Exception 2 addresses the guard height where the top of the guard serves as a handrail. This distinction is intended to provide clarification in the code for the two possible scenarios.

The majority of the revision in this section and exception involve editorial rewording of the sentences for clarity and consistency. The technical change is to exception 1 to reduce the maximum opening (8" to 4-3/8" inches) for this upper portion of the guard above 36 inches.

The 8 inch limitation on openings at the upper section of the guard was based on the difference between the 34 inch height being the part of the guard that protects small children and the 42 inch height for the rest of the population. However this does not take into account that residential R-3 use groups require a minimum guard height of 36 inches. Proposed exception 1 raises the height for which the 4 inch opening requirement is applicable - to coincide with the minimum guard height of 36 inches in residential occupancies.

The change in maximum opening size at the upper portion of the guard, from the current 8 inch sphere criteria to a 4-3/8 inch sphere, is based on providing an equivalent level of protection as that provided by the current 4 inch opening on the lower portion of the guard. As a point of reference, the following measurements of head sizes of infants are excerpted from Drawing #2 Measurement of Infants from a book entitled "The Measure of Man and Woman: Human Factors" by Alvin R. Tilley, first published by Whitney Library of Design in 1993, republished and copyrighted by John Wiley & Sons, New York (ISBN 0-471-09955-4) in 2002.

The publication states "We have chosen to accommodate 98% of the U.S. population, which lies between the 99 percentile and the 1 percentile, for product designs for civilians" page 10-11 headlined percentiles.

Age	Side-to-side measurement	Back-to-front measurement
12-15 months:	5"	6.5"
16-19 months:	5"	6.5"
20-23 months:	5.1"	6.8"

Additional point of reference, from the same book entitled "The Measure of Man and Woman: Human Factors" by Alvin R. Tilley, figure number 8, page 14, showing child age 2.5 – 3 years. The chest dimension when scaled (1" = 12") shows a 4-3/4" dimension from the back to the front.

The following information from various resources has been compiled to illustrate how countries outside of the US are regulating the openings in guards:

Country of Origin	Sphere Rule Metric	Sphere Rule Inches
Canada	100mm	3.94"
United Kingdom	100mm	3.94"
United States	102mm	4"
Australia	125mm	4.92"
Germany	120mm	4.72"
France	110mm	4.33"
Mexico (no code – standard followed)	102mm – 152mm	4" – 6"
Russia	100mm	3.94"
Romania	100mm	3.94"
Trinidad & Tobago	102mm	4"
Japan (Confirmation Pending)	125mm	4.92"
Spain (Confirmation Pending)	(120mm) (125mm)	(4.72") (4.92")
Switzerland	120mm	4.72"
Sweden	100mm	3.94"
Taiwan (Confirmation Pending)	125mm	4.92"
Singapore (Confirmation Pending)	125mm	4.92"
Poland (Confirmation Pending)	100mm	3.94"
Turkey	100 mm	3.94"
Netherlands (Confirmation Pending)	100mm	3.94"

Part II – IRC

IRC R312.1: This section is being divided into two sections, similar to the IBC. The first section includes the general guard requirement, and the new section (R312.2) includes the height requirements. See reason for IBC Section 1013.1.

IRC R312.2: This new section includes the guard height requirements. It is reformatted to place emphasis on the 36" high guard required at level surfaces. There are not technical changes to the minimum height. As noted in the current text to IRC Section R312.2, the IRC applies to required guards. The term "required" is proposed here as well. This section uses the term "adjacent fixed seating" – intended to clarify that where there is built-in seating, the guard height is to be measured from the seat itself to provide for the minimum required height where it is assumed that children may be standing. See reason for IBC Section 1013.2.

IRC R312.3: The majority of the revision in this section and exception involve editorial rewording of the sentences for clarity and consistency.

Bibliography:

Interim Report No. 1 of the CTC, Area of Study – Climable Guards, March 9, 2006.
 "The Measure of Man and Woman: Human Factors" by Alvin R. Tilley

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

PART I – IBC MEANS OF EGRESS

Committee Action:

Approved as Submitted

Committee Reason: The proposal comprehensively revises guard requirements and clarifies where they are required. It also directs users to the appropriate structural provisions.

Assembly Action:

None

PART II – IRC B/E**Committee Action:****Approved as Submitted**

Committee Reason: The committee agreed that the rewording of this section which includes fixed seating as a measuring point for guard rails and new language on how to measure open sided walking surfaces at any point within 36 inches horizontally to the edge of the open side significantly improves the existing code language. The committee felt this new language helps to address a significant amount of issues with where guards are to be located and how they are to be measured while bringing the *International Residential Code* closer to the current language in the *International Building Code*.

Assembly Action:**None**

Final Hearing Results	
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E85-07/08, Part I	AS
E85-07/08, Part II	AS

Code Change No: E91-07/08

Original Proposal

Sections: 1014.1 (IFC [B] 1014.1)**Proponent:** Anne R. vonWeller, Murray City, UT, representing Utah Chapter of ICC**Revise as follows:**

1014.1 (IFC [B] 1014.1) General. The exit access arrangement shall comply with Sections 1014 through 1017 and the applicable provisions of Sections 1003 through 1013. Exit access arrangement shall comply with Sections 1014 through 1017.

Reason: The change is editorial and made to clarify all of the applicable requirements of 1003 through 1013 apply to the exit access, not just the provisions related to exit access arrangement.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:**Approved as Submitted**

Committee Reason: The additional language clarifies the intent of the organization of Chapter 10 exit access requirements.

Assembly Action:**None**

Final Hearing Results	
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E91-07/08	AS
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Code Change No: **E92-07/08**

Original Proposal

Sections: 1014.2 (IFC [B] 1014.2)

Proponent: Gary Lampella, City of Redmond, OR, representing Oregon Officials Association

Revise as follows:

1014.2 (IFC [B] 1014.2) (Supp) Egress through intervening spaces. Egress through intervening spaces shall comply with this section.

1. Egress from a room or space shall not pass through adjoining or intervening rooms or areas, except where such adjoining rooms or areas and the area served are accessory to ~~the area served~~ one or the other, are not a Group H occupancy and provide a discernible path of egress travel to an exit.

Exception: Means of egress are not prohibited through adjoining or intervening rooms or spaces in a Group H, S or F occupancy when the adjoining or intervening rooms or spaces are the same or a lesser hazard occupancy group.

2. Egress shall not pass through kitchens, storage rooms, closets or spaces used for similar purposes.

Exceptions:

1. Means of egress are not prohibited through a kitchen area serving adjoining rooms constituting part of the same dwelling unit or sleeping unit.
2. Means of egress are not prohibited through stockrooms in Group M occupancies when all of the following are met:
 - 2.1. The stock is of the same hazard classification as that found in the main retail area;
 - 2.2. Not more than 50 percent of the exit access is through the stockroom;
 - 2.3. The stockroom is not subject to locking from the egress side; and
 - 2.4. There is a demarcated, minimum 44-inch-wide (1118 mm) aisle defined by full or partial height fixed walls or similar construction that will maintain the required width and lead directly from the retail area to the exit without obstructions.
3. An exit access shall not pass through a room that can be locked to prevent egress.
4. Means of egress from dwelling units or sleeping areas shall not lead through other sleeping areas, toilet rooms or bathrooms.

Reason: The code as currently written does not allow a small accessory use to egress through a larger space. Since the term “except where such adjoining rooms or areas are accessory to the area served” indicates that a larger space exiting through a smaller space is the only egress configuration that is allowed. An example would be a large retail store where there was a manager’s office that was accessory to the M occupancy. The office being an accessory use could have the occupants from the M egress through it, but you would not be permitted to egress from the office into the M occupancy because the M is not accessory to the office.

The definition for “accessory” can be found in Section 508.3.1 which limits them to being subsidiary to the main occupancy of the building, and not occupying more than 10 percent of area of the story in which they are located. . In essence the code prohibits an accessory use, such as described above, from exiting into the main occupancy of the building but allows the main occupancy, which could be considerably larger, to exit through the accessory use.

Section 1014.2.1 was revised in Detroit via a public comment to recognize that some smaller separate tenants could have a means of egress through a larger separate tenant. This code change would simply allow one tenant space to have a means of egress that separate tenants are currently permitted to have.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The proposed language assists in understanding the intent for egress through other spaces. Egress should be permitted when the areas are related to each other and basically the same space. The phrase "to the area served" has been misinterpreted to prohibit an office area from exiting through a warehouse.

Assembly Action:

None

Final Hearing Results

E92-07/08

AS

Code Change No: **E93-07/08**

Original Proposal

Sections: 1014.2.1 (IFC [B] 1014.2.1)

Proponent: John Berry, Cole + Russell Architects, Inc

Revise as follows:

1014.2.1 (IFC [B] 1014.2.1) Multiple tenants. Where more than one tenant occupies any one floor of a building or structure, each tenant space, dwelling unit and sleeping unit shall be provided with access to the required exits without passing through adjacent tenant spaces, dwelling units and sleeping units.

Exception: ~~The Means~~ means of egress ~~from a smaller tenant space~~ shall not be prohibited ~~from passing~~ through ~~a larger~~ adjoining tenant space where such rooms or spaces ~~of the smaller tenant~~ occupy less than 10 percent of the area of the ~~larger~~ tenant space through which they pass; are the same or similar occupancy group; a discernable path of egress travel to an exit is provided; and the means of egress into the adjoining space is not subject to locking from the egress side. A required means of egress serving the larger tenant space shall not pass through the smaller tenant space or spaces.

Reason: The intent of this code change is simply to add clarifying language as to which tenant space is egressing through the other. I have had several people ask for clarification on how this section was to be applied. I believe the original change was needed and appropriate, but it just needs a little more clarification.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The proposal clarifies the intent of the exception for small tenant spaces within a larger mercantile space.

Assembly Action:

None

Final Hearing Results

E93-07/08

AS

Code Change No: **E95-07/08**

Original Proposal

Sections: 1002.1, 1014.2.3 (IFC [B] 1002.1, [B] 1014.2.3)

Proponent: Roger Severson, RSA Consulting, representing Oregon Department of Health Services

1. Add new definition as follows:

1002.1 (IFC [B] 1002.1) Definitions. The following words and terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

SUITE. A group of patient treatment rooms or patient sleeping rooms within Group I-2 occupancies where there is direct and constant visual supervision of all patients within the suite, and the suite is in conformance with the requirements of Section 1014.2.2 through 1014.2.6.

2. Revise as follows:

1014.2.3 (IFC [B] 1014.2.3) (Supp) Suites in patient sleeping areas. Patient sleeping areas in Group I-2 Occupancies shall be permitted to be divided into suites with one intervening room where ~~if one of the following conditions is~~ are met:

1. The intervening room within the suite is not used as an exit access for more than eight patient beds.
2. The arrangement of the suite allows for direct and constant visual supervision by nursing personnel.

Reason: Suite definition - The IBC currently contains some requirements for suites but there is not an explanation or definition to inform the reader as to the intent of the suite. The concept for suites to function within the code without corridor width or rating requirements were accepted to allow staff to have clear and unobstructed supervision of patients in specific treatment and sleeping rooms. It was not, and is not intended for day rooms or business sections of the hospital. Without a definition this concept is vague, leaving doubt and confusion for all who are responsible for the construction of suites within Health Care Facilities.

Section 1014.2.3 - In order to avoid a conflict, a revision to Section 1014.2.3 of the 2007 supplement is needed that would require both items, rather than having a choice as proposed. Regardless of the concern for conflict, the existing code does not state that only one of the exceptions is permitted. The Oregon Health Care Facilities Committee is not sure why the original proposal allowed the choice? With this revision, Oregon is in support of the supplemental language and the proposals by Washington submitted for this cycle. The original proponent of this section, John Williams of the Construction Review Section of Washington's DOH is in support of this revision.

Cost Impact: Depending on previous codes used and/or other applicable codes today, this code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Modified

Modify the proposal as follows:

1002.1 (IFC [B] 1002.1) Definitions. The following words and terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

SUITE. A group of patient treatment rooms or patient sleeping rooms within Group I-2 occupancies where staff are in attendance within the suite, ~~for there is direct and constant visual~~ supervision of all patients within the suite, and the suite is in conformance with the requirements of Section 1014.2.2 through 1014.2.6.

1014.2.3 (IFC [B] 1014.2.3) (Supp) Suites in patient sleeping areas. Patient sleeping areas in Group I-2 Occupancies shall be permitted to be divided into suites with one intervening room ~~where~~ if one of the following conditions is ~~are~~ met:

1. The intervening room within the suite is not used as an exit access for more than eight patient beds.
2. The arrangement of the suite allows for direct and constant visual supervision by nursing personnel.

Committee Reason: The revisions to Section 1014.2.3 were disapproved for coordination with the modification to the definition. This new definition, with the modification, clarifies the definition for "suite" by defining the supervision and arrangement of the rooms within a suite. This coordinates with the 2007 Supplement, Sections 1014.2.2 through 1014.2.6

Assembly Action:

None

Final Hearing Results

E95-07/08

AM

Code Change No: E96-07/08

Original Proposal

Sections: 1014.2.2.5 (New) [IFC [B] 1014.2.2.5 (New)]

Proponent: Roger Severson, RSA Consulting, representing Oregon Department of Health Services

Add new text as follows:

1014.2.2.5 (IFC [B] 1014.2.2.5) Exit access through suites. Exit access from all other portions of a building in a Group I-2 occupancy, including exit access from other suites, shall not pass through a suite.

Reason: Exit access not to pass through suites- This new section is an important concept which is implied but silent regarding the use of suites. Unlike the use of room to room, or intervening room exit access, suites have a very specific function for medical and health practices and should not be used as an exit access from other portions of the facility. Also, because suites are not required to have minimum access width or ratings within the suite for the benefit of operations and supervision, exit access from other portions of a facility should not be designed through this space.

Cost Impact: Where there are areas that never had requirements in a previous code prior to the IBC, the code change proposal could cause an increase to the cost of construction.

Public Hearing Results

Committee Action:

Approved as Modified

Modify the proposal as follows:

1014.2.2.5 (IFC [B] 1014.2.2.5) Exit access through suites. Exit access from all other portions of a building not classifies as a suite in a Group I-2 occupancy, ~~including exit access from other suites,~~ shall not pass through a suite.

Committee Reason: The modification clarifies that it is acceptable to egress through a suite when coming from another suite. This is important for a defend-in-place scenario to allow for lift support facilities to be available in both locations – which is not an option in a corridor. This proposal, as modified, clarifies exiting from a suite. The definition for suite would include associated storage rooms and bathrooms, therefore, these spaces could also egress through the suite to a corridor or another suite.

Assembly Action:

None

Final Hearing Results

E96-07/08

AM

Code Change No: E101-07/08

Original Proposal

Sections: 1015.5 (IFC [B] 1015.5)

Proponent: James C. Gerren, Clark County Department of Development Services

Revise as follows:

1015.5 (IFC [B] 1015.5) Refrigerated rooms or spaces. Rooms or spaces having a floor area of larger than 1,000 square feet (93m²) ~~or more~~, containing a refrigerant evaporator and maintained at a temperature below 68°F (20°C), shall have access to not less than two exits or exit access doors.

Travel distance shall be determined as specified in Section 1016.1, but all portions of a refrigerated room or space shall be within 150 feet (45 720 mm) of an exit or exit access door where such rooms are not protected by an approved automatic sprinkler system. Egress is allowed through adjoining refrigerated rooms or spaces.

Exception: Where using refrigerants in quantities limited to the amounts based on the volume set forth in the *International Mechanical Code*.

Reason: The purpose of the proposed change is to make the syntax of IBC Section 1015.5 consistent with the rest of the code. In all other sections that reference criteria based on floor area, the language used consistently indicates that the requirement applies when a floor area is exceeded. For example, Section 1015.3 applies "where the area is over 500 square feet" while Section 1015.4 applies to "rooms larger than 1,000 square feet". However, Section 1015.5 currently applies to "a floor area of 1,000 square feet or more". The proposed change would make the language of Section 1015.5 more consistent with the terminology used throughout the rest of the IBC.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: This proposal clarifies the intent and brings consistency to the code.

Assembly Action:

None

Final Hearing Results

E101-07/08

AS

Code Change No: E105-07/08

Original Proposal

Sections: 1002.1, 1007.3 (IFC [B] 1002.1, [B] 1007.3)

Proponent: Sarah A Rice, CBO, Schirmer Engineering Corporation

Revise as follows:

1002.1 (IFC [B] 1002.1) Definitions. The following words and terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

ACCESSIBLE MEANS OF EGRESS. A continuous and unobstructed way of egress travel from any accessible point in a building or facility to a place designated for assisted rescue or a public way.

1007.3 (IFC [B] 1007.3) (Supp) Exit Stairways. In order to be considered part of an accessible means of egress, an exit or exit access stairway shall have a clear width of 48 inches (1219 mm) minimum between handrails and shall either incorporate an area of refuge within an enlarged floor-level landing or shall be accessed from either an area of refuge complying with Section 1007.6 or a horizontal exit

Exceptions:

1. The area of refuge is not required at ~~unenclosed interior~~ open exit access or exit stairways as permitted by ~~Section~~ Sections 1016.1 and 1020.1 in buildings or facilities that are equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2.
2. The clear width of 48 inches (1219 mm) between handrails is not required at exit access or exit stairways in buildings or facilities equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2.
3. Areas of refuge are not required at exit stairways in buildings or facilities equipped throughout by an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2.
4. The clear width of 48 inches (1219 mm) between handrails is not required for exit stairways accessed from a horizontal exit.
5. Areas of refuge are not required at exit stairways serving open parking garages.
6. Areas of refuge are not required for smoke protected seating areas complying with Section 1025.6.2.
7. The areas of refuge are not required in Group R-2 occupancies.

Reason: The proposed language is part of a package of code changes that is intended to clarify how an unenclosed stairway can be used as part of the required means of egress system for a building. The package was developed by a group of stakeholders representing code officials, designers and code users who have been working together for the past 6 years to make the provisions for unenclosed vertical egress elements work within the terms and concepts found in the IBC.

The package does the following:

- Officially introduces 3 new terms for elements within the required means of egress; unenclosed vertical exit access, exit access stair and exit access ramp;
 - Allows, through the use of an exception in 1019.1, an unenclosed vertical exit access element (i.e., "exit access stair" or "exit access ramp") to be used in lieu of an enclosed vertical exit (i.e., "exit stair" or "exit ramp");
 - Clarifies that a maximum of 50% of the enclosed vertical exits can be replaced by an unenclosed exit access (1019.1); and
 - Clarifies that when an unenclosed vertical exit access is part of the required means of egress system the exit access travel limits in Section 1016.1 are to be measured down the unenclosed vertical exit access to an exit or exit discharge.
 - Eliminates the option for 100% of the required exits to be replaced with unenclosed exit access elements as this would create a hardship for small buildings (those that are less than 4 stories above or below the level of exit discharge) where 2 accessible means of egress must be provided on all stories. Without at least one enclosed vertical exit, the elevator which would most like have been installed only to provide an accessible route, would now need to be equipped with standby power in accordance with the provisions of 1007.4 (which could add a considerable amount to the overall cost of the project).
 - Clarifies what happens when a corridor that is required to be fire rated terminates at a unenclosed exit access (Section 1017.5)
- Together this package is considered to resolve many of the design quandaries that have been encountered by small buildings (typically 2 stories) wishing to have "openness."

The revision to the definition is to clarify that the stairway or elevator portion of the accessible means of egress may be through assistance by emergency responders. Stairways, while they may include provisions for persons with mobility impairments, are not part of an accessible route. In order to avoid possible entrapment, during emergencies, control and evacuation using the elevators must be by the fire department. The current definition could be interpreted to mean that the entire route must be accessible and unassisted. This leads to confusion between the exiting and entrance requirement.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Modified

Modify the proposal as follows:

1002.1 (IFC [B] 1002.1) Definitions. The following words and terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

ACCESSIBLE MEANS OF EGRESS. A continuous and unobstructed way of egress travel from any accessible point in a building or facility to ~~a place designated for assisted rescue or a public way.~~

(Portions of proposal not shown remain unchanged)

Committee Reason: The modification to remove consideration of the change to the definition of accessible means of egress was done based on the proponent's request. Revisions to Section 1007.3 were approved for coordination with the 2007 Supplement where some open stairways provisions were relocated to Section 1016.1.

Assembly Action:

None

Final Hearing Results

E105-07/08

AM

Code Change No: **E110-07/08**

Original Proposal

Sections: 1002.1, 1016.1, 1019.1 (IFC [B] 1002.1, [B] 1016.1, [B] 1019.1)

Proponent: Anne R. vonWeller, Murraby City UT, representing Utah Chapter ICC

Revise as follows:

1002.1 (IFC [B] 1002.1) Definitions. The following words and terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

EXIT. That portion of a means of egress system which is separated from other interior spaces of a building or structure by fire-resistance-rated construction and opening protectives as required to provide a protected path of egress travel between the exit access and the exit discharge. Exits include exterior exit doors at ~~ground~~ the level of exit discharge, vertical exit enclosures, exit passageways, exterior exit ~~stairs~~ stairway, exterior exit ramps and horizontal exits.

EXIT ACCESS DOORWAY. A door or access point along the path of egress travel from an occupied room, area or space where the path of egress enters an intervening room, corridor, unenclosed exit access stair or unenclosed exit access ramp.

1016.1 (IFC [B] 1016.1) (Supp) Travel distance limitations. Exits shall be so located on each story such that the maximum length of exit access travel, measured from the most remote point within a story ~~to the entrance to an exit~~ along the natural and unobstructed path of egress travel to an exterior exit door at the level of exit discharge, an entrance to a vertical exit enclosure, an exit passageway, a horizontal exit, an exterior exit stairway or an exterior exit ramp shall not exceed the distances given in Table 1016.1.

~~Where the path of exit access includes unenclosed stairways or ramps within the exit access, the distance of travel on such means of egress components shall also be included in the travel distance measurement. The measurement along stairways shall be made on a plane parallel and tangent to the stair tread nosings in the center of the stairway.~~

Exceptions:

1. Travel distance in open parking garages is permitted to be measured to the closest riser of open ~~stairs~~ exit stairways.
2. In outdoor facilities with open exit access components and open exterior ~~stairs~~ exit stairways or exit ramps, travel distance is permitted to be measured to the closest riser of ~~a stair~~ an exit stairway or the closest slope of the exit ramp.
3. In other than occupancy Groups H and I, the exit access travel distance to a maximum of 50 percent of the exits is permitted to be measured from the most remote point within a building to an exit using unenclosed exit access stairways or ramps when connecting a maximum of two stories. The two connected stories shall be provided with at least two means of egress. Such interconnected stories shall not be open to other stories. ~~The measurement along stairways shall be made on a plane parallel and tangent to the stair tread nosings in the center of the stairway.~~

4. In other than occupancy Groups H and I, exit access travel distance is permitted to be measured from the most remote point within a building to an exit using unenclosed exit access stairways or ramps in the first and second stories above grade plane in buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1. The first and second stories above grade plane shall be provided with at least two means of egress. Such interconnected stories shall not be open to other stories. ~~The measurement along stairways shall be made on a plane parallel and tangent to the stair tread nosings in the center of the stairway.~~

Where applicable, travel distance on unenclosed exit access stairways or ramps and on connecting stories shall also be included in the travel distance measurement. The measurement along stairways shall be made on a plane parallel and tangent to the stair tread nosings in the center of the stairway.

1019.1 (IFC [B] 1019.1) (Supp) Exits from stories. All spaces within each story shall have access to the minimum number of approved independent exits as specified in Table 1019.1 based on the occupant load of the story. For the purposes of this chapter, occupied roofs shall be provided with exits as required for stories. ~~The required number of exits from any story shall be maintained until arrival at grade or the public way.~~

Exceptions:

1. As modified by Section 403.15 (*Additional exit stairway*).
2. As modified by Section 1019.2.
3. ~~Rooms and spaces within each story provided with and having access to a means of egress that complies with Exception 3 or 4 in Section 1016.1 shall not be required to be~~ Exit access stairways and ramps that comply with Exception 3 or 4 of Section 1016.1 shall be permitted to provide the minimum number of approved independent exits required by Table 1019 on each story.
4. In Groups R-2 and R-3 occupancies, one means of egress is permitted within and from individual dwelling units with a maximum occupant load of 20 where the dwelling unit is equipped throughout with an automatic sprinkler system in accordance with Sections 903.3.1.1 or 903.3.1.2.

The required number of exits from any story shall be maintained until arrival at grade or the public way.

Reason: This change is offered to make terms consistent in Chapter 10 and help clarify the understanding of how certain unenclosed stairways should appropriately be considered 'exit access stairways' without changing the current intent of the code.

There remains a good deal of confusion about the appropriate application of unenclosed stairways and ramps under the IBC. During the last cycle, the final action moved two exceptions to 1020.1 from the exit enclosure provisions to exceptions for travel distance. Admittedly, travel distance is a very important issue related to unenclosed stairways, but by removing the provisions from those for interior exit stairways and making them exceptions to travel distance will result in further confusion unless additional changes are made to clearly identify these stairways as exit access. Also, parts of the base provisions for 1016.1 and 1091.1 should be moved after the exceptions so they apply correctly to important issues such as measurement of travel distance on unenclosed stairways and maintenance of number of required exits.

The term 'exit access doorway' is used in 13 sections in the IBC (405.8.1, 411.7, 414.7.2, 715.4.3, 1004.3, 1008.1.3.5, 1015.1, 1015.2, 1015.4, 1015.4, 1017.3 and 1025.9). Exit access doorways are used to design many critical aspects of the means of egress including arrangement, number, separation, opening protection and exit sign placement. It is important to include a definition of 'exit access doorway' with this change because as we clarify that the stairways described in 1016.1 exceptions 4 and 5 are exit access stairways, we need to ensure the term exit access doorway is inclusive of specific points in the means of egress which may not include a 'doorway' such as when an unenclosed exit access stairway is used in the egress path.

Exception 3 to 1019.1 is confusing and seems to say one doesn't have to provide required exits as long as exceptions 3 and 4 to Section 1016.1 are met. Each of those exceptions only requires two means of egress. This change makes it clear all the required exits are to be provided and compliant exit access stairways are permitted to be used to help provide them.

Cost Impact: The code change will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The proposal would coordinate with the open exit and exit access stairways as provided for in the 2007 Supplement. This clarifies this issues and how to use these elements. A definition for vertical exit enclosure may also be helpful. This should be referred to the Code Technologies Committee. See the committee action on E103-07/08.

Assembly Action:

None

Final Hearing Results

E110-07/08

AS

Code Change No: **E111-07/08**

Original Proposal

Table 1016.1 (IFC [B] Table 1016.1)

Proponent: Sarah A. Rice, Schirmer Engineering Corporation

Revise as follows:

**TABLE 1016.1 (IFC [B] TABLE 1016.1)
EXIT ACCESS TRAVEL DISTANCE^a**

OCCUPANCY	WITHOUT SPRINKLER SYSTEM (feet)	WITH SPRINKLER SYSTEM (feet)
A, E, F-1, I-1, M, R, S1	200	250 ^b
I-1, R	Not Permitted	250 ^b
B	200	300 ^b
F-2, S2, U	300	400 ^b
H-1	Not Permitted	75 ^b
H-2	Not Permitted	100 ^b
H-3	Not Permitted	150 ^b
H-4	Not Permitted	175 ^b
H-5	Not Permitted	200 ^b
I-2, I-3, I-4	450 Not Permitted	200 ^b

For SI: 1 foot = 304.8 mm.

- a. See the following sections for modifications to exit access travel distance requirements:
 - Section 402.4: For the distance limitation in malls.
 - Section 404.8: For the distance limitation through an atrium space.
 - Section 407.4: For the distance limitation in Group I-2.
 - Section 408.6.1 and 408.7.1: For the distance limitations in Group I-3.
 - Sections 411.4: For the distance limitation in Special Amusement Buildings.
 - Section 1014.2.2: For the distance limitation in Group I-2 Hospital Suites.
 - Section 1015.4: For the distance limitation in refrigeration machinery rooms.
 - Section 1015.5: For the distance limitation in refrigerated rooms and spaces
 - Section 1016.2 For increased limitations in Groups F-1 and S-1.
 - Section 1025.7: For increased limitation in assembly seating.
 - Section 1025.7: For increased limitation for assembly open-air seating.
 - Section 1019.2: For buildings with one exit.
 - Section 3103.4: For temporary structures
 - Section 3104.9: For pedestrian walkways
 - Chapter 31: For the limitation in temporary structures.
- b. Buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2. See Section 903 for occupancies where automatic sprinkler systems in accordance with Section 903.3.1.2 are permitted.
- c. Buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.

Reason: The proposal has two purposes. First to correct the table as it addresses Group I and R occupancies. Per section 903.2 these occupancies have to be protected by an automatic sprinkler system. Therefore there is no need to list a travel distance for an unsprinklered situation. These are the changes within the table itself. With respect to the revision to footnote a, the existing footnote lists 7 code sections where travel distance is modified. The list is incomplete; there are at least 14 locations where travel distance is modified. The proposal adds the other 7 locations. This unfortunately results in a fairly long laundry list in a footnote. Since the code sections referenced are fairly specific to section perhaps the topic addressed by the section is extra information. The extra information does prevent unnecessary searching of other sections. An argument can be made that if one is considering a covered mall building, one is already looking at Section 402 and shouldn't need a reminder in Chapter 10 that there is something else to look for. An alternative to a long laundry list in footnote a would be to revise it as follows: "a. See the following sections for modifications to exit access travel distance for specific occupancies and spaces: 402.4, 404.8, 407.4, 408.6.1, 408.7.1, 411.4, 1014.2.2, 1015.4, 1015.5, 1016.2, 1019.2, 1025.7. 3103.3, 3104.9."

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The additional language provides a good cross reference and clarification for Table 1016.1.

Assembly Action:

None

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

*Public Comment:***Carroll Lee Pruitt, FAIA, Pruitt Consulting, representing North Texas Chapter of ICC, requests Approval as Modified by this public comment.**

Modify table as follows:

OCCUPANCY	WITHOUT SPRINKLER SYSTEM (feet)	WITH SPRINKLER SYSTEM (feet)
A, E,F-1, M, R, S1	200	250 ^b
I-1, R	Not Permitted	250 ^b

(Portions of table and footnotes not shown remain unchanged)

Commenter's Reason: The code change as approved eliminates the use of NFPA13D fire sprinkler systems permitted by Section 903.3.13 for one- and two- family dwellings as these facilities are not considered sprinklered for code permitted trade offs or reductions. Unless these types of structures were protected with a NFPA 13 or 13R system under the original submittal, there would be no allowed travel distance in these types of buildings. This would be better handled by an appropriate footnote, however, that was not a part of this code change. If this challenge is approved, we will bring back the appropriate code change in the next cycle.

Final Hearing Results

E111-07/08

AMPC

Code Change No: E112-07/08

Original Proposal

Sections: 1016.2 [IFC [B] 1016.2)

Proponent: Rick Thornberry, PE, The Code Consortium, Inc., representing AAMA Smoke Vent Task Group

Revise as follows:

1016.2 (IFC [B] 1016.2) Roof Smoke and heat vent increase. In buildings that are one story in height, equipped with automatic ~~heat and~~ smoke ~~and heat~~ roof vents complying with Section 910 and equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1, the maximum exit access travel distance shall be 400 feet (122 m) for occupancies in Group F-1 or S-1.

Reason: Editorial.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The revision to the definition would use correct language for smoke and heat vents.

Assembly Action:

None

Final Hearing Results

E112-07/08

AS

Code Change No: **E114-07/08**

Original Proposal

Table 1016.1, 1016.2 (IFC [B] Table 1016.1, [B] 1016.2); IFC 910.2.3 (IBC [F] 910.2.3)

Proponent: Richard Schulte, Schulte & Associates

1. Revise IBC as follows:

**TABLE 1016.1 (IFC [B] TABLE 1016.1)
EXIT ACCESS TRAVEL DISTANCE**

(No change to table entries)

For SI: 1 foot = 304.8 mm.

- a. See the following sections for modifications to exit access travel distance requirements:
 - Section 402: For the distance limitation in malls.
 - Section 404: For the distance limitation through an atrium space.
 - ~~Section 1016.2 For increased limitations in Groups F-1 and S-1.~~
 - Section 1025.7: For increased limitation in assembly seating.
 - Section 1025.7: For increased limitation for assembly open-air seating.
 - Section 1019.2: For buildings with one exit.
 - Chapter 31: For the limitation in temporary structures.
- b. Buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2. See Section 903 for occupancies where automatic sprinkler systems in accordance with Section 903.3.1.2 are permitted.
- c. Buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.

~~**1016.2 (IFC [B] 1016.2) Roof vent increase.** In buildings that are one story in height, equipped with automatic heat and smoke roof vents complying with Section 910 and equipped throughout with an automatic sprinkler system in accordance with Section 903.1.1, the maximum exit access travel distance shall be 400 feet (122 m) for occupancies in Group F-1 or S-1.~~

2. Revise IFC as follows:

~~**IFC 910.2.3 (IBC [F] 910.2.3 Exit access travel distance increase.** Buildings and portions thereof used as a Group F-1 or S-1 occupancy where the maximum exit access travel distance is increased in accordance with Section 1016.2.~~

Reason: The purpose of this code change proposal is to delete the provision which allows an increase in travel distance to 400 feet in one story Group F-1 and S-1 occupancies protected by a sprinkler system and provided with smoke and heat (roof) vents.

At present, the IBC permits travel distance to be increased from 200 feet to 250 feet in Group F-1 and S-1 occupancies when sprinkler protection is provided. Section 1016.2 allows an additional 150 feet of travel distance in Group F-1 and S-1 occupancies above and beyond that permitted when sprinkler protection is provided when smoke and heat (roof) vents are also provided.

While smoke and heat (roof) vents by themselves will automatically vent smoke and heat generated by a fire in an unsprinklered one story building, there is serious doubt whether or not smoke and heat (roof) vents actually perform their intended function in buildings protected throughout by a sprinkler system.

Fire tests utilizing a combination of standard spray sprinklers and fusible link-activated smoke and heat (roof) vents conducted at Underwriters Laboratories (UL) in 1997 and 1998 clearly demonstrated that operating sprinklers interfere with the opening of roof vents. The following are quotes from the report of the tests at UL, "Sprinkler, Smoke & Heat Vent, Draft Curtain Interaction -- Large Scale Experiments and Model Development", dated September 1998. (The report is referred to as NISTIR 6196-1.)

"It had become clear by this time in the project that the vents were unlikely to open when the fire was ignited more than about 4.6 m (15 ft) away." (Page 54, NISTIR 6196-1)

". . . it appears from the data below that the sprinkler spray influenced the thermal response characteristics of this particular vent, and it is believed that sprinklers could have a similar influence on similar vent designs." (Page 64, NISTIR 6196-1)

"Six other tests were performed with the fire at this distance from the vent when the vent was equipped with a fusible link, and in none of these tests did the vent open. . . Examination of the near-ceiling temperatures from all the tests indicates that sprinklers of this type [standard spray sprinklers] have a significant cooling effect, and this will certainly have an effect on thermally-responsive, independently-controlled vents." (Page 64, NISTIR 6196-1)

"In Plastic Test P-2, the fire was ignited directly under a vent. In the experiment, flames reached the top of the central array at about 65 s and the vent cavity at about 70 s. The first sprinkler activated at 100 s. The vent did not open at any time during the 30 min test even though another vent 6 m (20 ft) to the west of the unopened vent opened at 6:04." Page 64, NISTIR 6196-1)

"This data, along with the plunge tunnel measurements reported in Section 3.1.4, suggests that the fusible link reached its activation temperature before or at about the same time as the first sprinkler activated, but the link did not fuse. It is not clear whether the link did not fuse because it was cooled directly by water drawn upwards into the vent cavity, or whether the sprinkler spray simply cooled the rising smoke plume enough to prevent the link from fusing. In any event, this phenomenon deserves further study." (Page 64, NISTIR 6196-1)

"The mass flow rates [through the vents] for Test I-10 and P-5 are relatively low compared with the theoretical maximum because the near-ceiling gas temperatures are greatly reduced by the sprinklers." (Page 100, NISTIR 6196-1)

"The significant cooling effect of sprinkler sprays on the near-ceiling gas flow often prevented the automatic operation of vents. This conclusion is based on thermocouple measurements within the vent cavity, the presence of drips of solder on the fusible links recovered from unopened vents, and several tests where vents remote from the fire and the sprinkler spray activated. In one cartoned plastic commodity experiment, a vent did not open when the fire was ignited directly beneath it." (Page 101, NISTIR 6196-1)

NFPA 204 also clearly indicates that operating sprinklers will reduce the venting rate through any vents which do open due to the reduction of temperature in the vicinity of the vent caused by operating sprinklers. The following is an excerpt from the 2002 edition of NFPA 204:

"A.4.4.3 Mass flow through a vent is governed mainly by the vent area and the depth of the smoke layer and its temperature. Venting becomes more effective with smoke temperature differentials between ambient temperature and an upper layer of approximately 110°C [198°F] or higher. Where temperature differences of less than 110°C [198°F] are expected, vent flows might be reduced significantly. . ."

The following are quotes from Dr. Craig Beyler, Hughes Associates, Inc. regarding the operation of smoke and heat (roof) vents in buildings protected by a sprinkler system:

"The experimental studies have shown that . . . current design practices are likely to limit the number of vents operated to one and vents may in fact not operate at all in very successful sprinkler operations." (Page 1, "Interaction of Sprinklers with Smoke and Heat Vents")

Not only is the fear of early operation not founded, current design practice will likely lead to 0-1 vents operating" ("Page 61,"

"Sprinkler/Vent Interactions-What people think, what we know, and what we don't.")

"Eliminates Need for Manual Venting? No" (Page 42, ""Sprinkler/Vent Interactions-What people think, what we know, and what we don't.")

"Revised design methods for early operation of vents are needed" (Page 61, "Sprinkler/Vent Interactions-What people think, what we know, and what we don't.")

Given the above, it can be concluded that smoke and heat (roof) vents do not actually operate as expected in buildings protected by a sprinkler system. Based upon this, it can be concluded that there is no technical basis for permitting an increase in travel distance of 150 feet beyond the travel distance permitted for Group F-1 and S-1 occupancies protected by a sprinkler system when smoke and heat (roof) vents are provided.

Bibliography

1. "Sprinkler, Smoke & Heat Vent, Draft Curtain Interaction -- Large Scale Experiments and Model Development" (NISTIR 6196-1), Kevin B. McGrattan, Anthony Hamins, David Stroup, September 1998.
<http://www.fire.nist.gov/bfrlpubs/fire98/PDF/f98069.pdf>
2. "Interaction of Sprinklers with Smoke and Heat Vents", Craig L. Beyler and Leonard Y. Cooper, February 1999.
<http://www.haifire.com/publications/Paper21.pdf>
3. "Sprinkler/Vent Interactions-What people think, what we know, and what we don't.", Dr. Craig Beyler, Hughes Associates, Inc. (undated presentation).
<http://www.haifire.com/presentations/Sprinkler%20Vent%20Interactions%20-%20NFPA%202000.pdf>
4. NFPA 204, Standard for Smoke and Heat Venting (2002 edition).

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: Fire fighter safety is a concern in these buildings. In this situation, the tenability in the building will diminish even with the sprinklers in operation, and the 400 feet in and 400 feet out in a building is a hazard for these responders. The correlative reference in the IFC should be struck for consistency.

Assembly Action:

None

Final Hearing Results

E114-07/08

AS

Code Change No: E121-07/08

Original Proposal

Sections: 1017.2 (IFC [B] 1017.2)

Proponent: John Williams, State of Washington Department of Health, Construction Review Services

Revise as follows:

1017.2 (IFC [B] 1017.2) (Supp) Corridor width. The minimum corridor width shall be as determined in Section 1005.1, but not less than 44 inches (1118 mm).

Exceptions:

1. Twenty-four inches (610 mm)—For access to and utilization of electrical, mechanical or plumbing systems or equipment.
2. Thirty-six inches (914 mm)—With a required occupant capacity of less than 50.
3. Thirty-six inches (914 mm)—Within a dwelling unit.
4. Seventy-two inches (1829 mm)—In Group E with a corridor having a required capacity of 100 or more.
5. Seventy-two inches (1829 mm)—In corridors ~~and areas serving gurney traffic in surgical Group I, health care centers for ambulatory patients receiving occupancies where patients receive outpatient medical care,~~ which causes the patient to be not capable of self-preservation
6. Ninety-six inches (2438 mm)—In Group I-2 in areas where required for bed movement.

The required width of corridors shall be unobstructed.

Exception: Doors complying with Section 1005.2.

Reason: The purpose of this code change is to revise outdated material. The combination of the term “surgical Group I” with the term “outpatients” does not capture the intent of the code. It has become a common industry practice to perform some surgical procedures in “ambulatory surgery centers” without 24 hour care. Such facilities are currently classified as a B occupancy. This code is meant to apply to outpatient surgical areas, which could be typical hospitals under Group I or “ambulatory surgery centers” under Group B.

This change in medical industry practice is being addressed by a CTC workgroup. This change would require a wider corridor wherever there is outpatient surgery, not just Group I. This wider corridor is needed only where there is gurney traffic, not in business office areas.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The proposed language is a clarification that this corridor width is applicable to Group B and Group I facilities where gurney traffic occurs, not just Group I.

Assembly Action:

None

Final Hearing Results

E121-07/08

AS

Code Change No: **E122-07/08**

Original Proposal

Sections: 1017.4 (IFC [B] 1017.4) (IMC [B] 601.2)

Proponent: John Williams, State of Washington Department of Health, Construction Review Services

Revise as follows:

1017.4 (IFC [B] 1017.4) (IMC [B] 601.2) Air movement in corridors. Corridors shall not serve as supply, return, exhaust, relief or ventilation air ducts.

Exceptions:

1. Use of a corridor as a source of makeup air for exhaust systems in rooms that open directly onto such corridors, including toilet rooms, bathrooms, dressing rooms, smoking lounges and janitor closets, shall be permitted, provided that each such corridor is directly supplied with outdoor air at a rate greater than the rate of makeup air taken from the corridor.
2. Where located within a dwelling unit, the use of corridors for conveying return air shall not be prohibited.
3. Where located within tenant spaces of 1,000 square feet (93 m²) or less in area, utilization of corridors for conveying return air is permitted.
4. Incidental air movement from pressurized rooms within healthcare facilities, provided that the corridor is not the primary source of supply or return to the room.

Reason: The purpose of this code change is to clarify the code. Healthcare facilities require direct pressurization control of certain rooms to provide a clean or sterile environment for patients. For example, operating rooms and pharmacies are required to be positively pressurized, resulting in a general air movement out of the room. This ensures that airborne contaminants do not infect a sterile procedures or supplies. Pressurization is achieved by supplying air at a greater or lesser rate than the return air. Often code officials interpret that this resulting "incidental air" that flows in or out of the room violates this section.

The proposed language recognizes the need of infection control and clarifies that the corridor should not be the primary source of supply or return. There shall be supply and return air within the room. If the concept of room pressurization for infection control is not allowed there is a daily threat of patients being infected. This should be balanced with the occasional threat of fire

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: An allowance for pressurization of rooms within certain hospital areas where the spreading of germs or contaminants is a concern is appropriate. This is incidental air for the space and will not be a safety hazard for the supply and return within the room.

Assembly Action:

None

Final Hearing Results

E122-07/08

AS

Code Change No: **E126-07/08**

Original Proposal

Sections: 1019.1 (IFC [B] 1019.1)

Proponent: Gerald Anderson, City of Overland Park, KS, representing himself

Revise as follows:

1019.1 (IFC [B] 1019.1) (Supp) Exits from stories. All spaces within each story shall have access to the minimum number of approved independent exits as specified in Table 1019.1 based on the occupant load of the story. For the purposes of this chapter, occupied roofs shall be provided with exits as required for stories. The required number of exits from any story shall be maintained until arrival at grade or the public way.

Exceptions:

1. As modified by Section 403.15 (additional exit stairway).
2. As modified by Section 1019.2.
3. Rooms and spaces within each story provided with and having access to a means of egress that complies with Exception 3 or 4 in Section 1016.1 shall not be required to be provided the minimum number of approved independent exits required by Table 1019 on each story.
4. In Groups R-2 and R-3 occupancies, one means of egress is permitted within and from individual dwelling units with a maximum occupant load of 20 where the dwelling unit is equipped throughout with an automatic sprinkler system in accordance with Sections 903.3.1.1 or 903.3.1.2.
5. Within a story, rooms and spaces complying with Section 1015.1 with exits that discharge directly to the exterior at grade level, are permitted to have one exit.

Reason: The purpose of this code change is to make allowance for those rooms or spaces that have exits independent of the building exits. The exits serving these spaces exit directly at grade. Often times due to grade differentiations these rooms spaces may exit at different levels, thus I did not speak to exits from the basement or first story.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Modified

Modify the proposal as follows:

1019.1 (IFC [B] 1019.1) (Supp) Exits from stories. All spaces within each story shall have access to the minimum number of approved independent exits as specified in Table 1019.1 based on the occupant load of the story. For the purposes of this chapter, occupied roofs shall be provided with exits as required for stories. The required number of exits from any story shall be maintained until arrival at grade or the public way.

Exceptions:

1. As modified by Section 403.15.
2. As modified by Section 1019.2.
3. Rooms and spaces within each story provided with and having access to a means of egress that complies with Exception 3 or 4 in Section 1016.1 shall not be required to be provided the minimum number of approved independent exits required by Table 1019 on each story.
4. In Groups R-2 and R-3 occupancies, one means of egress is permitted within and from individual dwelling units with a maximum occupant load of 20 where the dwelling unit is equipped throughout with an automatic sprinkler system in accordance with Sections 903.3.1.1 or 903.3.1.2.
5. Within a story, rooms and spaces complying with Section 1015.1 with exits that discharge directly to the exterior at ~~grade level~~ the level of exit discharge, are permitted to have one exit.

Committee Reason: The modification is for coordination with the revision to level of exit discharge approved in the committee actions on E8-07/08 and E5-06/07. There are situations where rooms or spaces have independent exits directly to the outside of a building, similar to what is permitted in Section 1019.2, Exception 3. As long as these spaces meet provisions for spaces with one means of egress with access directly to the outside, there is an adequate level of safety provided.

Assembly Action:

None

Final Hearing Results

E126-07/08

AM

Code Change No: **E127-07/08**

Original Proposal

Sections: 1019.2, Table 1019.2, 1015.1, Table 1015.1 (IFC [B] 1019.2, [B] Table 1019.2, [B] 1015.1, [B] Table 1015.1)

Proponent: Jonathan C. Siu, City of Seattle Department of Planning and Development, Gregory R. Keith, Professional heuristic Development, representing The Boeing Company

Revise as follows:

1019.2 (IFC [B] 1019.2) (Supp) ~~Stories with one exit.~~ Single exits. Only one exit shall be required from Group R-3 occupancy buildings or from stories of other buildings as indicated in Table 1019.2. specified below: Occupancies shall be permitted to have a single exit in buildings otherwise required to have more than one exit if the areas served by the single exit do not exceed the limitations of Table 1019.2. Mixed occupancies shall be permitted to be served by single exits provided each individual occupancy complies with the applicable requirements of Table 1019.2 for that occupancy. Where applicable, cumulative occupant loads from adjacent occupancies shall be considered in accordance with the provisions of Section 1004.1. Basements with a single exit shall not be located more than one story below grade plane.

1. ~~Stories meeting the limitations of Table 1021.2.~~
2. ~~Buildings of Group R-3 occupancy.~~

**TABLE 1019.2 (IFC [B] TABLE 1019.2)
(Supp) STORIES WITH ONE EXIT**

STORY ABOVE GRADE PLANE	OCCUPANCY	MAXIMUM OCCUPANTS (OR DWELLING UNITS) PER FLOOR AND TRAVEL DISTANCE TO EXIT
First story or basement	A, B ^d , E ^e , F ^d , M, U, S ^d	49 occupants and 75 feet travel distance
	H-2, H-3	3 occupants and 25 feet travel distance
	H-4, H-5, I, R	10 occupants and 75 feet travel distance
	S ^a	29 occupants and 100 feet travel distance
Second story	B ^b , F, M, S ^a	29 occupants and 75 feet travel distance
	R-2	4 dwelling units and 50 feet travel distance
Third Story	R-2 ^c	4 dwelling units and 50 feet travel distance

For SI: 1 foot = 3048.mm

- a. For the required number of exits for parking structures, see Section 1019.1.1.
- b. For the required number of exits for air traffic control towers, see Section 412.1.

1015.1 (IFC [B] 1015.1) (Supp) Exits or exit access doorways from spaces. Two exits or exit access doorways from any space shall be provided where one of the following conditions exists:

1. The occupant load of the space exceeds one of the values in Table 1015.1.

Exception: In Groups R-2 and R-3 occupancies, one means of egress is permitted within and from individual dwelling units with a maximum occupant load of 20 where the dwelling unit is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2.

2. The common path of egress travel exceeds one of the limitations of Section 1014.3.
3. Where required by Sections 1015.3, 1015.4, 1015.5, 1015.6 or 1015.6.1.

Exception: Group I-2 occupancies shall comply with Section 1014.2.2.

Where a building contains mixed occupancies, each individual occupancy shall comply with the applicable requirements for that occupancy. Where applicable, cumulative occupant loads from adjacent occupancies shall be considered in accordance with the provisions of Section 1004.1.

**TABLE 1015.1 (IFC [B] TABLE 1015.1)
SPACES WITH ONE MEANS OF EGRESS EXIT OR EXT ACCESS DOORWAY**

OCCUPANCY	MAXIMUM OCCUPANT LOAD
A, B, E ^a , F, M, U	49
H-1, H-2, H-3	3
H-4, H-5, I-1, I-3, I-4, R	10
S	29

a. Day care maximum occupant load is 10.

Reason: This proposal is intended to follow up on Item E136-06/07 of the previous code development cycle. The City of Portland, Oregon, proponents of that submittal, correctly identified shortcomings in the 2006 Table 1019.2. The Means of Egress Code Development Committee and the membership agreed as the item was approved and appears in the 2007 Supplement. As much as the code change represents a significant improvement, specific details remain unaddressed. The City of Seattle frequently encounters single exit designs and we feel that too much is presently left to interpretation. This proposal primarily adds explanatory language to the section text. It is felt that this more detailed verbiage is necessary to provide clarity and lend to uniformity in application of single exit provisions. An indication that this is necessary is offered in the 2006 International Building Code, Code and Commentary, Volume 1. That document makes two statements of questionable technical merit or history. For example, it states, “Also, this section assumes single occupancy buildings. The use of these provisions for mixed occupancies is subject to approval by the building official.” Section 1019.1 or 1019.2 do not make that distinction and previous editions of the commentary have not either. The 2006 Commentary also states, “It is important to note that the provisions in Section 1019.2 apply to entire buildings only, not individual stories or fire areas.” This statement has obviously been nullified by the 2007 Supplement.

The reformatting of Table 1019.2 in the 2007 Supplement goes a long way in implying the purpose of the table. That is, to indicate the combination of variables under which a given occupancy may be served by a single exit. It is felt that these provisions are intended to be used in combination based on their individual merit. For example, a building of any height where the remainder of the building is served by two or more exits may have a Group M occupancy at the second story of the building so long as that occupancy has an occupant load of not more than 29 persons and the travel distance does not exceed 75 feet. This obviously assumes no cumulative occupant loads as regulated by Section 1004.1. Should one occupancy egress through another occupancy, the cumulative occupant load and applicable travel distance would serve as entry values for Table 1019.2. Additionally, the same building could have a Group A occupancy at the first story of the building provided that the occupant load and the travel distance did not exceed 49 occupants and 75 feet, respectively.

Section 1001.1 fundamentally requires that, “Buildings or portions thereof shall be provided with a means of egress system as required by this chapter. The provisions of this chapter shall control the design, construction and arrangement of means of egress components required to provide an approved means of egress from structures and portions thereof.” Clearly, means of egress provisions apply to the “portions served” and may be designed independently of other “portions served” within a given building. The proposed second sentence of Section 1019.2 makes this distinction. This portion-by-portion philosophy also potentially applies to mixed occupancies so long as the individual occupancies do not exceed the limitations for those occupancies as delineated in Table 1019.2. The Boeing Company has been instrumental in the development of current IBC mixed occupancy requirements. They share our concern about the vagueness of single exit provisions and are co-proponents of this proposal. Boeing noted that the perceived limitation of mixed occupancies in individual story applications could also be applied to individual spaces given the similarity of threshold requirements in Section 1015.1. Accordingly, that section has also been modified to clarify mixed occupancy requirements. Additionally, the title of Table 1015.1 has been altered to agree with the title of the section and the text in Section 1015.1.

Lastly, and to support a position stated in the 2006 Commentary, the last sentence of Section 1019.2 stipulates that single exit basement applications are limited to the first story below grade plane. To be consistent with the allowance for single exit basements, the column heading in Table 1019.2 has been changed to acknowledge that the story could be above or below grade plane (basement).

In summary, this proposal provides needed amplification of single exit provisions from various stories within a building. It provides necessary guidance for designers and code enforcement officials alike and will lend to more uniform and appropriate interpretations of this important concept.

Cost Impact: The code proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:**Approved as Submitted****Committee Reason:** The proposal adds consistency and clarifies the provisions for single exit buildings as provided in the 2007 Supplement.**Assembly Action:****None**

Final Hearing Results

E127-07/08

AS

Code Change No: E129-07/08

Original Proposal

Sections: 1020.1 (IFC [B] 1020.1)**Proponent:** Jay Wallace, The Boeing Company**Revise as follows:**

1020.1 (IFC [B] 1020.1) (Supp) Enclosures required. Interior exit stairways and interior exit ramps shall be enclosed with fire barriers constructed in accordance with Section 706 or horizontal assemblies constructed in accordance with Section 711, or both. Exit enclosures shall have a fire-resistance rating of not less than 2 hours where connecting four stories or more and not less than 1 hour where connecting less than four stories. The number of stories connected by the exit enclosure shall include any basements but not any mezzanines. Exit enclosures shall have a fire-resistance rating not less than the floor assembly penetrated, but need not exceed 2 hours. Exit enclosures shall lead directly to the exterior of the building or shall be extended to the exterior of the building with an exit passageway conforming to the requirements of Section 1021, except as permitted in Section 1024.1. An exit enclosure shall not be used for any purpose other than means of egress.

Exceptions:

1. In all occupancies, other than Group H and I occupancies, a stairway is not required to be enclosed when the stairway serves an occupant load of less than 10 and the stairway complies with either Item 1.1 or 1.2. In all cases, the maximum number of connecting open stories shall not exceed two.
 - 1.1. The stairway is open to not more than one story above the story at the level of exit discharge; or
 - 1.2. The stairway is open to not more than one story below the story at the level of exit discharge.
2. Exits in buildings of Group A-5 where all portions of the means of egress are essentially open to the outside need not be enclosed.
3. Stairways serving and contained within a single residential dwelling unit or sleeping unit in Group R-1, R-2 or R-3 occupancies are not required to be enclosed.
4. Stairways in open parking structures that serve only the parking structure are not required to be enclosed.
5. Stairways in Group I-3 occupancies, as provided for in Section 408.3.6, are not required to be enclosed.
6. Means of egress stairways as required by Section 410.5.3 are not required to be enclosed.
7. Means of egress stairways from balconies, galleries and press boxes as provided for in Section 1025.5.1, are not required to be enclosed.

Reason: This proposal is intended to clarify a fundamental means of egress provision. The relationship between vertical exit enclosures and exit passageways is an extremely important one for the maintenance of egress continuity and yet, the code does not specifically state the requirement. Section 1024.1 states, "Exits shall discharge directly to the exterior of the building." Section 1019.3 states, "Exits shall be continuous from the point of entry into the exit to the exit discharge." Section 1019.1 states, "Once a given level of exit protection is achieved, such level of protection shall not be reduced until arrival at the exit discharge." Section 1020.1.1 states, "Where interior exit enclosures are extended to the exterior of a building by an exit passageway..." Section 1021.3 states, "Exit passageway enclosures shall have ... fire-resistance rating, and not less than that required for any connecting exit enclosure." This collection of requirements obviously implies the

extension of exit enclosures to the exterior of the building by means of an exit passageway; however, Section 1020.1 Enclosures required, does not make the direct statement of this important egress provision. The added sentence also references the exceptions to the exit (enclosure) leading directly to the exterior. These exceptions arguably belong in Section 1018 or 1020; however, given their present location in Section 1024.1, a cross-reference is appropriate and will assist users who may not know to look in the exit discharge section for this information. The proposed revision will assist code users by clearly stating this fundamental egress requirement.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The proposed language will clarify a vague area of the code by indicating that the exit or exit passageway must connect to the outside.

Assembly Action:

None

Final Hearing Results

E129-07/08

AS

Code Change No: E130-07/08

Original Proposal

Sections: 706.7, 1020.1.1 (IFC [B] 1020.1.1), 1020.1.6 (IFC [B] 1020.1.6), 1020.1.7 (IFC [B] 1020.1.7), 1020.1.7.1 (IFC [B] 1020.1.7.1), 1020.2 (New) (IFC [B] 1020.2 (New)), 1020.2.1 (New) (IFC [B] 1020.2.1 (New)), 1021.3 (IFC [B] 1021.3), 1021.4 (IFC [B] 1021.4)

Proponent: Philip Brazil, PE, Reid Middleton, Inc., representing himself

1. Revise as follows:

706.7 (Supp) Openings. Openings in a fire barrier shall be protected in accordance with Section 715. Openings shall be limited to a maximum aggregate width of 25 percent of the length of the wall, and the maximum area of any single opening shall not exceed 156 square feet (15 m²). Openings in exit enclosures and exit passageways shall also comply with Sections 1020.1.1 and 1021.4, respectively.

Exceptions:

1. Openings shall not be limited to 156 square feet (15 m²) where adjoining floor areas are equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.
2. Openings shall not be limited to 156 square feet (15 m²) or an aggregate width of 25 percent of the length of the wall where the opening protective is a fire door serving an exit enclosure.
3. Openings shall not be limited to 156 square feet (15 m²) or an aggregate width of 25 percent of the length of the wall where the opening protective assembly has been tested in accordance with ASTM E 119 or UL 263 and has a minimum fire-resistance rating not less than the fire-resistance rating of the wall.
4. Fire window assemblies permitted in atrium separation walls shall not be limited to a maximum aggregate width of 25 percent of length of the wall.
5. Openings shall not be limited to 156 square feet (15m²) or an aggregate width of 25 percent of the length of the wall where the opening protective is a fire door assembly in a fire barrier separating an exit enclosure from an exit passageway in accordance with Section 1020.2.1.

2. Add new text as follows:

1020.2 (IFC [B] 1020.2) Termination. Exit enclosures shall terminate at an exit discharge or a public way.

Exception: An exit enclosure shall be permitted to terminate at an exit passageway complying with Section 1021 provided the exit passageway terminates at an exit discharge or a public way.

1020.2.1 (IFC [B] 1020.2.1) Extension. Where an exit enclosure is extended to an exit discharge or a public way by an exit passageway, the exit enclosure shall be separated from the exit passageway by a fire barrier constructed in accordance with Section 706 or a horizontal assembly constructed in accordance with Section 711, or both. The fire-resistance rating shall be at least equal to that required for the exit enclosure. A fire door assembly complying with Section 715.4 shall be installed in the fire barrier to provide a means of egress from the exit enclosure to the exit passageway. Openings in the fire barrier other than the fire door assembly are prohibited. Penetrations of the fire barrier are prohibited.

Exception: Penetrations of the fire barrier in accordance with Section 1020.4 shall be permitted.

3. Revise as follows:

1020.1.1 (IFC [B] 1020.1.1) 1020.3 (IFC [B] 1020.3) Openings and penetrations. Exit enclosure opening protectives shall be in accordance with the requirements of Section 715.

Except as permitted in Section 402.4.6, openings in exit enclosures other than unprotected exterior openings shall be limited to those necessary for exit access to the enclosure from normally occupied spaces and for egress from the enclosure.

~~Where interior exit enclosures are extended to the exterior of a building by an exit passageway, the door assembly from the exit enclosure to the exit passageway shall be protected by a fire door assembly conforming to the requirements in Section 715.4. Fire door assemblies in exit enclosures shall comply with Section 715.4.4.~~

Elevators shall not open into an exit enclosure.

(Renumber Sections 1020.1.2 through 1020.1.5 as Sections 1020.4 through 1020.7)

1020.1.6 (IFC [B] 1020.1.6) 1020.8 (IFC [B] 1020.8) (Supp) Floor identification signs. A sign shall be provided at each floor landing in interior exit enclosures connecting more than three stories designating the floor level, the terminus of the top and bottom of the exit enclosure and the identification of the stair or ramp. The signage shall also state the story of, and the direction to the exit discharge and the availability of roof access from the enclosure for the fire department. The sign shall be located 5 feet (1524 mm) above the floor landing in a position that is readily visible when the doors are in the open and closed positions. Floor level identification signs in tactile characters complying with ICC A117.1 shall be located at each floor level landing adjacent to the door leading from the enclosure into the corridor to identify the floor level.

1020.1.7 (IFC [B] 1020.1.7) 1020.9 (IFC [B] 1020.9) Smokeproof enclosures and pressurized stairways. In buildings required to comply with Section 403 or 405, each of the exits of a building that serves stories where the floor surface is located more than 75 feet (22 860 mm) above the lowest level of fire department vehicle access or more than 30 feet (9144 mm) below the level of exit discharge serving such floor levels shall be a smokeproof enclosure or pressurized stairway in accordance with Section 909.20.

1020.1.7.1 (IFC [B] 1020.1.7.1) 1020.9.1 (IFC [B] 1020.1.9.1) Enclosure exit Termination and extension. A smokeproof enclosure or pressurized stairway shall ~~exit into~~ terminate at an exit discharge or a public way ~~or into an exit passageway, yard, or open space having direct access to a public way.~~ The smokeproof enclosure or pressurized stairway shall be permitted to be extended by an exit passageway in accordance with Section 1020.2. The exit passageway shall be without ~~other~~ openings other than the fire door assembly required by Section 1020.2 and those necessary for egress from the exit passageway. The exit passageway shall be separated from the remainder of the building by 2-hour fire-resistance-rated construction.

Exceptions:

1. Openings in the exit passageway serving a smokeproof enclosure are permitted where the exit passageway is protected and pressurized in the same manner as the smokeproof enclosure, and openings are protected as required for access from other floors.
2. Openings in the exit passageway serving a pressurized stairway are permitted where the exit passageway is protected and pressurized in the same manner as the pressurized stairway.
3. The fire barrier separating the smokeproof enclosure or pressurized stairway from the exit passageway is not required, provided the exit passageway is protected and pressurized in the same manner as the smokeproof enclosure or pressurized stairway.
4. A smoke proof enclosure or pressurized stairway shall be permitted to egress through areas on the level of discharge or vestibules as permitted by Section 1024.

(Renumber Section 1020.1.7.2 as Section 1020.9.2)

1021.3 (IFC [B] 1021.3) [Supp] Construction. Exit passageway enclosures shall have walls, floors and ceilings of not less than 1-hour fire-resistance rating, and not less than that required for any connecting exit enclosure. Exit passageways shall be constructed as fire barriers in accordance with Section 706 or horizontal assemblies constructed in accordance with Section 711, or both.

1021.4 (IFC [B] 1020.4) Termination. Exit passageways shall terminate at an exit discharge or a public way.

1021.4 (IFC [B] 1021.4) 1021.5 (IFC [B] 1021.5) Openings and penetrations. Exit passageway opening protectives shall be in accordance with the requirements of Section 715.

Except as permitted in Section 402.4.6, openings in exit passageways other than ~~unexposed unprotected~~ exterior openings shall be limited to those necessary for exit access to the exit passageway from normally occupied spaces and for egress from the exit passageway.

Where ~~interior~~ an exit enclosure ~~is~~ extended to the exterior of a building ~~an exit discharge or a public way~~ by an exit passageway, ~~the door assembly from the exit enclosure to the exit passageway shall be protected by a fire door conforming to the requirements in Section 715.4. Fire door assemblies in exit passageways shall also comply with Section 715.4.4 1020.2.1.~~

Elevators shall not open into an exit passageway.

(Rename Section 1021.5 as Section 1021.6)

Reason: The purpose of this proposal is to establish a technical basis for the option of extending an exit enclosure to an exit discharge or a public way by means of an exit passageway. It was prepared in conjunction with related proposals on editorial revisions to the provisions for exit enclosures and exit passageways, definitions of the means of egress components, and the technical provisions for smokeproof enclosures and pressurized stairways. Currently, there is no charging language permitting such an option, only references to the option in the third paragraphs of Sections 1020.1.1 and 1021.4 (Sections 1020.3 and 1021.5 in proposal). These paragraphs, in turn, reference a door assembly from the exit enclosure to the exit passageway and require it to be a fire door assembly, but there is no charging language requiring the door assembly. The paragraphs are also silent on what surrounds the door assembly, which is typically a wall or partition. Section 1002.1 defines “exit enclosure” and “exit passageway” as providing egress travel “to the exit discharge or the public way” but there is no charging language requiring such travel other than in the definitions, which should not be relied upon for providing technical requirements.

The references to a door assembly from the exit enclosure to the exit passageway have caused confusion when the exit passageway is used in conjunction with a smokeproof enclosure or a pressurized stairway. Requiring separation of the exit enclosure from the exit passageway with a fire barrier, where the passageway is used to extend an exit enclosure to an exit discharge or public way, typically has merit. The exit passageway is permitted by Section 1021.4 (Section 1021.5 in proposal) to have openings from rooms adjacent to the exit passageway provided they are limited to those necessary for exit access to the exit passageway from normally occupied spaces. A fire in one of these rooms could compromise the use of the exit passageway as a component of the means of egress. The fire barrier reduces the possibility of the connecting exit enclosure also being compromised, thus, preserving its function for other floor levels.

When the exit passageway is used in conjunction with a smokeproof enclosure or a pressurized stairway, however, the fire barrier could be detrimental to the operation of the mechanical system providing pressurization where the mechanical ventilation alternative of Section 909.20.4 is utilized. The fire barrier is also superfluous since Section 1020.1.7.1 (Section 1020.9.1 in proposal) prohibits openings into such exit passageways, thus, eliminating the hazard posed by openings from adjacent rooms to the passageway.

The proposal accomplishes the following: [code sections noted in ()]

1. Provides charging language requiring exit enclosures to terminate at an exit discharge or a public way. (1020.2)
2. Provides charging language permitting the option of using an exit passageway to extend an exit enclosure to an exit discharge or a public way. (1020.2, Exception)
3. Requires separation of the exit enclosure from the exit passageway by means of a fire barrier when the option of using an exit passageway to extend an exit enclosure is utilized. (1020.2.1)
4. Specifies requirements for the fire barrier that are equivalent to that of the connecting exit enclosure. (1020.2.1)
5. Adds an exception to Section 706.7 for the fire barrier consistent with Exception #2. (706.7, Exception 5)
6. Provides charging language requiring smokeproof enclosures and pressurized stairways to terminate at an exit discharge or a public way, and permitting the option of using an exit passageway to extend the smokeproof enclosure or pressurized stairway to an exit discharge or a public way in the same manner as for exit enclosures. (1020.9.1)
7. Revises the language on openings into an exit passageway used to extend a smokeproof enclosure or pressurized stairway by prohibiting them except for the fire door assembly in the fire barrier separating the smokeproof enclosure or pressurized stairway from the exit passageway and those necessary for egress from the exit passageway in conjunction with similar language in the second paragraph of Section 1021.4 (Section 1021.5 in proposal) on openings in exit passageways. (1020.9.1)
8. Provides an exception to the requirement for separation of the smokeproof enclosure or pressurized stairway from the exit passageway by means of a fire barrier when the exit passageway is protected and pressurized in the same manner as the smokeproof enclosure or pressurized stairway. (1020.9.1, Exception 3)
9. Provides charging language requiring exit passageways to terminate at an exit discharge or a public way. (1021.4)
10. Provides charging language permitting the option of using an exit passageway to extend an exit enclosure to an exit discharge or a public way in conjunction with Item #2 above. (1021.5, paragraph #3)

In proposed Section 1020.2.1, “interior exit enclosures,” currently in the third paragraph of Section 1020.1.1, is changed to “exit enclosures” because “interior” is judged to be superfluous. All exit enclosures are interior enclosures including those with exterior walls (refer to current Section 1020.1.4). Note that Section 1002.1 defines an “interior stairway” as a “stairway not meeting the definition of exterior stairway.” The same change is proposed in Sections 1020.1.6 and 1021.4 (Sections 1020.8 and 1021.5 in proposal), which represent the only other instances of “interior exit enclosure” in the 2006 IBC.

In proposed Section 1020.2.1, “exterior of a building,” currently in the third paragraph of Section 1020.1.1, is changed to “exit discharge” for consistency with the definitions in Section 1002.1 of “exit enclosure”, which is defined as providing a protected path of egress travel to the exit discharge or the public way, and “exit,” which is defined as providing a protected path of egress travel between the exit access and the exit discharge. It is also changed for consistency with Section 1024.1, which requires exits to discharge directly to the exterior of the building (with exceptions).

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:**Approved as Submitted**

Committee Reason: The proposed language would clarify the intent of exit and exit discharge. This fills voids in the current text regarding the connection between the exit enclosure and exit passageway, and what happens where an pressurized stairway discharges to an exit passageway.

Assembly Action:**None**

Final Hearing Results

E130-07/08**AS**
Code Change No: E134-07/08

Original Proposal

Sections: 1020.1.7, 1020.1.7.1 (IFC [B] 1020.1.7, [B] 1020.1.7.1)**Proponent:** Philip Brazil, PE, Reid Middleton, Inc., representing himself**Revise as follows:**

1020.1.7 (IFC [B] 1020.1.7) Smokeproof enclosures. In buildings required to comply with Section 403 or 405, each of the ~~exits of a building that serves stories where the~~ exit enclosures serving a story with a floor surface that is located more than 75 feet (22 860 mm) above the lowest level of fire department vehicle access or more than 30 feet (9144 mm) below the level of exit discharge serving such ~~floor levels~~ stories shall be a smokeproof enclosure or pressurized stairway in accordance with Section 909.20.

1020.1.7.1 (IFC [B] 1020.1.7.1) Enclosure exit. A smokeproof enclosure or pressurized stairway shall exit into a public way or into an exit passageway, yard or open space having direct access to a public way. The exit passageway shall be without other openings and shall be separated from the remainder of the building by 2-hour ~~fire-resistance-rated construction~~ fire barriers constructed in accordance with Section 706 or horizontal assemblies constructed in accordance with Section 711, or both.

Exceptions:

1. Openings in the exit passageway serving a smokeproof enclosure are permitted where the exit passageway is protected and pressurized in the same manner as the smokeproof enclosure, and openings are protected as required for access from other floors.
2. Openings in the exit passageway serving a pressurized stairway are permitted where the exit passageway is protected and pressurized in the same manner as the pressurized stairway.
3. A smokeproof enclosure or pressurized stairway shall be permitted to egress through areas on the level of discharge or vestibules as permitted by Section 1024.

Reason: In Section 1020.1.7, serving "such floor levels" is changed to serving "such stories" for internal consistency within the section where it specifies exits serving a story whose floor surface is located as noted.

In Section 1020.1.7, "exit" is changed to "exit enclosure" for correlation with Section 1020.1 requiring enclosure of all interior exit stairways and interior exit ramps unless exempted. If each exit with a floor surface more than 75 feet above the lowest level of fire department vehicle access or more than 30 feet below the level of exit discharge were required to be a smokeproof enclosure or pressurized stairway, many of the exceptions to the requirement for enclosure in Section 1020.1 would be negated, which is not the intent.

The other proposed changes are editorial. In Section 1020.1.7, exits "of a building that serves stories where the floor surface is located" as noted is changed to exits "serving a story with a floor surface located" as noted. In Section 1020.1.7.1, "fire-resistance-rated construction" at exit passageways is changed to "fire barriers constructed in accordance with Section 706 or horizontal assemblies constructed in accordance with Section 711, or both" for consistency with similar language in Section 1021.3 for exit passageways.

This proposal was prepared in conjunction with related proposals on editorial revisions to the provisions for exit enclosures and exit passageways, definitions of the means of egress components, and exit passageways used to extend exit enclosures to an exit discharge or a public way.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Errata: Modify the proposal as follows.

1020.1.7 (IFC [B]1020.1.7) Smokeproof enclosures. In buildings required to comply with Section 403 or 405, each of the exit enclosures serving a story with a floor surface that is located more than 75 feet (22 860 mm) above the lowest level of fire department vehicle access or more than 30 feet (9144 mm) below the level of exit discharge serving such stories shall be a smokeproof enclosure or pressurized stairway in accordance with Section 909.20.

(Portions of proposal not shown remain unchanged)

Committee Action:

Approved as Submitted

Committee Reason: The proposal offers specific language and references for separation requirements. This coordinates provisions that were started in the 2007 Supplement.

Assembly Action:

None

Final Hearing Results

E134-07/08

AS

Code Change No: E136-07/08

Original Proposal

Sections: 1022.1, 1022.4, (IFC [B] 1022.1, [B] 1022.4)

Proponent: Gregory R. Keith, Professional heuristic Development, representing The Boeing Company

Revise as follows:

1022.1 (IFC [B] 1022.1) Horizontal exits. Horizontal exits serving as an exit in a means of egress system shall comply with the requirements of this section. A horizontal exit shall not serve as the only exit from a portion of a building, and where two or more exits are required, not more than one-half of the total number of exits or total exit width shall be horizontal exits.

Exceptions:

1. Horizontal exits are permitted to comprise two-thirds of the required exits from any building or floor area for occupancies in Group I-2.
2. Horizontal exits are permitted to comprise 100 percent of the exits required for occupancies in Group I-3. At least 6 square feet (0.6 m²) of accessible space per occupant shall be provided on each side of the horizontal exit for the total number of people in adjoining compartments.

~~Every fire compartment for which credit is allowed in connection with a horizontal exit shall not be required to have a stairway or door leading directly outside, provided the adjoining fire compartments have stairways or doors leading directly outside and are so arranged that egress shall not require the occupants to return through the compartment from which egress originates.~~

~~The area into which a horizontal exit leads shall be provided with exits adequate to meet the occupant requirements of this chapter, but not including the added occupant capacity imposed by persons entering it through horizontal exits from other areas. At least one of its exits shall lead directly to the exterior or to an exit enclosure.~~

1022.4 (IFC [B] 1022.4) Capacity of refuge area. The refuge area of a horizontal exit shall be a space occupied by the same tenant or a public area and each such refuge area shall be adequate to accommodate the original occupant load of the refuge area plus the occupant load anticipated from the adjoining compartment. The anticipated occupant load from the adjoining compartment shall be based on the capacity of the horizontal exit doors entering the refuge area. The capacity of the refuge area shall be computed based on a net floor area allowance of 3 square feet (0.2787 m²) for each occupant to be accommodated therein.

Exception: The net floor area allowable per occupant shall be as follows for the indicated occupancies:

1. Six square feet (0.6 m²) per occupant for occupancies in Group I-3.
2. Fifteen square feet (1.4 m²) per occupant for ambulatory occupancies in Group I-2.
3. Thirty square feet (2.8 m²) per occupant for nonambulatory occupancies in Group I-2.

The refuge area into which a horizontal exit leads shall be provided with exits adequate to meet the occupant requirements of this chapter, but not including the added occupant load imposed by persons entering it through horizontal exits from other areas. At least one refuge area exit shall lead directly to the exterior or to an exit enclosure.

Exception: The adjoining compartment shall not be required to have a stairway or door leading directly outside, provided the refuge area into which a horizontal exit leads has stairways or doors leading directly outside and are so arranged that egress shall not require the occupants to return through the compartment from which egress originates.

Reason: This proposal intends to clarify horizontal exit provisions. First, the third paragraph of Section 1022.1 has been relocated to Section 1022.4. That provision deals with the design of the means of egress from the refuge area and is more appropriately located in the latter section. Secondly, the second paragraph of Section 1022.1 currently contains some confusing language referencing a fire compartment credit concept that is not recognized anywhere in Chapter 10. The paragraph has been rewritten in more contemporary language while maintaining the original technical intent. Additionally, based on IBC errata, the provision in question was originally intended to be an exception. Accordingly, it has been retained as an exception; however, it also been placed in context following the proposed second paragraph of Section 1022.4. Approval of this proposal will clarify the intent of the code and assist users in the proper determination of horizontal exit technical requirements.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: An errata has been issued for Section 1022.1, Exception 2. In the 2000 IBC this section had two paragraphs under the exception. The 2003 IBC and 2006 IBC show the second paragraph of Exception 2 moved out as a main section paragraph. There was no code change proposal to relocate this paragraph, therefore, and errata has been issued for the 2003 and 2006 IBC to locate the paragraph starting "Every fire compartment...." as part of Exception 2.

Public Hearing Results

Errata: Replace the proposal with the following:

1022.1, 1022.4, (IFC [B] 1022.1, [B] 1022.4)

Proponent: Gregory R. Keith, Professional heuristic Development, representing The Boeing Company

Revise as follows:

1022.1 (IFC [B] 1022.1) Horizontal exits. Horizontal exits serving as an exit in a means of egress system shall comply with the requirements of this section. A horizontal exit shall not serve as the only exit from a portion of a building, and where two or more exits are required, not more than one-half of the total number of exits or total exit width shall be horizontal exits.

Exceptions:

1. Horizontal exits are permitted to comprise two-thirds of the required exits from any building or floor area for occupancies in Group I-2.
2. Horizontal exits are permitted to comprise 100 percent of the exits required for occupancies in Group I-3. At least 6 square feet (0.6 m²) of accessible space per occupant shall be provided on each side of the horizontal exit for the total number of people in adjoining compartments.

~~Every fire compartment for which credit is allowed in connection with a horizontal exit shall not be required to have a stairway or door leading directly outside, provided the adjoining fire compartments have stairways or doors leading directly outside and are so arranged that egress shall not require the occupants to return through the compartment from which egress originates.~~

~~The area into which a horizontal exit leads shall be provided with exits adequate to meet the occupant requirements of this chapter, but not including the added occupant capacity imposed by persons entering it through horizontal exits from other areas. At least one of its exits shall lead directly to the exterior or to an exit enclosure.~~

1022.4 (IFC [B] 1022.4) Capacity of refuge area. The refuge area of a horizontal exit shall be a space occupied by the same tenant or a public area and each such refuge area shall be adequate to accommodate the original occupant load of the refuge area plus the occupant load anticipated from the adjoining compartment. The anticipated occupant load from the adjoining compartment shall be based on the capacity of the horizontal exit doors entering the refuge area. The capacity of the refuge area shall be computed based on a net floor area allowance of 3 square feet (0.2787 m²) for each occupant to be accommodated therein.

Exception: The net floor area allowable per occupant shall be as follows for the indicated occupancies:

1. Six square feet (0.6 m²) per occupant for occupancies in Group I-3.
2. Fifteen square feet (1.4 m²) per occupant for ambulatory occupancies in Group I-2.
3. Thirty square feet (2.8 m²) per occupant for nonambulatory occupancies in Group I-2.

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The refuge area into which a horizontal exit leads shall be provided with exits adequate to meet the occupant requirements of this chapter, but not including the added occupant load imposed by persons entering it through horizontal exits from other areas. At least one refuge area exit shall lead directly to the exterior or to an exit enclosure.

Exception: The adjoining compartment shall not be required to have a stairway or door leading directly outside, provided the refuge area into which a horizontal exit leads has stairways or doors leading directly outside and are so arranged that egress shall not require the occupants to return through the compartment from which egress originates.

Reason: This proposal intends to clarify horizontal exit provisions. First, the third paragraph of Section 1022.1 has been relocated to Section 1022.4. That provision deals with the design of the means of egress from the refuge area and is more appropriately located in the latter section. Secondly, the second paragraph of Section 1022.1 currently contains some confusing language referencing a fire compartment credit concept that is not recognized anywhere in Chapter 10. The paragraph has been rewritten in more contemporary language while maintaining the original technical intent. Additionally, based on IBC errata, the provision in question was originally intended to be an exception. Accordingly, it has been retained as an exception; however, it also been placed in context following the proposed second paragraph of Section 1022.4. Approval of this proposal will clarify the intent of the code and assist users in the proper determination of horizontal exit technical requirements.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: An errata has been issued for Section 1022.1, Exception 2. In the 2000 IBC this section had two paragraphs under the exception. The 2003 IBC and 2006 IBC show the second paragraph of Exception 2 moved out as a main section paragraph. There was no code change proposal to relocate this paragraph, therefore, and errata has been issued for the 2003 and 2006 IBC to locate the paragraph starting "Every fire compartment...." as part of Exception 2.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The proposal places the language in a better location to improve understanding of what is permitted for horizontal exits.

Assembly Action:

None

Final Hearing Results

E136-07/08

AS

Code Change No: E138-07/08

Original Proposal

Sections: 1022.1, 1022.4, (IFC [B] 1022.1, [B] 1022.4)

Proponent: Gregory R. Keith, Professional heuristic Development, representing The Boeing Company

Revise as follows:

1022.1 (IFC [B] 1022.1) Horizontal exits. Horizontal exits serving as an exit in a means of egress system shall comply with the requirements of this section. A horizontal exit shall not serve as the only exit from a portion of a building, and where two or more exits are required, not more than one-half of the total number of exits or total exit width shall be horizontal exits.

Exceptions:

1. Horizontal exits are permitted to comprise two-thirds of the required exits from any building or floor area for occupancies in Group I-2.
2. Horizontal exits are permitted to comprise 100 percent of the exits required for occupancies in Group I-3. At least 6 square feet (0.6 m²) of accessible space per occupant shall be provided on each side of the horizontal exit for the total number of people in adjoining compartments.

~~Every fire compartment for which credit is allowed in connection with a horizontal exit shall not be required to have a stairway or door leading directly outside, provided the adjoining fire compartments have stairways or doors leading directly outside and are so arranged that egress shall not require the occupants to return through the compartment from which egress originates.~~

~~The area into which a horizontal exit leads shall be provided with exits adequate to meet the occupant requirements of this chapter, but not including the added occupant capacity imposed by persons entering it through horizontal exits from other areas. At least one of its exits shall lead directly to the exterior or to an exit enclosure.~~

1022.4 (IFC [B] 1022.4) Capacity of refuge area. The refuge area of a horizontal exit shall be a space occupied by the same tenant or a public area and each such refuge area shall be adequate to accommodate the original occupant load of the refuge area plus the occupant load anticipated from the adjoining compartment. The anticipated occupant load from the adjoining compartment shall be based on the capacity of the horizontal exit doors entering the refuge area. The capacity of the refuge area shall be computed based on a net floor area allowance of 3 square feet (0.2787 m²) for each occupant to be accommodated therein.

Exception: The net floor area allowable per occupant shall be as follows for the indicated occupancies:

1. Six square feet (0.6 m²) per occupant for occupancies in Group I-3.
2. Fifteen square feet (1.4 m²) per occupant for ambulatory occupancies in Group I-2.
3. Thirty square feet (2.8 m²) per occupant for nonambulatory occupancies in Group I-2.

The refuge area into which a horizontal exit leads shall be provided with exits adequate to meet the occupant requirements of this chapter, but not including the added occupant load imposed by persons entering it through horizontal exits from other areas. At least one refuge area exit shall lead directly to the exterior or to an exit enclosure.

Exception: The adjoining compartment shall not be required to have a stairway or door leading directly outside, provided the refuge area into which a horizontal exit leads has stairways or doors leading directly outside and are so arranged that egress shall not require the occupants to return through the compartment from which egress originates.

Reason: This proposal intends to clarify horizontal exit provisions. First, the third paragraph of Section 1022.1 has been relocated to Section 1022.4. That provision deals with the design of the means of egress from the refuge area and is more appropriately located in the latter section. Secondly, the second paragraph of Section 1022.1 currently contains some confusing language referencing a fire compartment credit concept that is not recognized anywhere in Chapter 10. The paragraph has been rewritten in more contemporary language while maintaining the original technical intent. Additionally, based on IBC errata, the provision in question was originally intended to be an exception. Accordingly, it has been retained as an exception; however, it also been placed in context following the proposed second paragraph of Section 1022.4. Approval of this proposal will clarify the intent of the code and assist users in the proper determination of horizontal exit technical requirements.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: An errata has been issued for Section 1022.1, Exception 2. In the 2000 IBC this section had two paragraphs under the exception. The 2003 IBC and 2006 IBC show the second paragraph of Exception 2 moved out as a main section paragraph. There was no code change proposal to relocate this paragraph, therefore, an errata has been issued for the 2003 and 2006 IBC to locate the paragraph starting "Every fire compartment...." as part of Exception 2.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The proposal places the language in a better location to improve understanding of what is permitted for horizontal exits.

Assembly Action:

None

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment 1:

Lee J. Kranz, City of Bellevue, WA, representing Washington Association of Building Officials Technical Code Development Committee, requests Approval as Modified by this public comment.

Modify proposal as follows:

1024.1 (IFC [B] 1024.1) (Supp) General. Exits shall discharge directly to the exterior of the building. The exit discharge shall be at grade or shall provide direct access to grade. The exit discharge shall not reenter a building. The combined use of Exceptions 1 and 2 below shall not be used concurrently within a building exceed 50% of the number and capacity of the required exits.

Exceptions:

1. A maximum of 50 percent of the number and capacity of the exit enclosures is permitted to egress through areas on the level of discharge provided all of the following are met:
 - 1.1. Such exit enclosures egress to a free and unobstructed way to the exterior of the building, which way is readily visible and identifiable from the point of termination of the exit enclosure.
 - 1.2. The entire area of the level of discharge is separated from areas below by construction conforming to the fire-resistance rating for the exit enclosure.
 - 1.3. The egress path from the exit enclosure on the level of discharge is protected throughout by an approved automatic sprinkler system. All portions of the level of discharge with access to the egress path shall either be protected throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2, or separated from the egress path in accordance with the requirements for the enclosure of exits.
2. A maximum of 50 percent of the number and capacity of the exit enclosures is permitted to egress through a vestibule provided all of the following are met:
 - 2.1. The entire area of the vestibule is separated from areas below by construction conforming to the fire resistance rating for the exit enclosure.
 - 2.2. The depth from the exterior of the building is not greater than 10 feet (3048 mm) and the length is not greater than 30 feet (9144 mm).
 - 2.3. The area is separated from the remainder of the level of exit discharge by construction providing protection at least the equivalent of approved wired glass in steel frames.
 - 2.4. The area is used only for means of egress and exits directly to the outside.
3. Stairways in open parking garages complying with Section 1020.1, Exception 5, are permitted to egress through the open parking garage at the level of exit discharge.
4. Horizontal exits complying with Section 1022 shall not be required to discharge directly to the exterior of the building.

Commenter's Reason: As advised by the Egress Committee in Palm Springs, the language has been modified to make it clear that not more than 50% of the required exit enclosures may utilize exceptions #1 & #2 concurrently. This is necessary as there will be cases where more than 2 exit enclosures are required and the revised language resolves the issue.

Final Hearing Results

E138-07/08

AMPC1

Code Change No: E140-07/08

Original Proposal

Sections: 1024.1, (IFC [B] 1024.1)

Proponent: Jay Wallace, The Boeing Company

Revise as follows:

1024.1 (IFC [B] 1024.1) (Supp) General. Exits shall discharge directly to the exterior of the building. The exit discharge shall be at grade or shall provide direct access to grade. The exit discharge shall not reenter a building.

Exceptions:

1. A maximum of 50 percent of the number and capacity of the exit enclosures is permitted to egress through areas on the level of discharge provided all of the following are met:
 - 1.1. Such exit enclosures egress to a free and unobstructed path of travel way to an exit at the exterior of the building, ~~which way and such exit~~ is readily visible and identifiable from the point of termination of the exit enclosure.
 - 1.2. The entire area of the level of discharge is separated from areas below by construction conforming to the fire-resistance rating for the exit enclosure.

- 1.3. The egress path from the exit enclosure on the level of discharge is protected throughout by an approved automatic sprinkler system. All portions of the level of discharge with access to the egress path shall either be protected throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2, or separated from the egress path in accordance with the requirements for the enclosure of exits.
2. A maximum of 50 percent of the number and capacity of the exit enclosures is permitted to egress through a vestibule provided all of the following are met:
 - 2.1. The entire area of the vestibule is separated from areas below by construction conforming to the fire resistance rating for the exit enclosure.
 - 2.2. The depth from the exterior of the building is not greater than 10 feet (3048 mm) and the length is not greater than 30 feet (9144 mm).
 - 2.3. The area is separated from the remainder of the level of exit discharge by construction providing protection at least the equivalent of approved wired glass in steel frames.
 - 2.4. The area is used only for means of egress and exits directly to the outside.
3. Stairways in open parking garages complying with Section 1020.1, Exception 5, are permitted to egress through the open parking garage at the level of exit discharge.
4. Horizontal exits complying with Section 1022 shall not be required to discharge directly to the exterior of the building.

Reason: Exception 1 allows egress through areas along the way to the exterior of the building but those areas are not well defined. As written, it could be interpreted to allow for a free and unobstructed way that winds through various areas on the level of discharge as long as the way is readily visible and identifiable. The intent of the exception is to allow for egress along a path of travel which leads directly to an exit at the exterior of the building that can be seen from the door of the exit enclosure. This revision clarifies that the exit door to the exterior of the building must be visible upon egress from the exit enclosure which is how this section is being interpreted in most jurisdictions today.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The proposed language clarifies that the exit signage is not enough in the lobby used for exit discharge. The exit door must be visible from the bottom of the exit stair.

Assembly Action:

None

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because public comments were submitted.

Public Comment 1:

Lori Lee Graham, City of Portland, OR, representing herself, requests Approval as Modified by this public comment.

Modify proposal as follows:

1024.1 (IFC [B] 1024.1) (Supp) General. Exits shall discharge directly to the exterior of the building. The exit discharge shall be at grade or shall provide direct access to grade. The exit discharge shall not reenter a building.

Exceptions:

1. A maximum of 50 percent of the number and capacity of the exit enclosures is permitted to egress through areas on the level of discharge provided all of the following are met:
 - 1.1. Such exit enclosures egress to a free and unobstructed path of travel to an exterior exit door ~~at the exterior of the building~~ and such exit is readily visible and identifiable from the point of termination of the exit enclosure.
 - 1.2. The entire area of the level of discharge is separated from areas below by construction conforming to the fire-resistance rating for the exit enclosure.
 - 1.3. The egress path from the exit enclosure on the level of discharge is protected throughout by an approved automatic sprinkler system. All portions of the level of discharge with access to the egress path shall either be protected throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2, or separated from the egress path in accordance with the requirements for the enclosure of exits.
2. A maximum of 50 percent of the number and capacity of the exit enclosures is permitted to egress through a vestibule provided all of the following are met:
 - 2.1. The entire area of the vestibule is separated from areas below by construction conforming to the fire resistance rating for the exit enclosure.

- 2.2. The depth from the exterior of the building is not greater than 10 feet (3048 mm) and the length is not greater than 30 feet (9144 mm).
- 2.3. The area is separated from the remainder of the level of exit discharge by construction providing protection at least the equivalent of approved wired glass in steel frames.
- 2.4. The area is used only for means of egress and exits directly to the outside.
3. Stairways in open parking garages complying with Section 1020.1, Exception 5, are permitted to egress through the open parking garage at the level of exit discharge.
4. Horizontal exits complying with Section 1022 shall not be required to discharge directly to the exterior of the building.

Commenter's Reason: The proposal as approved by the committee has a flaw in that it requires an unobstructed path to an "exit" at the exterior of the building. Since the definition of exit includes 6 different things, this exit could be another exit enclosure (vertical) or an exit passageway, or an exterior exit stairway. We believe the intent of the proponent and of the original code is that this is specifically an exterior exit door.

Final Hearing Results

E140-07/08

AMPC1

Code Change No: E141-07/08

Original Proposal

Sections: 1025.1.1, (IFC [B] 1025.1.1)

Proponent: Gerard Hathaway, New York State Department of State Building Codes Division, representing ICC 300 Development Committee

Revise as follows:

1025.1.1 (IFC [B] 1025.1.1) Bleachers. Bleachers, grandstands, and folding and telescopic seating, that are not building elements, shall comply with ICC 300.

Reason: Bleachers, Grandstands and Folding and Telescopic Seating are addressed in ICC 300. The purpose of the proposed scoping change is to clarify that bleachers, grandstands and folding and telescopic seating are limited to items that are separate, independent structures from the buildings. They may be located within buildings or combined with spaces constructed under or over (e.g. concessions booths, toilets, roofs). The ICC 300 addresses specifics for the listed types of seating only. The ICC 300 is not intended to be utilized for single row seating that is supported directly on the floor system.

Note that 'building element' is a defined term that was added to the code by FS04-06/07.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The inclusion of the term "not a building element" clarifies that bleachers and grandstands are not part of a floor system. Therefore, where ICC 300 *Bleachers, Grandstands and Folding and Telescopic Seating* should be used is also clarified.

Assembly Action:

None

Final Hearing Results

E141-07/08

AS

Code Change No: E144-07/08

Original Proposal

Sections: 1002.1 (IFC [B] 1002.1)

Proponent: Bob Eugene, Underwriters Laboratories Inc.

Add new definitions as follows:

1002.1 (IFC [B] 1002.1) Definitions. The following words and terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

PHOTOLUMINESCENT. Having the property of emitting light that continues for a length of time after excitation by visible or invisible light has been removed.

SELF-LUMINOUS. Illuminated by a self-contained power source, other than batteries, and operated independently of external power sources.

Reason: These terms are used in 2007 Supplement, Section 1011.4 and 1027.1.6. They should be defined for the user to better understand the differences between the two technologies.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The definitions are consistent with the referenced standards in Section 1027 in the 2007 Supplement. The definition is generic enough to allow for other technologies that were brought up during the floor testimony. Having it as a guide is helpful to users of the code.

Assembly Action:

None

Final Hearing Results

E144-07/08

AS

Code Change No: E145-07/08

Original Proposal

Sections: 1027.1.1, 1027.1.3, 1027.1.4, 1027.6, 1027.6.1 (New), 1027.6.2 (New) [IFC [B] 1027.1.1, [B] 1027.1.3, [B] 1027.1.4, [B] 1027.6, [B] 1027.6.1 (New), [B] 1027.6.2 (New)]

Proponent: Bob Eugene, Underwriters Laboratories Inc.

Revise as follows:

**SECTION 1027 (Supp)
EXIT PATH MARKINGS**

1027.1 (IFC [B] 1027.1) (Supp) General. Approved luminous markings delineating the exit path shall be provided in exit enclosures, including vertical exit enclosures and exit passageways, of buildings of Group A, B, E, I, M, and R-1 having occupied floors located more than 75 feet (22 860 mm) above the lowest level of fire department vehicle access and shall comply with Sections 1027.1.1 through 1027.1.7.

Exception: Exit path markings shall not be required in lobbies or areas of open parking garages, where such lobby or area is located on the level of exit discharge and complies with the exception to Section 1023.1.

1027.1.1 (IFC [B] 1027.1.1) (Supp) Steps. A stripe shall be applied to the horizontal leading edge of each step and shall extend for the full length of the step. Outlining stripes shall have a minimum horizontal width of 1 inch (25 mm) and a maximum width of 2 inches (51 mm). The leading edge of the stripe shall be placed at a maximum of ½ inch (13 mm) from the leading edge of the step and the stripe shall not overlap the leading edge of the step by not more than ½ inch (13 mm) down the vertical face of the step.

Exception: The minimum width of 1 inch (25 mm) shall not apply to outlining stripes listed in accordance with UL1994.

1027.1.2 (IFC [B] 1027.1.2) (Supp) Landings: The leading edge of landings shall be marked with a stripe consistent with the dimensional requirements for steps.

1027.1.3 (IFC [B] 1027.1.3) Handrails: All handrails and handrail extensions shall be marked with a stripe having a minimum width of 1 inch (25 mm). The stripe shall be placed on the top surface of the handrail for the entire length of the handrail, including extensions and newel post caps. Where handrails or handrail extensions bend or turn corners, the stripe shall not have a gap of more than 4 inches (102 mm).

Exception: The minimum width of 1 inch (25 mm) shall not apply to handrail stripes listed in accordance with UL1994.

1027.1.4 (IFC [B] 1027.1.4) (Supp) Perimeter demarcation lines: Stair landings and other floor areas within exit enclosures, with the exception of the sides of steps, shall be provided with demarcation lines on the floor or on the walls or a combination of both. The stripes shall be 1 (25 mm) to 2 inches (51 mm) wide with interruptions not exceeding 4 inches (102 mm).

Exception: The minimum width of 1 inch (25 mm) shall not apply to outlining stripes listed in accordance with UL1994.

1027.1.4.1 (IFC [B] 1027.1.4.1) (Supp) Floor mounted demarcation lines: Perimeter demarcation lines shall be placed within 4 inches of the wall and shall extend to within 2 inches (51 mm) of the markings on the leading edge of landings. The demarcation lines shall continue across the floor in front of all doors.

Exception: Demarcation lines shall not extend in front of exit doors that lead out of an exit enclosure and through which occupants must travel to complete the exit path.

1027.1.4.2 (IFC [B] 1027.1.4.2) (Supp) Wall mounted demarcation lines: Perimeter demarcation lines shall be placed on the wall with the bottom edge of the stripe no more than 4 inches (102 mm) above the finished floor. At the top or bottom of the stairs, demarcation lines shall drop vertically to the floor within 2 inches (51 mm) of the step or landing edge.

Demarcation lines on walls shall transition vertically to the floor and then extend across the floor where a line on the floor is the only practical method of outlining the path. Where the wall line is broken by a door, demarcation lines on walls shall continue across the face of the door or transition to the floor and extend across the floor in front of such doors.

Exception: Demarcation lines shall not extend in front of exit doors that lead out of an exit enclosure and through which occupants must travel to complete the exit path.

1027.1.4.3 (IFC [B] 1027.1.4.3) (Supp) Transition. Where a wall mounted demarcation line transitions to a floor mounted demarcation line, or vice-versa, the wall mounted demarcation line shall drop vertically to the floor to meet a complimentary extension of the floor mounted demarcation line, thus forming a continuous marking.

1027.1.5 (IFC [B] 1027.1.5) (Supp) Uniformity. Placement and dimensions of markings shall be consistent and uniform throughout the same exit enclosure.

1027.1.6 (IFC [B] 1027.1.6) (Supp) Materials. Materials shall comply with Section 1027.16.1 or 1027.1.6.2

1027.1.6.1 (IFC [B] 1027.1.6.1) Self-luminous and photoluminescent. Luminescent exit path markings shall be permitted to be made of any material, including paint, provided that an electrical charge is not required to maintain the required luminance. Such materials shall include, but not limited to, self-luminous materials and photoluminescent materials. Materials shall comply with either:

1. UL 1994, or
2. ASTM E 2072, except that the charging source shall be 1 foot candles (11 lux) of fluorescent illumination for 60 minutes, and the minimum luminance shall be 5 milicandelas per square meter after 90 minutes.

1027.1.6.2 (IFC [B] 1027.1.6.2) Externally powered. Externally powered exit path markings shall be listed in accordance with UL 1994.

1027.1.7 (IFC [B] 1027.1.7) Illumination. Exit enclosures where photoluminescent exit path markings are installed shall be provided with the minimum means of egress illumination required by Section 1006 for at least 60 minutes prior to periods when the building is occupied.

Reason: The minimum width requirement for an outline stripe is intended to ensure that the stripe, when installed, is sufficiently visible. For a stripe Listed per UL 1994, the visibility performance is determined using the actual width of the assembled product (UL 1994 does not accommodate field-applied paints), so there is no need to subsequently specify the minimum width in the installation code. This is not the case for paints or other raw materials that could be claimed to comply with ASTM E2072, which instead relies upon a field performance test. The proposed changes allow those products that have been performance tested and are manufactured in a closely controlled environment to be utilized in accordance with listing requirements.

Additionally, externally illuminated exit path markings should also be recognized for use where the external power source is sufficient to provide 90 minutes of power and the systems conform to the performance test of the adopted standard. This performance criterion is integral to the UL 1994 Listing program.

Cost Impact: The code change proposal will not increase the cost of the construction.

Public Hearing Results

Committee Action:

Approved as Modified

Modify the proposal as follows:

1027.1.6 (IFC [B] 1027.1.6) (Supp) Materials. ~~Materials shall comply with Section 1027.16.1 or 1027.1.6.2~~

~~**1027.1.6.1 (IFC [B] 1027.1.6.1) Self-luminous and photoluminescent.** Luminescent exit path markings shall be permitted to be made of any material, including paint, provided that an electrical charge is not required to maintain the required luminance. Such materials shall include, but not limited to, self-luminous materials and photoluminescent materials. Materials shall comply with either:~~

1. UL 1994, or
2. ASTM E 2072, except that the charging source shall be 1 foot candles (11 lux) of fluorescent illumination for 60 minutes, and the minimum luminance shall be 5 milicandelas per square meter after 90 minutes.

~~**1027.1.6.2 (IFC [B] 1027.1.6.2) Externally powered.** Externally powered exit path markings shall be listed in accordance with UL 1994.~~

(Portions of proposal not shown remain unchanged)

Committee Reason: The proponent requested the modification because 'externally powered' is not under the purview of UL 1994. The proposal was approved because it would allow a different performance based requirement for photoluminescent materials. There were some concerns expressed regarding UL 1994 and if it is going to provide the same level of photoluminescence in the same conditions, specifically to handrails in turnings and transitions.

Assembly Action:

None

Final Hearing Results

E145-07/08

AM

Code Change No: **E146-07/08**

Original Proposal

Sections: 403.16, 1027.1, 1027.1.1, 1027.1.3, 1027.1.4, 1027.1.6 (IFC [B] 1027.1, [B] 1027.1.1, [B] 1027.1.3, [B] 1027.1.4, [B] 1027.1.6)

Proponent: James P. Colgate, RA, Esq, City of New York, Department of Buildings

Revise as follows:

403.16 (Supp) Exit Luminous egress path markings. ~~Exit Luminous egress~~ path markings shall be provided in accordance with Section 1027.

SECTION 1027
EXIT LUMINOUS EGRESS PATH MARKINGS

1027.1 (IFC [B] 1027.1) (Supp) General. Approved luminous egress path markings delineating the exit path shall be provided in exit enclosures, including vertical exit enclosures and exit passageways, of buildings of Group A, B, E, I, M, and R-1 having occupied floors located more than 75 feet (22 860 mm) above the lowest level of fire department vehicle access and shall comply with Sections 1027.1.1 through 1027.1.7.

Exceptions:

1. ~~Exit Luminous egress~~ path markings shall not be required on the level of exit discharge in lobbies or areas of open parking garages, where such lobby or area is located on the level of exit discharge and complies with the exception to that serve as part of the exit path in accordance with Section 4023.4 1024.1, Exception 1.
2. Luminous egress path markings shall not be required in areas of open parking garages that serve as part of the exit path in accordance with Section 1024.1, Exception 3.

1027.1.1 (IFC [B] 1027.1.1) (Supp) Steps. A solid and continuous stripe shall be applied to the horizontal leading edge of each step and shall extend for the full length of the step. Outlining stripes shall have a minimum horizontal width of 1 inch (25 mm) and a maximum width of 2 inches (51 mm). The leading edge of the stripe shall be placed at a maximum of ½ inch (13 mm) from the leading edge of the step and the stripe shall not overlap the leading edge of the step by not more than ½ inch (13 mm) down the vertical face of the step.

1027.1.2 (IFC [B] 1027.1.2) (Supp) Landings: The leading edge of landings shall be marked with a stripe consistent with the dimensional requirements for steps.

1027.1.3 (IFC [B] 1027.1.3) (Supp) Handrails: All handrails and handrail extensions shall be marked with a solid and continuous stripe having a minimum width of 1 inch (25 mm). The stripe shall be placed on the top surface of the handrail for the entire length of the handrail, including extensions and newel post caps. Where handrails or handrail extensions bend or turn corners, the stripe shall not have a gap of more than 4 inches (102 mm).

1027.1.4 (IFC [B] 1027.1.4) (Supp) Perimeter demarcation lines: Stair landings and other floor areas within exit enclosures, with the exception of the sides of steps, shall be provided with solid and continuous demarcation lines on the floor or on the walls or a combination of both. The stripes shall be 1 (25 mm) to 2 inches (51 mm) wide with interruptions not exceeding 4 inches (102 mm).

1027.1.4.1 (IFC [B] 1027.1.4.1) (Supp) Floor mounted demarcation lines: Perimeter demarcation lines shall be placed within 4 inches of the wall and shall extend to within 2 inches (51 mm) of the markings on the leading edge of landings. The demarcation lines shall continue across the floor in front of all doors.

Exception: Demarcation lines shall not extend in front of exit doors that lead out of an exit enclosure and through which occupants must travel to complete the exit path.

1027.1.4.2 (IFC [B] 1027.1.4.2) (Supp) Wall mounted demarcation lines: Perimeter demarcation lines shall be placed on the wall with the bottom edge of the stripe no more than 4 inches (102 mm) above the finished floor. At the top or bottom of the stairs, demarcation lines shall drop vertically to the floor within 2 inches (51 mm) of the step or landing edge. Demarcation lines on walls shall transition vertically to the floor and then extend across the floor where a line on the floor is the only practical method of outlining the path. Where the wall line is broken by a door, demarcation lines on walls shall continue across the face of the door or transition to the floor and extend across the floor in front of such doors.

Exception: Demarcation lines shall not extend in front of exit doors that lead out of an exit enclosure and through which occupants must travel to complete the exit path.

1027.1.4.3 (IFC [B] 1027.1.4.3) (Supp) Transition. Where a wall mounted demarcation line transitions to a floor mounted demarcation line, or vice-versa, the wall mounted demarcation line shall drop vertically to the floor to meet a complimentary extension of the floor mounted demarcation line, thus forming a continuous marking.

1027.1.5 (IFC [B] 1027.1.5) (Supp) Uniformity. Placement and dimensions of markings shall be consistent and uniform throughout the same exit enclosure.

1027.1.6 (IFC [B] 1027.1.6) (Supp) Materials. ~~Luminescent exit~~ Luminous egress path markings shall be permitted to be made of any material, including paint, provided that an electrical charge is not required to maintain the required luminance. Such materials shall include, but not limited to, self-luminous materials and photoluminescent materials. Materials shall comply with either:

1. UL 1994, or
2. ASTM E 2072, except that the charging source shall be 1 foot candle (11 lux) of fluorescent illumination for 60 minutes, and the minimum luminance shall be 5 milicandelas per square meter after 90 minutes.

1027.1.7 (IFC [B] 1027.1.7) (Supp) Illumination. Exit enclosures where photoluminescent exit path markings are installed shall be provided with the minimum means of egress illumination required by Section 1006 for at least 60 minutes prior to periods when the building is occupied.

Reason: Sections 403.16 and 1027 were added by two-thirds majority of the membership present at the ICC Final Action Hearing in Rochester. The purpose of this code change proposal is two-fold. The first is to correct terminology used throughout the aforementioned sections. Second, the proposal will clarify the graphic requirements for the proper execution of egress path marking. The change the exception to Section 1027.1 is to correctly reference the section for lobbies and parking garages that serve as part of the exit discharge.

First, this proposal will correct the terminology used in these sections to conform to the terminology used in the referenced standard UL 1994. This standard uses the term "luminous egress path markings". Therefore, the term "luminescent" will be replaced with "luminous", and the term "exit path" will be replaced with "egress path". By aligning terminology with definitions utilized by the nationally recognized referenced standard UL 1994, practitioners and interpreters of the code will be able to mitigate confusion caused by potentially conflicting terms.

Second, this proposal will clarify that the luminous stripes shall be "solid and continuous", rather than a series of dots, icons or chevrons. A consistent standard for the graphic representation of egress markings will enhance the utility of such markings and enable the safe egress of buildings.

First, the code change proposal to correct terminology can only facilitate the use of the myriad codes, standards, and local laws that govern the construction and use of buildings. All too often, identical terms are used by different codes and standards, but those terms may be defined very differently. Where possible, definitions ought to be replicated across the codes and national standards, and specific terms should be duplicated in both definition and context in order to establish regulations that are irrefutable in light of competing standards and rules.

Second, the code change proposal to clarify the graphic standard for egress path markings is necessary to maintain a universal 'language' irrespective of location. Much like the red octagon denoting a vehicular traffic 'stop,' a readily recognized graphic consistency can significantly enhance the occupants' understanding of a building and its circulation, especially in unfamiliar environments. This proposed code clarification brings the graphic requirements into conformance with New York City's low-location egress path marking requirements instituted in response to the attacks on the World Trade Center of September 11, 2001. New York City had comprehensively reviewed and tested several types of luminous egress path marking systems and found the "solid and continuous" stripes to be the most effective and have required such markings retroactively for all high rise business buildings. The proposal approved at the Final Action Hearing in Rochester in 2007 added Sections 403.16 and 1027.1 with the intent to introduce to the IBC the same requirements that are already found in the New York City. This proposal is an essential clarification to prevent non-solid and non-continuous marking stripes of the type that New York City already prohibits.

Bibliography:

1. City of New York, Department of Buildings. Building Code Reference Standard RS 6-1 and 6-1A (available at http://www.nyc.gov/html/dob/downloads/pdf/rs_6-1.pdf). Promulgated May 31, 2005.
2. City of New York, Department of Buildings. World Trade Center Building Code Task Force: Findings and Recommendations (available at <http://home2.nyc.gov/html/dob/downloads/pdf/wtcctcf.pdf>). February, 2003.
City of New York.
3. Local Law 26 of 2004, Section 15, modifying Building Code Section 27-283 (available at http://www.nyc.gov/html/dob/downloads/bldgs_code/locallaw26of04.pdf). Enacted May 24, 2004.
4. UL 1994-04, Luminous Egress Path Marking Systems, with revisions through February, 2005.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The proposal provides some good clarifications. The term “luminous” is more consistent with the standard. The proposal clarified the requirements for exit discharge through lobbies or vestibules. The addition of “solid” and “continuous” will ensure that these markings are usable. The exception for open parking garages is needed. The proposal differentiates between the means of egress path and the luminescent path.

Assembly Action:

None

Final Hearing Results

E146-07/08

AS

Code Change No: **E147-07/08**

Original Proposal

Sections: 1027.1, 1027.1.6, 1027.2 (New), 1027.2.5 (New), 1027.2.6 (New), 1027.2.6.1 (New), 1027.2.6.2 (New), 1027.2.6.3 (New), 1027.3 (New), 1027.3.1 (New), 1027.7 (New), Chapter 35, (IFC [B] 1027.1, [B] 1027.1.6, [B] 1027.2 (New), [B] 1027.2.5 (New), [B] 1027.2.6 (New), [B] 1027.2.6.1 (New), [B] 1027.2.6.2 (New), [B] 1027.2.6.3 (New), [B] 1027.3 (New), [B] 1027.3.1 (New), [B] 1027.7 (New), Chapter 45)

Proponent: James P. Colgate, RA, Esq, City of New York, Department of Buildings; Thomas Jensen, City of New York Fire Department

1. Revise as follows:

**SECTION 1027 (IFC [B] 1027) (Supp)
EXIT PATH MARKINGS**

1027.1 (IFC [B] 1027.1) (Supp) General. Approved luminous markings delineating the exit path shall be provided in exit enclosures, including vertical exit enclosures and exit passageways, of buildings of Group A, B, E, I, M, and R-1 having occupied floors located more than 75 feet (22 860 mm) above the lowest level of fire department vehicle access and shall comply with Sections 1027.1.1 through 1027.1.7 in accordance with Sections 1027.2 through 1027.7.

Exception: Exit path markings shall not be required in lobbies or areas of open parking garages, where such lobby or area is located on the level of exit discharge and complies with the exception to Section 1023.4.1024.1 Exceptions 1 or 3.

1027.2 (IFC [B] 1027.2) Markings within exit enclosures. Egress path markings shall be provided in exit enclosures, including vertical exit enclosures and exit passageways, in accordance with Sections 1027.2.1 through 1027.2.6.

1027.1.1 (IFC [B] 1027.1.1) 1027.2.1 (IFC [B] 1027.2.1) (Supp) Steps. A stripe shall be applied to the horizontal leading edge of each step and shall extend for the full length of the step. Outlining stripes shall have a minimum horizontal width of 1 inch (25 mm) and a maximum width of 2 inches (51 mm). The leading edge of the stripe shall be placed at a maximum of ½ inch (13 mm) from the leading edge of the step and the stripe shall not overlap the leading edge of the step by not more than ½ inch (13 mm) down the vertical face of the step.

1027.1.2 (IFC [B] 1027.1.2) 1027.2.2 (IFC [B] 1027.2.2) (Supp) Landings: The leading edge of landings shall be marked with a stripe consistent with the dimensional requirements for steps.

1027.1.3 (IFC [B] 1027.1.3) 1027.2.3 (IFC [B] 1027.2.3) (Supp) Handrails: All handrails and handrail extensions shall be marked with a stripe having a minimum width of 1 inch (25 mm). The stripe shall be placed on the top surface of the handrail for the entire length of the handrail, including extensions and newel post caps. Where handrails or handrail extensions bend or turn corners, the stripe shall not have a gap of more than 4 inches (102 mm).

1027.1.4 (IFC [B] 1027.1.4) 1027.2.4 (IFC [B] 1027.2.4) (Supp) Perimeter demarcation lines: Stair landings and other floor areas within exit enclosures, with the exception of the sides of steps, shall be provided with demarcation lines on the floor or on the walls or a combination of both. The stripes shall be 1 (25 mm) to 2 inches (51 mm) wide with interruptions not exceeding 4 inches (102 mm).

1027.1.4.1 (IFC [B] 1027.1.4.1) 1027.2.4.1 (IFC [B] 1027.2.4.1) (Supp) Floor mounted demarcation lines: Perimeter demarcation lines shall be placed within 4 inches of the wall and shall extend to within 2 inches (51 mm) of the markings on the leading edge of landings. The demarcation lines shall continue across the floor in front of all doors.

Exception: Demarcation lines shall not extend in front of exit doors that lead out of an exit enclosure and through which occupants must travel to complete the exit path.

1027.1.4.2 (IFC [B] 1027.1.4.2) 1027.2.4.2 (IFC [B] 1027.2.4.2) (Supp) Wall mounted demarcation lines: Perimeter demarcation lines shall be placed on the wall with the bottom edge of the stripe no more than 4 inches (102 mm) above the finished floor. At the top or bottom of the stairs, demarcation lines shall drop vertically to the floor within 2 inches (51 mm) of the step or landing edge. Demarcation lines on walls shall transition vertically to the floor and then extend across the floor where a line on the floor is the only practical method of outlining the path. Where the wall line is broken by a door, demarcation lines on walls shall continue across the face of the door or transition to the floor and extend across the floor in front of such doors.

Exception: Demarcation lines shall not extend in front of exit doors that lead out of an exit enclosure and through which occupants must travel to complete the exit path.

1027.1.4.3 (IFC [B] 1027.1.4.3) 1027.2.4.3 (IFC [B] 1027.2.4.3) (Supp) Transition. Where a wall mounted demarcation line transitions to a floor mounted demarcation line, or vice-versa, the wall mounted demarcation line shall drop vertically to the floor to meet a complimentary extension of the floor mounted demarcation line, thus forming a continuous marking.

1027.2.5 (IFC [B] 1027.2.5) Obstacles. Obstacles at or below 6'-6" (1981 mm) in height and projecting more than 4" (102 mm) into the egress path shall be outlined with markings no less than 1" (25 mm) in width comprised of a pattern of alternating equal bands, of luminescent luminous material and black, with the alternating bands no more than 2" thick and angled at 45 degrees. Obstacles shall include, but are not limited to, standpipes, hose cabinets, wall projections, and restricted height areas. However, such markings shall not conceal any required information or indicators including but not limited to instructions to occupants for the use of standpipes.

1027.2.6 (IFC [B] 1027.2.6) Intervening doors within exit enclosures and discharge doors from exit enclosures. Doors through which occupants within an exit enclosure must pass in order to complete the exit path shall be provided with markings complying with Sections 1027.6.1 through 1027.2.6.3.

1027.2.6.1 (IFC [B] 1027.2.6.1) Low-location luminous marking for doors. The doors shall be identified by a low-location luminous marking complying with Section 1027.3.

1027.2.6.2 (IFC [B] 1027.2.6.2) Door Hardware markings. Door hardware shall be marked with no less than 16 in² (406 mm²) of luminous material. This marking shall be located behind, immediately adjacent to, or on the door handle and/or escutcheon. Where a panic bar is installed, such material shall be no less than 1" (25 mm) wide for the entire length of the actuating bar or touchpad.

1027.2.6.3 (IFC [B] 1027.2.6.3) Door frame markings. The top and sides of the door frame shall be marked with a solid and continuous 1" to 2" (25 mm to 51 mm) wide stripe. Where the door molding does not provide sufficient flat surface on which to locate the stripe, the stripe shall be permitted to be located on the wall surrounding the frame.

1027.3 (IFC [B] 1027.3) Markings where exit signs are provided. Where exit signs are provided in accordance with Section 1011 in interior corridors, at doors opening into exits, or within exit enclosures, approved low-location luminous egress path markings shall be provided. The top of the marking shall be not more than 18 inches (457 mm) above the finished floor. For doors, the marking shall be mounted on the door, or on the wall adjacent to latch side of the door with the nearest edge of the marking within 4 inches (100 mm) of the door frame.

1027.3.1 (IFC [B] 1027.3.1) Graphics. The marking shall comply with the following:

1. The marking shall contain the “emergency exit” symbol complying with the 1st line of Table 4.2 of NFPA 170, except that the color of the luminous portions shall be permitted to be a light, contrasting color in lieu of white. The exit symbol shall be least 4” (102 mm) high.
2. The marking shall contain the word EXIT printed in sans serif letters at least 4” (102 mm) high with strokes no less than ½” (13 mm). The color of the letters shall be the same as the exit symbol if the background is luminous, or shall be a light color or white if the letters are luminous and the background is the same color as the exit symbol.
3. In the case of markings that identify doors, the marking shall not be required to contain an arrow when mounted on the door, but shall contain an arrow when mounted on a wall. Any such arrow shall be at 45 degrees and at least 2 ¾” (70 mm) high and shall comply with the 3rd, 4th, 8th or 9th line of Table 4.2 of NFPA 170, except that the color of the arrow shall be the same as the exit symbol if the background is luminous, or shall be a light color or white if the exit symbol is luminous and the background is the same color as the exit symbol.
4. In the case of markings that do not identify a door, the sign shall contain an arrow at least 2 ¾” (70 mm) high, complying with the 2nd, 3rd, 4th, 7th, 8th or 9th line of Table 4.2 of NFPA 170, except that the color of the arrow shall be the same as the exit symbol if the background is luminescent, or shall be a light color or white if the arrow is luminescent and the background is the same color as the exit symbol.
5. Additional descriptive text shall be permitted, provided such words are in sans serif letters and are no more than one-half as high as the word EXIT or the emergency exit symbol.

1027.1.5 (IFC [B] 1027.1.5) 1027.4 (IFC [B] 1027.4) (Supp) Uniformity. Placement and dimensions of markings shall be consistent and uniform throughout the same exit enclosure.

1027.1.6 (IFC [B] 1027.1.6) 1027.5 (IFC [B] 1027.5) (Supp) Materials. Luminescent exit path markings shall be permitted to be made of any material, including paint, provided that an electrical charge is not required to maintain the required luminance. Such materials shall include, but not limited to, self-luminous materials and photoluminescent materials. Materials shall comply with either:

1. UL 1994, or
2. ASTM E 2072, except that the charging source shall be 1 foot candles (11 lux) of fluorescent illumination for 60 minutes, and the minimum luminance shall be 30 milicandelas per square meter at 10 minutes and 5 milicandelas per square meter after 90 minutes.

1027.1.7 (IFC [B] 1027.1.7) 1027.6 (IFC [B] 1027.6) (Supp) Illumination. Exit enclosures where photoluminescent exit path markings are installed shall be provided with the minimum means of egress illumination required by Section 1006 for at least 60 minutes prior to periods when the building is occupied.

1027.7 (IFC [B] 1027.7) Labeled. The markings shall be labeled in at least 6 point font with the manufacturer’s name and product number, the test standard utilized, and, where ASTM E 2072 is utilized, the luminance measurements at 10 and 90 minutes.

Exception: For paints and epoxies applied in the field, the labeling information shall be provided on the container.

2. Add standard to Chapter 35 (IFC Chapter 45) as follows:

NFPA

170-06 Standard for Fire Safety and Emergency Symbols

Reason: The purpose of this code change proposal is modify section 1027 to include the egress path marking components that are already required in high rise buildings in New York City.

At the Codes Forum in Orlando in 2006, the Means of Egress Committee was supportive of low-location egress path marking system for high rise buildings, but was frustrated by the number different proposals. The Committee rejected all of the proposals and suggested that the various proponents work together to resolve their differences, and to submit a more unified proposal in the future. As a result, at the Final Action hearing in Rochester, Section 1027 was added by over two-thirds majority of the membership present.

The luminous low-location egress path marking systems, required only in particular occupancies of high-rise buildings, identify the egress path elements in the event of failure of power and back-up power. Although based on the requirements already enacted in New York City, Section 1027, as adopted in Rochester, lacks some important components required in New York City and, therefore, did not result in a complete egress path marking system. Specifically, Section 1027 currently does not require the egress path marking system to include marking of obstacles, of intervening egress doors, and of access to the exit doors. This proposal will strengthen Section 1027 by adding into it these omitted features.

Organizationally, the proposal will break the egress path marking requirements into two parts. The first part will comprise Section 1027.2, and will include those markings within the exit enclosure. The second part will comprise Section 1027.3, and will include a limited amount of markings within the exit access.

This proposal will add three new components into section 1027:

1. Obstacles within exits: The current Section 1027 does not require the marking of obstacles, such as hose cabinets, radiators, pipes, etc. In dark conditions where only outlines of the steps, floors, and handrails are luminous, it is critical to mark the projecting obstacles to prevent accidents. Section 1027.2.5 will require markings of obstacles with luminous stripes.
2. Intervening doors within exits: The current Section 1027 does not require the marking of intervening doors through which an occupant who is already within the exit enclosure must thereafter pass through in order to complete the egress path. In dark conditions, it is critical to make clear to the occupant what is the next step when the stair ends abruptly at ground floor or at a transfer level. Section 1027.2.6 will require markings of such doors with luminous stripes around the door moldings, markings at the door hardware, and a low-location sign.
3. At locations where exit signs are required: The current section 1027 provides markings within the exit enclosure, but does not require any markings that identify the exits from the exit access side. When the power and back-up power fail, finding the exit in the dark would be difficult without low-location luminous markings. Section 1027.3 will require low-location markings at the door opening onto the exit and interior corridors at the same locations where high-location exit signs are required by Section 1011.

Additionally, the proposal will add a requirement for a minimum luminance measurement at 10 minutes for products tested under the ASTM 2072 testing standard. This was inadvertently omitted from the prior proposal. The 10-minute standard will ensure that the luminance has a sufficient luminance decay curve such that the markings will be brighter at the beginning of an evacuation.

Lastly, the proposal will require that the products be labeled by the manufacturer to increase accountability and prevent counterfeiting.

The new additions to Section 1027 come from the standards established by New York City's RS 6-1. The RS 6-1 was developed by the New York City Department of Buildings' architects and engineers after over one year of research of all available relevant standards, including but not limited to those published by the ASTM, UL, ISO, IMO, APTA (American Public Transportation Association). In addition, the department performed outreach and consultation with the various industries, including those from overseas. The Buildings Department also inspected mock-up/test installations of luminescent markings in various permutations, with different placement and dimensional configurations, to ensure that the resulting standards were adequate and appropriate. The result of all this research was a draft standard that was published for public comment – the public hearing on the proposal drew over 80 attendees representing a wide range of egress and safety experts. As a result of the public comment, the draft standard was refined and published in final form on May 31, 2005. Since then over 1500 installations have been completed in high rise buildings pursuant to this standard. It is on the basis of this experience that this proposal is being made.

Regarding obstacles markings, the text comes from New York City's RS 6-1. The only change to New York's city language was a clarification that required standpipe instructions should not be covered by the markings.

Regarding the intervening door markings, the text also comes from New York City's RS 6-1.

Regarding the markings on the exit access side of exit doors, the text comes from New York City's RS 6-1. However, at the time of RS 6-1's enactment in 2005, the NFPA 170 had not yet been updated to include the international arrow and egress symbols. As a result, RS 6-1 referenced ISO 7010 (2003). With the recent modification to NFPA 170 (2006), this proposal will reference to NFPA instead of ISO.

Regarding the 10-minute measurement at 30 millicandelas per square meter, this is the same luminance reading as specified in New York City's RS 6-1.

Regarding the labeling requirement, this is the same as specified in New York City's RS 6-1. There is no need to specify labeling for products tested to UL 1994 since UL 1994 already has a labeling provision as a condition of the listing.

Bibliography:

1. ASTM E 2072-04, Standard Specification for Photoluminescent (Phosphorescent) Safety Marking
2. City of New York, Department of Buildings. Building Code Reference Standard RS 6-1 and 6-1A (available at http://www.nyc.gov/html/dob/downloads/pdf/rs_6-1.pdf). Promulgated May 31, 2005.
3. City of New York, Department of Buildings. Word Trade Center Building Code Task Force: Findings and Recommendations (available at <http://home2.nyc.gov/html/dob/downloads/pdf/wtcbctf.pdf>). February, 2003. City of New York.
4. Local Law 26 of 2004, Section 15, modifying Building Code Section 27-283 (available at http://www.nyc.gov/html/dob/downloads/bldgs_code/locallaw26of04.pdf). Enacted May 24, 2004.
5. UL 1994-04, Luminous Egress Path Marking Systems, with revisions through February, 2005.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing Results

Analysis: Review of proposed new standard NFPA 170 indicated that, in the opinion of ICC Staff, the standard did comply with ICC standards criteria.

Committee Action:

Disapproved

Committee Reason: The proposal would require photo luminescent markings in all corridors, not just in exits. With all obstructions being marked, the visual clutter may be a problem for occupants following the means of egress. There was no justification provided that the current requirements were not adequate. There is no testing that photoluminescent markings are going to provide additional levels of protection in general, and this proposal is just adding more. Section 1027.3.1 references only specific lines of a table in NFPA 170 – the requirements should be moved into the code. The labeling requirement in Section 1027.7 is a problem for enforcement – where and how often in a building. Low exit signage was previously disapproved in E80-07/08. The proponent developed new standards for graphics instead of following those in NFPA 170.

Assembly Action:

None

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

James P. Colgate, RA, Esq., New York City Department of Buildings, requests Approval as Modified by this public comment.

Modify proposal as follows:

~~1027.2.6 Intervening doors within exit enclosures and discharge doors from exit enclosures.~~ Doors through which occupants within an exit enclosure must pass in order to complete the exit path shall be provided with markings complying with Sections 1027.6.1 through 1027.2.6.3.

~~1027.2.6.1. Emergency Exit Symbol. Low-location luminous marking for doors.~~ The door shall be identified by a low-location luminous emergency exit symbol complying with NFPA 170 marking complying with Section 1027.3. The exit symbol shall be a minimum of 4 inches (102 mm) in height and shall be mounted on the door, centered horizontally, with the top of the symbol no higher than 18 inches (457 mm) above the finished floor.

~~1027.3 Markings where exit signs are provided.~~ Where exit signs are provided in accordance with Section 1011 in interior corridors, at doors opening into exits, or within exit enclosures, approved low-location luminous egress path markings shall be provided. The top of the marking shall be not more than 18 inches (457 mm) above the finished floor. For doors, the marking shall be mounted on the door, or on the wall adjacent to latch side of the door with the nearest edge of the marking within 4 inches (100 mm) of the door frame.

~~1027.3.1 Graphics.~~ The marking shall comply with the following:

- ~~1. The marking shall contain the "emergency exit" symbol complying with the 1st line of Table 4.2 of NFPA 170, except that the color of the luminous portions shall be permitted to be a light, contrasting color in lieu of white. The exit symbol shall be least 4" (102 mm) high.~~
- ~~2. The marking shall contain the word EXIT printed in sans serif letters at least 4" (102 mm) high with strokes no less than 1/2" (13 mm). The color of the letters shall be the same as the exit symbol if the background is luminous, or shall be a light color or white if the letters are luminous and the background is the same color as the exit symbol.~~
- ~~3. In the case of markings that identify doors, the marking shall not be required to contain an arrow when mounted on the door, but shall contain an arrow when mounted on a wall. Any such arrow shall be at 45 degrees and at least 2 3/4" (70 mm) high and shall comply with the 3rd, 4th, 8th or 9th line of Table 4.2 of NFPA 170, except that the color of the arrow shall be the same as the exit symbol if the background is luminous, or shall be a light color or white if the exit symbol is luminous and the background is the same color as the exit symbol.~~
- ~~4. In the case of markings that do not identify a door, the sign shall contain an arrow at least 2 3/4" (70 mm) high, complying with the 2nd, 3rd, 4th, 7th, 8th or 9th line of Table 4.2 of NFPA 170, except that the color of the arrow shall be the same as the exit symbol if the background is luminescent, or shall be a light color or white if the arrow is luminescent and the background is the same color as the exit symbol.~~
- ~~5. Additional descriptive text shall be permitted, provided such words are in sans serif letters and are no more than one-half as high as the word EXIT or the emergency exit symbol.~~

(Renumber remaining paragraphs 1027.4, 1027.5, 1027.6)

~~1027.7 Labeled.~~ The markings shall be labeled in at least 6 point font with the manufacturer's name and product number, the test standard utilized, and, where ASTM E 2072 is utilized, the luminance measurements at 10 and 90 minutes.

Exception: For paints and epoxies applied in the field, the labeling information shall be provided on the container.

(Portions of proposal not shown remain unchanged)

Commenter's Reason: In Rochester, the ICC membership voted to add low-location luminous egress path markings as a requirement in the exit enclosures of most new high-rise buildings. This improvement in fire safety followed the lead of New York City – which required such markings in all new and existing high rise office buildings back in 2004 as a result of lessons learned from 1993 and 2001 World Trade Center attacks.

However, the Rochester change did not address three fundamental aspects of the low-location luminous egress path system – namely, the marking of the door opening into the exit enclosure, the marking of the protruding obstacles within the exit enclosure, and the marking of the door discharging from the exit enclosure. In Palm Springs, I submitted a proposal that rectified all three missing components.

However, in Palm Springs, the Means of Egress Committee made clear that it was not ready to require low-location luminous egress path markings outside of the exit enclosures. It was concerned about the placement of such markings, that it was simply too much, and that it would make for much visual clutter.

The other issues raised by the Means of Egress Committee were related to the overly-complicated way in which the proposal referenced NFPA 170 (Standard for Fire Safety and Emergency Symbols), and that the labeling requirement was problematic.

This public comment squarely addresses all of these of these Committee concerns.

First, it eliminates any requirement for markings outside of the exit enclosure – if accepted by the membership, this comment will restrict the markings solely to within the exit enclosure. While the result will be less extensive than New York City's requirements, the overall system resulting from adoption of this comment will greatly improve safety.

Second, it simplifies the NFPA signage, so that the only signage requirement is a single, low-location emergency exit symbol on the inside face of the door that exits out of the exit enclosure. This exit symbol on the discharge door is an important feature because knowing which door is the one out of the exit enclosure is important to the safe evacuation when there is a loss of both primary and emergency power.

Third, it removes the labeling requirement that the committee found problematic.

The result of these changes to E 147 is that the path markings that the 2009 IBC will require in high-rise buildings will provide a complete and safe system of emergency egress.

Final Hearing Results

E147-07/08

AMPC

Code Change No: **E148-07/08**

Original Proposal

Sections: 1027.1.6 (IFC [B] 1027.1.6)

Proponent: Manny Muniz, Manny Muniz Associates, LLC, representing himself

1. Add new text as follows:

1027.1.6 (IFC [B] 1027.1.6) Stairway floor number signs. Stairway floor number signs required by 1020.1.6 shall also comply with Section 1027.1.8.

2. Revise text as follows:

~~1027.1.6 (IFC [B] 1027.1.6)~~ **1027.1.7 (IFC [B] 1027.1.7) (Supp) Materials.** Luminescent exit path markings shall be permitted to be made of material including paint, provided that an electrical charge is not required to maintain the required luminance. Such materials shall include, but not be limited to, self-luminous materials and photoluminescent materials. Materials shall comply with either:

1. UL 1994 or
2. ASTM E 2072, except that the charging source shall be 1 foot candle (11 lux) of fluorescent illumination for 60 minutes, and the minimum luminance shall be 5 millicandles per square meter after 90 minutes.

~~1027.1.7 (IFC [B] 1027.1.7)~~ **1027.1.8 (IFC [B] 1027.1.8) (Supp) Illumination.** Exit enclosures where photoluminescent exit path markings are installed shall be provided with the minimum means of egress illumination required by Section 1006 for at least 60 minutes prior to periods when the building is occupied.

Reason: The ICC membership agreed with the New York City Building Code by voting to require that stairs, handrails and stair landings in high rise stair enclosures be marked so they are visible during normal, emergency and total blackout lighting conditions. Stairway floor numbers signs required by Section 1020.1.6 give critical egress information which should also be visible during all three of these lighting conditions.

Cost Impact: The code change proposal will increase the cost of construction.

Analysis: The 2007 Supplement includes a new Section 1027 Exit Path Markings where this proposal language would be located. A consideration would be if this new requirement should be located in Section 1020.1.6

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: Section 1020.1.6 uses the term 'stairway identification' signs instead of 'stairway floor number signs' used in this proposal. The signage requirements should be in Section 1020, not in photoluminescent requirements.

Assembly Action:

None

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Manny Muniz, Manny Muniz Associates, LLC, representing himself, requests Approval as Modified by this public comment.

Replace proposal as follows:

1020.1.6 (IFC [B] 10201.1.6) (Supp) Floor identification signs. A sign shall be provided at each floor landing in interior exit enclosures connecting more than three stories designating the floor level, the terminus of the top and bottom of the exit enclosure and the identification of the stair or ramp. The signage shall also state the story of, and the direction to the exit discharge and the availability of roof access from the enclosure for the fire department. The sign shall be located 5 feet (1524 mm) above the floor landing in a position that is readily visible when the doors are in the open and closed positions. Floor level identification signs in tactile characters complying with ICC A117.1, shall be located at each floor level landing adjacent to the door leading from the enclosure into the corridor to identify the floor level.

1020.1.6.1 (IFC [B] 10201.1.6.1) (Supp) Signage requirements. Stairway identification signs shall comply with all of the following requirements:

1. The signs shall be a minimum size of 18 inches (457 mm) by 12 inches (305 mm).
2. The letters designating the identification of the stair enclosure shall be a minimum of 1 1/2 inches (38 mm) in height.
3. The number designating the floor level shall be a minimum of 5 inches (127 mm) in height and located in the center of the sign.
4. All other lettering and numbers shall be a minimum of 1 inch (22 mm) in height.
5. Characters and their background shall have a nonglare finish. Characters shall contrast with their background, with either light characters on a dark background or dark characters on a light background.
6. When signs required by Section 1020.1.6 are installed in interior exit enclosures of buildings subject to Section 1027, the signs shall be made of the same materials as required by Section 1027.1.6.

Commenter's Reason: The committee's reason for disapproval was not because the proposal did not have merit but because it was not located in the correct section of the code. Based on the recommendations of the committee, the proposal has now been relocated to 1020.1.6.

The ICC membership agreed with the New York City Building Code by voting to require that stairs, handrails and stair landings in high rise stair enclosures be marked so they are visible during normal, emergency and total blackout lighting conditions. Stairway floor numbers signs required by Section 1020.1.6 give critical egress information which should also be visible during all three of these lighting conditions.

Final Hearing Results

E148-07/08

AMPC

Code Change No: E151-07/08

Original Proposal

Sections: 1103.2.12, 1103.2.13 (New)

Proponent: Dominic Marinelli, United Spinal Association

1. Revise as follows:

1103.2.12 Day care facilities. Where a day care facility (Groups A-3, E, I-4 and R-3) is part of a detached one- and two- family dwelling unit, only the portion of the structure utilized for the day care facility is required to be accessible.

2. Add new text as follows:

1103.2.13 Live/Work units. In Live/Work units constructed in accordance with Section 419, the portion of the unit utilized for nonresidential use is required to be accessible. The residential portion of the Live/Work unit is required to be evaluated separately in accordance with Sections 1107.6.2 and 1107.7.

Reason: Last cycle, Live/Work units were added to the IBC as a new Section 419 by code change proposal G92-06/07. Section 419.7 references the user back to Chapter 11 for accessibility requirements. However, the simple reference leaves ambiguous how to apply Chapter 11. The Americans with Disabilities Act applies to the work area and the Fair Housing Act applies to the residential area independent of the work area. To be consistent with the Fair Housing Act, a floor that contains no livable residential space cannot be considered a story with Type B units.

It is therefore appropriate to address Live/Work requirements in Chapter 11. Although the entire live/work unit is considered an R-2 use, for Chapter 11 purposes it must be treated as dwelling units over business or mercantile use. To clearly identify the requirements, it needs to be addressed separately. The 2007 Supplement language is included in the reason statement for those not familiar with the requirements.

The change to Section 1103.2.12 is for consistency with this proposal when these facilities are considered Live/Work units or mixed use facilities in private homes.

Detached dwellings that are just residential are still exempted under Section 1103.2.4.

**SECTION 419 (Supp)
LIVE/WORK UNITS**

419.1 (Supp) General. A live/work unit is a dwelling unit or sleeping unit in which a significant portion of the space includes a nonresidential use that is operated by the tenant and shall comply with Section 419.

Exception: Dwelling or sleeping units that include an office that is less than 10 percent of the area of the dwelling unit shall not be classified as a live/work unit.

419.1.1 (Supp) Limitations. The following shall apply to all live/work areas:

1. The live/work unit is permitted to be a maximum of 3,000 square feet (279 m²);
2. The nonresidential area is permitted to be a maximum 50 percent of the area of each live/work unit;
3. The nonresidential area function shall be limited to the first or main floor only of the live/work unit; and
4. A maximum of five nonresidential workers or employees are allowed to occupy the non-residential area at any one time.

419.2 (Supp) Occupancies. Live/work units shall be classified as a Group R-2 occupancy. Separation requirements found in Section 508.3 shall not apply when the live/work unit is in compliance with Section 419. High-hazard and storage occupancies shall not be permitted in a live/work unit. The aggregate of storage in the live/work unit shall be limited to 10 percent of the space dedicated to nonresidential activities.

419.3 (Supp) Means of egress. Except as modified by this section, the provisions for Group R-2 occupancies in Chapter 10 shall apply to the entire live/work unit.

419.3.1 (Supp) Egress capacity. The egress capacity for each element of the live/work unit shall be based on the occupancy load for the occupancy served in accordance with Table 1004.1.1.

419.3.2 (Supp) Sliding doors. Where doors in a means of egress are of the horizontal-sliding type, the force to slide the door to its fully open position shall not exceed 50 pounds (220 N) with a perpendicular force against the door of 50 pounds (220 N).

419.3.3 (Supp) Spiral stairs. Spiral stairs that conform to the requirements of Section 1009.8 shall be permitted.

419.3.4 (Supp) Locks. Egress doors shall be permitted to be locked in accordance with Exception 4 of Section 1008.1.8.3.

419.4 (Supp) Vertical openings. Floor openings between floor levels of a live/work unit are permitted without enclosure.

419.5 (Supp) Fire protection. The live/work unit shall be provided with a monitored fire alarm system where required by Section 907.2.9 and a fire sprinkler system in accordance with Section 903.2.7.

419.6 (Supp) Structural. Floor loading for the areas within a live/work unit shall be designed to conform to Table 1607.1 based on the function within the space.

419.7 (Supp) Accessibility. Accessibility shall be designed in accordance with Chapter 11.

419.8 (Supp) Ventilation. The applicable requirements of the *International Mechanical Code* shall apply to each area within the live/work unit for the function within that space.

Cost Impact: This code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Modified

Modify the proposal as follows.

1103.2.12 Day care facilities. Where a day care facility (Groups A-3, E, I-4 and R-3) is part of a ~~detached one- and two- family~~ dwelling unit, only the portion of the structure utilized for the day care facility is required to be accessible.

(Portions of proposal not shown remain unchanged)

Committee Reason: The modification was to withdraw the portion of the proposal dealing with day care facilities and retain the current code language based on the proponent's request. The new language for accessibility for live-work units adds clarity with specific references for this mixed occupancy space.

Assembly Action:

None

Final Hearing Results

E151-07/08

AM

Code Change No: E152-07/08

Original Proposal

Sections: 1104.3, 1107.3

Proponent: Clifton D Thomason, AIA

Revise as follows:

1104.3 (Supp) Connected spaces. When a building or portion of a building is required to be accessible, an accessible route shall be provided to each portion of the building, to accessible building entrances connecting accessible pedestrian walkways and the public way.

Exceptions:

1. In assembly areas with fixed seating, an accessible route shall not be required to serve levels where wheelchair spaces are not provided.
2. In Group I-2 facilities, doors to sleeping units shall be exempted from the requirements for maneuvering clearance at the room side provided the door is a minimum of 44 inches (1118 mm) in width.

1107.3 Accessible spaces. Rooms and spaces available to the general public or available for use by residents and serving Accessible units, Type A units or Type B units shall be accessible. Accessible spaces shall include toilet and bathing rooms, kitchen, living and dining areas and any exterior spaces, including patios, terraces and balconies.

Exceptions:

1. Recreational facilities in accordance with Section 1109.14.
2. In Group I-2 facilities, doors to sleeping units shall be exempted from the requirements for maneuvering clearance at the room side provided the door is a minimum of 44 inches (1118 mm) in width.

Reason: This exception has been in every accessibility code dating back to ANSI A117.1 from the mid 80's, through the publication of the ADA as well as various state adopted accessibility codes. The omission of this exception can cause confusion and potential conflict between designers and building officials. The cost of I-2 construction will certainly increase if this exception continues to be omitted.

Cost Impact: The cost of construction will not go up if this is adopted.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: Requiring maneuvering clearances at 44 inch doors in hospital rooms would be a significant cost to hospitals, therefore this exception is appropriate. This was removed from ICC A117.1 2003 without consideration of these costs. The ADA/ABA Accessibility Guidelines do not require maneuvering clearances at either side of these doors.

Assembly Action:

None

Final Hearing Results

E152-07/08

AS

Code Change No: E153-07/08

Original Proposal

Section: 1104.4

Proponent: Maureen Traxler, City of Seattle, Department of Planning and Development

Revise as follows:

1104.4 (Supp) Multilevel buildings and facilities. At least one accessible route shall connect each accessible level, including mezzanines, in multilevel buildings and facilities.

Exceptions:

1. An accessible route is not required to stories and mezzanines that have an aggregate area of not more than 3,000 square feet (278.7m²) and are located above and below accessible levels that have an aggregate area of not more than 3,000 square feet (278.7 m²). This exception shall not apply to:
 - 1.1. Multiple tenant facilities of Group M occupancies containing five or more tenant spaces;
 - 1.2. Levels containing offices of health care providers (Group B or I); or
 - 1.3. Passenger transportation facilities and airports (Group A-3 or B).

2. Levels that do not contain accessible elements or other spaces required by Section 1107 or 1108 are not required to be served by an accessible route from an accessible level.
3. In air traffic control towers, an accessible route is not required to serve the cab and the floor immediately below the cab.
4. Where a two-story building or facility has one story with an occupant load of five or fewer persons that does not contain public use space, that story shall not be required to be connected by an accessible route to the story above or below.
5. Vertical access to elevated employee work stations within a courtroom is not required at the time of initial construction, provided a ramp, lift or elevator complying with ICC A117.1 can be installed without requiring reconfiguration or extension of the courtroom or extension of the electrical system.

Reason: This is an editorial proposal to clarify that the limitation of 3000 square feet applies to the mezzanines and not to the accessible levels

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The revised language clarifies that the 3,000 square foot area is the mezzanines, basements or upper stories and not the accessible ground floor level.

Assembly Action:

None

Final Hearing Results

E153-07/08

AS

Code Change No: E156-07/08

Original Proposal

Section: 1106.5

Proponent: Thomas Meyers, CBO, City of Central, CO, representing himself

Revise as follows:

1106.5 Van spaces. For every six or fraction of six accessible parking spaces, at least one shall be a van-accessible parking space.

Exception: In Group R-2 and R-3 occupancies, van accessible spaces located within private garages shall be permitted to have vehicular routes, entrances, parking spaces, and access aisles with a minimum vertical clearance of 7 feet (2134 mm).

Reason Section 1106.2 requires 2 percent of provided parking to be accessible where groups R-2 and R-3 are provided with Accessible, Type A or Type B units. Accessible parking spaces are required to be placed within or beneath a building when such parking is provided. Section 1106.5 requires one in six accessible spaces to be van accessible. Section 1106.2 states that accessible spaces be dispersed into or under the building. It is reasonable to conclude that this includes van accessible spaces also.

Many residential projects have a substantial proportion of available parking located within a building in attached private garages. Typically these garages are accessed through the interior of a private dwelling. It is not uncommon to see van accessible spaces required to be dispersed within the interior of these garages. ANSI A117.1-2003 provides provisions for design of these spaces to accommodate an accessible van. Among these is a requirement that the vertical clearance be 98" in height for the entrance, route and space provided. An elevated story level must be provided to accommodate the additional 2" required beyond the common 8 foot high wall building module. The door assembly typically must be 10 feet in height to allow for the 98" passage and headroom with the door in the fully open position.

I contacted some members of the means of egress committee following the change to creating Section 1106.2. At least one committee member stated to me that he thought that the requirement was only intended to ensure that the private garage would provide sufficient width for a typical vehicle space with an access aisle to accommodate a side loaded lift. He indicated that he didn't think that the committee or membership intended that the vehicular headroom requirements of ANSI A117.1 be employed.

This code change is intended to clarify that the vehicle headroom clearance be consistent with that required for parking garages regulated by IBC Section 406.2.2. This headroom requirement would only apply to garages required to have a van accessible space. The other requirements of ANSI A117.1-2003 Section 502 would be applicable for design of the van accessible space. This change would permit the more common wheelchair accessible low roof minivan to use these van accessible spaces without requiring radical modifications to the ceiling and door entrance heights.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: Van spaces are not required by the Fair Housing Act. The extra height for van spaces in private parking garages for Group R-2 and R-3 is an unnecessary expense. The extra height for van spaces was really intended for places of public accommodation under the ADAAG.

Assembly Action:

None

Final Hearing Results

E156-07/08

AS

Code Change No: E159-07/08

Original Proposal

Sections: 708.3, 1107.5.1.2, 1107.5.2.1, 1107.5.2.2, 1107.5.3.2, Table 1107.6.1.1, 1107.6.1.2, 1107.6.3, 1107.6.4.2, 1107.7.1

Proponent: Philip Brazil, PE, Reid Middleton Inc., representing himself

Revise as follows:

708.3 (Supp) Fire-resistance rating. Fire partitions shall have a fire-resistance rating not less than 1 hour.

Exceptions:

1. Corridor walls permitted to have a 0.5 hour fire-resistance rating by Table 1017.1.
2. Dwelling unit and sleeping unit separations in buildings of Type IIB, IIIB and VB construction shall have fire-resistance ratings of not less than 1/2 hour in buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.

1107.5.1.2 Type B units. In structures with four or more dwelling units or sleeping units intended to be occupied as a residence, every dwelling unit and sleeping unit intended to be occupied as a residence shall be a Type B unit.

Exception: The number of Type B units is permitted to be reduced in accordance with Section 1107.7.

1107.5.2.1 Accessible units. At least 50 percent but not less than one of each type of the dwelling units and sleeping units shall be Accessible units.

1107.5.2.2 Type B units. In structures with four or more dwelling units or sleeping units intended to be occupied as a residence, every dwelling unit and sleeping unit intended to be occupied as a residence shall be a Type B unit.

Exception: The number of Type B units is permitted to be reduced in accordance with Section 1107.7.

1107.5.3.2 Type B units. In structures with four or more dwelling units or sleeping units intended to be occupied as a residence, every dwelling unit and sleeping unit intended to be occupied as a residence shall be a Type B unit.

Exception: The number of Type B units is permitted to be reduced in accordance with Section 1107.7.

**TABLE 1107.6.1.1 (Supp)
ACCESSIBLE DWELLING UNITS AND SLEEPING UNITS**

TOTAL NUMBER OF UNITS PROVIDED	MINIMUM REQUIRED NUMBER OF ACCESSIBLE UNITS WITHOUT ROLL-IN SHOWERS	MINIMUM REQUIRED NUMBER OF ACCESSIBLE UNITS WITH ROLL-IN SHOWERS	TOTAL NUMBER OF REQUIRED ACCESSIBLE UNITS
1 to 25	1	0	1
26 to 50	2	0	2
51 to 75	3	1	4
76 to 100	4	1	5
101 to 150	5	2	7
151 to 200	6	2	8
201 to 300	7	3	10
301 to 400	8	4	12
401 to 500	9	4	13
501 to 1,000	2% of total	1% of total	3% of total
Over 1,000	20, plus two for each 100, or fraction thereof, over 1,000	10, plus one for each 100, or fraction thereof, over 1,000	30, plus two for each 100, or fraction thereof, over 1,000

1107.6.1.2 Type B units. In structures with four or more dwelling units or sleeping units intended to be occupied as a residence, every dwelling unit and sleeping unit intended to be occupied as a residence shall be a Type B unit.

Exception: The number of Type B units is permitted to be reduced in accordance with Section 1107.7.

1107.6.3 Group R-3. In Group R-3 occupancies where there are four or more dwelling units or sleeping units intended to be occupied as a residence in a single structure, every dwelling unit and sleeping unit intended to be occupied as a residence shall be a Type B unit.

Exception: The number of Type B units is permitted to be reduced in accordance with Section 1107.7.

1107.6.4.2 Type B units. In structures with four or more dwelling units or sleeping units intended to be occupied as a residence, every dwelling unit and sleeping unit intended to be occupied as a residence shall be a Type B unit.

Exception: The number of Type B units is permitted to be reduced in accordance with Section 1107.7.

1107.7.1 Structures without elevator service. Where no elevator service is provided in a structure, only the dwelling units and sleeping units that are located on stories indicated in Sections 1107.7.1.1 and 1107.7.1.2 are required to be Type A and Type B units, respectively. The number of Type A units shall be determined in accordance with Section 1107.6.2.1.1.

Reason: The purpose of the proposal is to replace undefined terms with defined terms (see Section 202). The intent is to complete this process, which is accomplished throughout the 2006 IBC except for the instances in the proposal. In Section 1107.7.1, "respectively" is added to prevent the interpretation that dwelling units and sleeping units would each be required to comply with the requirements for Type A units and Type B units, which the currently language implies.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The additional language is editorial and adds clarity to the code.

Assembly Action:

None

Final Hearing Results

E159-07/08

AS

Code Change No: **E160-07/08**

Original Proposal

Sections: 1104.5, 1107.7, 1107.7.1, 1107.7.5, 1109.1, 3109.4.1.8

Proponent: Philip Brazil, PE, Reid Middleton, Inc., representing himself

Revise as follows:

1104.5 Location. Accessible routes shall coincide with or be located in the same area as a general circulation path. Where the circulation path is interior, the accessible route shall also be interior. Where only one accessible route is provided, the accessible route shall not pass through kitchens, storage rooms, restrooms, closets or similar spaces.

Exceptions:

1. Accessible routes from parking garages contained within and serving Type B dwelling units are not required to be interior.
2. A single accessible route is permitted to pass through a kitchen or storage room in an Accessible unit, Type A unit or Type B dwelling unit.

1107.7 General exceptions. Where specifically permitted by Section 1107.5 or 1107.6, the required number of Type A units and Type B units is permitted to be reduced in accordance with Sections 1107.7.1 through 1107.7.5.

1107.7.1 Structures without elevator service. Where no elevator service is provided in a structure, only the dwelling and sleeping units that are located on stories indicated in Sections 1107.7.1.1 and 1107.7.1.2 are required to be Type A units and Type B units. The number of Type A units shall be determined in accordance with Section 1107.6.2.1.1.

1107.7.5 Design flood elevation. The required number of Type A units and Type B units shall not apply to a site where the required elevation of the lowest floor or the lowest horizontal structural building members of nonelevator buildings are at or above the design flood elevation resulting in:

1. A difference in elevation between the minimum required floor elevation at the primary entrances and vehicular and pedestrian arrival points within 50 feet (15 240 mm) exceeding 30 inches (762 mm), and
2. A slope exceeding 10 percent between the minimum required floor elevation at the primary entrances and vehicular and pedestrian arrival points within 50 feet (15 240 mm).

Where no such arrival points are within 50 feet (15 240 mm) of the primary entrances, the closest arrival points shall be used.

1109.1 General. Accessible building features and facilities shall be provided in accordance with Sections 1109.2 through 1109.14.

Exception: Type A units and Type B ~~dwelling and sleeping~~ units shall comply with ICC A117.1.

3109.4.1.8 (Supp) Dwelling wall as a barrier. Where a wall of a dwelling serves as part of the barrier, one of the following shall apply:

1. Doors with direct access to the pool through that wall shall be equipped with an alarm that produces an audible warning when the door and/or its screen, if present, are opened. The alarm shall be listed in accordance with UL 2017. In dwellings not required to be Accessible units, Type A units or Type B units, the deactivation switch shall be located 54 inches (1372 mm) or more above the threshold of the door. In dwellings required to be Accessible units, Type A units or Type B units, the deactivation switch(es) shall be located 54 inches (1372 mm) maximum and 48 inches (1219 mm) minimum above the threshold of the door.
2. The pool shall be equipped with a power safety cover which complies with ASTM F 1346.

3. Other means of protection, such as self-closing doors with self-latching devices, which are approved, shall be accepted so long as the degree of protection afforded is not less than the protection afforded by Section 3109.4.1.8, Item 1 or 2.

Reason: The purpose of the proposal is to replace undefined terms with defined terms (see Section 1102.1). The intent is to complete this process, which is accomplished throughout the 2006 IBC except for the instances in the proposal. "Dwelling and sleeping" is also deleted in Section 1109.1 to eliminate superfluous language.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The additional language is editorial and adds clarity to the code.

Assembly Action:

None

Final Hearing Results

E160-07/08

AS

Code Change No: E161-07/08

Original Proposal

Sections: 1107.6.1.1, 1107.6.2.1.1

Proponent: Maureen Traxler, City of Seattle, WA, Department of Planning & Development

Revise as follows:

1107.6.1.1 Accessible units. In Group R-1 occupancies, Accessible dwelling units and sleeping units shall be provided in accordance with Table 1107.6.1.1. All R-1 units facilities on a site shall be considered to determine the total number of Accessible units. Accessible units shall be dispersed among the various classes of units. Roll-in showers provided in Accessible units shall include a permanently mounted folding shower seat.

1107.6.2.1.1 Type A units. In Group R-2 occupancies containing more than 20 dwelling units or sleeping units, at least 2 percent but not less than one of the units shall be a Type A unit. All R-2 units on a site shall be considered to determine the total number of units and the required number of Type A units. Type A units shall be dispersed among the various classes of units.

Exceptions:

1. The number of Type A units is permitted to be reduced in accordance with Section 1107.7.
2. Existing structures on a site shall not contribute to the total number of units on a site.

Reason: The term "facilities" as defined in Section 1102 is very vague and broad. It includes "all or any portion of buildings, structures, site improvements, elements and pedestrian or vehicular routes". Requiring all "facilities" to be considered in determining the number of Accessible units doesn't give much guidance as to which facilities are relevant. The pertinent consideration should be the number of R-1 units on the site. Similarly, Section 1107.6.2.1.1 currently states that "all units" on the site should be considered. This proposal adds a clarification that the R-2 units are considered.

Clarity on this point is important for the sites that have a mixture of types of housing. There are many projects that try to create diverse, mixed-income neighborhoods by including a mix of R-3 with R-2 and R-1 housing.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The proposal provides more specific language by indicating Group R-1 units.

Assembly Action:

None

Final Hearing Results

E161-07/08

AS

Code Change No: E163-07/08

Original Proposal

Section: 1108.2.1

Proponent: Maureen Traxler, City of Seattle, WA, Department of Planning & Development

Revise as follows:

1108.2.1 Services. ~~Services and facilities provided in areas not required to be accessible. If a service or facility is provided in an area that is not accessible, the same service or facility shall be provided on an accessible level and shall be accessible.~~

Reason: This proposal is an attempt to restate Section 1108.2.1 to more clearly convey its intended meaning. We believe that it is intended to require that, if services are provided in an area that is not accessible, those same services must be provided in another area that is accessible, and the services themselves must be accessible.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The proposal clarifies which service areas are being addressed by this requirement.

Assembly Action:

None

Final Hearing Results

E163-07/08

AS

Code Change No: **E164-07/08**

Original Proposal

Section: 1108.2.3 (New)

Proponent: Scott Crossfield, Theatre Projects Consultants, Inc., representing himself

Add new text as follows:

1108.2.3 Companion seats. At least one companion seat complying with ICC A117.1 shall be provided immediately adjacent to each wheelchair space required by Section 1108.2.2.1 through 1108.2.2.3.

Reason: The intent of this proposal is to clean up any confusion about the number of companion seats required. Although requirements for companion seats are in the current edition of ICC A117.1, the standard identifies how wheelchair spaces and companion seats are to be provided in assembly seating, not how many of either. Therefore, without this change a potential dispute exists about how many companion chairs are required.

Requiring a companion seat is in fact a scoping requirement, not a technical requirement. In keeping with the approach of including scoping in the IBC, similar to Table 1108.2.2.1 for number of wheelchair spaces and Section 1108.2.4 for number of designated aisle seats, the scoping requirement for one companion seats adjacent to each wheelchair space should be in the IBC. ICC A117.1 will still include the technical details for this seat.

In addition, including this requirement in the IBC will allow for clear distinctions when a companion seat is not required, such as in team and player seating (Section 1108.2.2.4) and jury boxes (Section 1108.2.4.1.1 (Supp)).

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Modified

Modify the proposal as follows:

1108.2.3 Companion seats. At least one companion seat complying with ICC A117.1 shall be provided ~~immediately adjacent to~~ for each wheelchair space required by Section 1108.2.2.1 through 1108.2.2.3.

Committee Reason: The modification is so that the ICC A117.1 will contain all the technical criteria for the companion seat as it is related to the wheelchair space and that only scoping language will be in the IBC. Adding the language in this proposal will clarify where companion seating is required in assembly seating. Companion seating is not required adjacent to wheelchair spaces in team seating, jury boxes, witness boxes, etc.

Assembly Action:

None

Final Hearing Results

E164-07/08

AM

Code Change No: **E166-07/08**

Original Proposal

Sections: 1109.2, 1109.2.2

Proponent: Maureen Traxler, City of Seattle, WA, Department of Planning and Development

Revise as follows:

1109.2 Toilet and bathing facilities. Each toilet ~~rooms~~ room and bathing ~~facilities~~ room shall be accessible. Where a floor level is not required to be connected by an accessible route, the only toilet rooms or bathing ~~facilities~~ rooms provided within the facility shall not be located on the inaccessible floor. At least one of each type of fixture, element, control or dispenser in each accessible toilet room and bathing ~~facility~~ room shall be accessible.

Exceptions:

1. In toilet rooms or bathing facilities accessed only through a private office, not for common or public use and intended for use by a single occupant, any of the following alternatives are allowed:
 - 1.1. Doors are permitted to swing into the clear floor space, provided the door swing can be reversed to meet the requirements in ICC A117.1;
 - 1.2. The height requirements for the water closet in ICC A117.1 are not applicable;
 - 1.3. Grab bars are not required to be installed in a toilet room, provided that reinforcement has been installed in the walls and located so as to permit the installation of such grab bars; and
 - 1.4. The requirement for height, knee and toe clearance shall not apply to a lavatory.
2. This section is not applicable to toilet and bathing ~~facilities~~ rooms that serve dwelling units or sleeping units that are not required to be accessible by Section 1107.
3. Where multiple single-user toilet rooms or bathing ~~facilities~~ rooms are clustered at a single location, at least 50 percent but not less than one room for each use at each cluster shall be accessible.
4. Where no more than one urinal is provided in a toilet room or bathing ~~facility~~ room the urinal is not required to be accessible.
5. Toilet rooms that are part of critical care or intensive care patient sleeping rooms are not required to be accessible.

1109.2.2 Water closet compartment. Where water closet compartments are provided in a toilet room or bathing ~~facility~~ room, at least one wheelchair-accessible compartment shall be provided. Where the combined total water closet compartments and urinals provided in a toilet room or bathing ~~facility~~ room is six or more, at least one ambulatory-accessible water closet compartment shall be provided in addition to the wheelchair-accessible compartment. Wheelchair-accessible and ambulatory-accessible compartments shall comply with ICC A117.1.

Reason: The term “facility” is defined in Section 1102 to include “all or any portion of buildings, structures, site improvements, elements and pedestrian or vehicular routes located on a site”. This proposal replaces this ambiguous, very broad term with a specific term, “room”.

Using the term “bathing room” clarifies that these provisions apply to a specific location rather than the entire site or some undefined portion of the site. For instance, Section 1109.2 requires at least one of each type of fixture in each accessible bathing facility to be accessible. Since “facility” may be all or any portion of a building or a site, Section 1109.2 could be read to say that one accessible shower on a site is adequate. “Room” is much more specific and precise, and expresses the intent of these code provisions. Section 603 of ADAAG, which is very similar to Section 1109.2, also uses the term “bathing room”.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The proposal is editorial, however the addition of ‘each’ does clarify that all toilet rooms are required to be accessible.

Assembly Action:

None

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Maureen Traxler, Department of Planning and Development, City of Seattle, WA, requests Approval as Modified by this public comment.

Modify proposal as follows:

1109.2 Toilet and bathing facilities. Each toilet room and bathing room shall be accessible. Where a floor level is not required to be connected by an accessible route, the only toilet rooms or bathing rooms provided within the facility shall not be located on the inaccessible floor. At least one of each type of fixture, element, control or dispenser in each accessible toilet room and bathing room shall be accessible.

Exceptions:

1. In toilet rooms or bathing ~~facilities~~ rooms accessed only through a private office, not for common or public use and intended for use by a single occupant, any of the following alternatives are allowed:
 - 1.1. Doors are permitted to swing into the clear floor space, provided the door swing can be reversed to meet the requirements in ICC A117.1;

- 1.2. The height requirements for the water closet in ICC A117.1 are not applicable;
- 1.3. Grab bars are not required to be installed in a toilet room, provided that reinforcement has been installed in the walls and located so as to permit the installation of such grab bars; and
- 1.4. The requirement for height, knee and toe clearance shall not apply to a lavatory.
2. This section is not applicable to toilet and bathing rooms that serve dwelling units or sleeping units that are not required to be accessible by Section 1107.
3. Where multiple single-user toilet rooms or bathing rooms are clustered at a single location, at least 50 percent but not less than one room for each use at each cluster shall be accessible.
4. Where no more than one urinal is provided in a toilet room or bathing room the urinal is not required to be accessible.
5. Toilet rooms that are part of critical care or intensive care patient sleeping rooms are not required to be accessible.

(Portions of proposal not shown remain unchanged)

Commenter's Reason: This change was part of the original submittal for this code change proposal, but was inadvertently omitted when the code change monograph was published. It is needed to eliminate the ambiguity of the term "facility", and for consistency with the other changes to Section 1109.2.

Final Hearing Results

E166-07/08

AMPC

Code Change No: E168-07/08

Original Proposal

Section: 1109.2.3; Table [P] 2902.1; [IPC Table 403.1]

Proponent: Tricia Mason, Little People of America

THESE PROPOSALS ARE ON THE AGENDA OF THE IBC MEANS OF EGRESS AND THE IPC CODE DEVELOPMENT COMMITTEES AS 2 SEPARATE CODE CHANGES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IBC MEANS OF EGRESS

Add new text as follows:

1109.2.3 Lavatories. Where lavatories are provided, at least 5 percent, but not less than one shall be accessible. Where the total lavatories provided in a toilet room or bathing facility is six or more, at least one lavatory with enhanced reach ranges in accordance with ICC A117.1, Section 606.5, shall be provided in addition to the accessible lavatory.

PART II – IPC

Revise table as follows:

**IPC TABLE 403.1 (IBC [P] TABLE 2902.1) (SUPP)
MINIMUM NUMBER OF REQUIRED PLUMBING FIXTURES^a
(See Section 2902.2 and 2902.3)**

NO.	CLASSIFICATION	OCCUPANCY	DESCRIPTION	WATER CLOSET (URINALS SEE SECTION 419.2 OF THE INTERNATIONAL PLUMBING CODE)		LAVATORIES ^f		BATHTUBS/SHOWERS	DRINKING FOUNTAIN ^g (SEE SECTION 410.1 OF THE INTERNATIONAL PLUMBING CODE)	OTHER
				MAL E	FEMAL E	MAL E	FEMAL E			

(Portions of table not shown remain unchanged)

CODE CHANGES RESOURCE COLLECTION – INTERNATIONAL BUILDING CODE

- a. The fixtures shown are based on one fixture being the minimum required for the number of persons indicated or any fraction of the number of persons indicated. The number of occupants shall be determined by this code.
- b. Toilet facilities for employees shall be separate from facilities for inmates or patients.
- c. A single-occupant toilet room with one water closet and one lavatory serving not more than two adjacent patient sleeping units shall be permitted where such room is provided with direct access from each patient sleeping unit and with provisions for privacy.
- d. The occupant load for seasonal outdoor seating and entertainment areas shall be included when determining the minimum number of facilities required.
- e. The minimum number of required drinking fountains shall comply with Table 403.1 and Chapter 11 of the *International Building Code*.
- f. Lavatories shall comply with Table 403.1 and Chapter 11 of the *International Building Code*.

Reason: This is coordination with technical requirements in Section 606.5 of the ICC A117.1. The note to the plumbing table is to make the plumbing inspectors aware of the requirement and is similar to approved code change P24-06/07.

In Section 606.5 of the ICC A117.1, the standard provides technical requirements for enhanced reach range lavatories. Studies completed in 1996 by C. Angela Van Etten, former principal delegate for Little People of America to ICC/ANSI A117.1, shows that individuals with dwarfism have a limited obstructed reach depth as shown in the following table:

Obstructed Reach Range Survey of Adults with Dwarfism (August 1996)						
	Inches (mm)	Inches (mm)	Inches (mm)	Inches (mm)	Inches (mm)	Inches (mm)
Reach Depth	.66 (16.764)	2.06 (50.927)	4.74 (120.650)	6.46 (162.560)	9.32 (234.950)	10.89 (279.400)
Reach Height	48 (1220)	46 (1170)	42 (1065)	40 (1015)	36 (915)	34 (865)

Individuals with dwarfism can only reach faucets and soap dispensers up to a reach depth of 11 inches in lavatories with a height of 34 inches. Because faucets and soap dispensers are mostly installed at reach depths greater than 11 inches, little people are unable to wash their hands in public restrooms. This inherently creates a grave sanitary issue for people with dwarfism and the environments they come into contact with. The purpose of this proposal is to seek a scoping provision for the existing provision.

The original proposal was created with industry consultants who advised Little People of America that an 11 inch maximum reach depth for lavatory faucets and soap dispenser controls is technically feasible and does not involve a modification to lavatory dimensions. With the widespread use of electronically activated faucets and the possibility of relocating the faucet controls to the side of the bowl while leaving the spout towards the back, or even mounting the faucet on a sidewall, the possibilities are endless in order to comply with the provision.

It is the intent of Little People of America to see the provision be applicable where there are banks of six or more lavatories in a toilet room. At least one of the six shall comply with the ICC/ANSI A117.1 provision. The installation of a faucet on the side of the bowl within the countertop is not prohibited by code, would allow greater accessibility for all users and can be piped to provide the necessary knee and toe clearance.



“Example of enhanced reach range faucets”

Cost Impact: The proposal has the possibility of increasing the cost of construction.

Analysis: The decision by the Plumbing Code committee to add the note to Table 403.1 is dependant on the Means of Egress Committees decision to add Section 1109.2.3 to the Building Code.

Public Hearing Results

PART I – IBC MEANS OF EGRESS

Committee Action:

Approved as Modified

Modify the proposal as follows:

1109.2.3 Lavatories. Where lavatories are provided, at least 5 percent, but not less than one shall be accessible. Where the total lavatories provided in a toilet room or bathing facility is six or more, at least one lavatory with enhanced reach ranges in accordance with ICC A117.1, ~~Section 606.5~~, shall be provided in addition to the accessible lavatory.

Committee Reason: The modification is to delete the specific reference in ICC A117.1 because a specific reference is not done elsewhere in the IBC. The code does not currently have scoping for limited reach range lavatories. Providing this scoping would address the needs of Little People of America. The proposal will not require an additional fixture in the bathroom, just that one of the lavatories provided within large bathrooms will have limited reach range faucets.

Assembly Action:

None

PART II – IPC

Committee Action:

Disapproved

Committee Reason: There is concern that the orientation of faucets in this manner will cause confusion as to how to operate the faucet for hot water since the code already requires that hot is to be on the left.

Assembly Action:

None

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because public comments were submitted.

Public Comment 2:

Lawrence G. Perry, AIA, representing Building Owners and Managers Association (BOMA) International requests Approval as Modified by this public comment.

Steve Thomas, Colorado Code Consulting, LLC, representing Colorado Chapter of ICC, requests Approval as Modified by this public comment.

Modify proposal as follows:

1109.2.3 Lavatories. Where lavatories are provided, at least 5 percent, but not less than one shall be accessible. Where the total lavatories provided in a toilet room or bathing facility is six or more, at least one lavatory with enhanced reach ranges in accordance with ICC A117.1, ~~Section 606.5~~, shall be provided ~~in addition to the accessible lavatory~~.

Commenter's Reason: (Perry) This public comment seeks to modify the accepted proposal for 'enhanced reach range' lavatories. As approved, the proposal will require that enhanced reach range features be provided at a lavatory other than the accessible lavatory. There is no basis for mandating this restriction; nothing in the 'enhanced reach range' provisions makes a lavatory less accessible for other users. A117.1 enhanced reach range provisions (found at Section 606.5 of the 2003 edition) require only that manually-operated faucet controls and soap dispenser controls be within 11" of the front edge of the lavatory, automatic controls be activated within 11" of the front edge of the lavatory, and that both water flow and soap dispensing be within 11" of the front edge of the lavatory. An otherwise accessible lavatory can meet these criteria without having any negative impact on persons with disabilities. With the ever-increasing use of automatic faucets and soap dispensers, particularly in the larger toilet/bathing facilities (more than 6 lavatories) covered by this change, the 'enhanced reach' fixture may be identical to all the other fixtures. Deleting the mandate that the enhanced reach range be provided at an 'additional' lavatory provides maximum flexibility, and has no negative impact on users of the facility.

Commenter's Reason: (Thomas) In the committee's reason, it states "The proposal will not require an additional fixture in the bathroom, just that one of the lavatories provided within large bathrooms will have limited reach range faucets". The language at the end of the last sentence would contradict the committee's intent. The current language requires the enhanced reach range lavatory **in addition** to the accessible lavatory. So, if one accessible lavatory is required in a toilet room, then another lavatory would be required to be an enhanced reach range lavatory. I believe that one lavatory can serve as both the accessible and enhanced reach range lavatory and not require two different lavatories in a toilet room. The faucet of an enhanced reach range lavatory complies with the reach range requirements for accessible lavatories.

Final Hearing Results

E168-07/08, Part I AMPC2
E168-07/08, Part II D

Code Change No: E171-07/08

Original Proposal

Chapter 35

Proponent: Standards writing organizations as listed below.

Revise standard as follows:

BHMA	Builders Hardware Manufacturers Association 355 Lexington Avenue, 15 th Floor New York, NY 10017-6603
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Standard reference number	Title
A 156.10- <u>2006</u> 2005	Power Operated Pedestrian Doors

Reason: The *CP 28 Code Development Policy*, Section 4.5* requires the updating of referenced standards to be accomplished administratively, and be processed as a Code Change Proposal. In May 2007, a letter was sent to each developer of standards that are referenced in the International Codes, asking them to provide the ICC with a list of their standards in order to update to the current edition. Above is the received list of the referenced standards that are under the maintenance responsibility of the IBC Means of Egress Committee.

***4.5 Updating Standards:** The updating of standards referenced by the Codes shall be accomplished administratively by the appropriate code development committee in accordance with these full procedures except that multiple standards to be updated may be included in a single proposal.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The 2006 edition of BHMA standard is available. The codes should reference the latest edition of the standard.

Assembly Action:

None

Final Hearing Results

E171-07/08 AS

IBC – STRUCTURAL

Code Change No: **S2-07/08**

Original Proposal

Section: 1502.1

Proponent: Mike Ennis, SPRI, Inc.

Revise as follows:

1502.1 General. The following words and terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

BALLAST (Supp). ~~Ballast is any item having weight that is used to hold or steady an object.~~ In roofing, ballast comes in the form of large stones or paver systems or light-weight interlocking paver systems and is used to provide uplift resistance for roofing systems that are not adhered or mechanically attached to the roof deck.

Reason: This code change will remove unnecessary language in the definition of ballast

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The code change improves clarity by removing unnecessary text from the definition of the term ballast.

Assembly Action:

None

Final Hearing Results

S2-07/08

AS

Code Change No: **S4-07/08**

Original Proposal

Section: 1503.1

Proponent: Michael D. Fischer, The Kellen Company, representing the Asphalt Roofing Manufacturer's Association (ARMA)

Revise as follows:

1503.1 General. Roof decks shall be covered with approved roof coverings secured to the building or structure in accordance with the provisions of this chapter. Roof coverings shall be designed, and installed ~~and maintained~~ in accordance with this code and the approved manufacturer's instructions such that the roof covering shall serve to protect the building or structure.

CODE CHANGES RESOURCE COLLECTION – INTERNATIONAL BUILDING CODE

Reason: This proposal is an editorial change that removes a maintenance requirement that falls outside of the scope of the IBC.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: This rewording of Section 1503.1 is largely editorial and it appropriately removes the maintenance requirement from the building code.

Assembly Action:

None

Final Hearing Results

S4-07/08

AS

Code Change No: S6-07/08

Original Proposal

Sections: 1504.1.1, 1507.2.7.1, Table 1507.2.7, (New), 1609.5.2; IRC R905.2.4.1, Table R905.2.4.1 (New), Table R905.2.4.2 (New)

Proponent: Michael D. Fischer, The Kellen Company, representing the Asphalt Roofing Manufacturer’s Association (ARMA)

THESE PROPOSALS ARE ON THE AGENDA OF THE IBC STRUCTURAL AND IRC BUILDING/ENERGY CODE DEVELOPMENT COMMITTEES AS 2 SEPARATE CODE CHANGES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IBC STRUCTURAL

1. Revise as follows:

1504.1.1 (Supp) Wind resistance of asphalt shingles. Asphalt shingles shall ~~be installed in accordance~~ comply with Section 1507.2.7.

1507.2.7.1 (Supp) Wind resistance. Asphalt shingles shall be tested in accordance with ~~either ASTM D 3161 or ASTM D 7158 for wind resistance.~~ Asphalt shingles shall meet the classification requirements of Table 1507.2.7.1(1) for the appropriate maximum basic wind speed. Asphalt shingle packaging shall bear a label to indicate compliance with ASTM D 7158 and the required classification in Table 1507.2.7.1(1).

Exception: Asphalt shingles not included in the scope of ASTM D 7158 shall be tested and labeled to indicate compliance with ASTM D 3161 and the required classification in Table 1507.2.7.1(2).

2. Delete and substitute as follows:

TABLE 1507.2.7 (Supp)
CLASSIFICATION OF ASPHALT ROOF SHINGLES^a

MAXIMUM BASIC WIND SPEED FROM FIGURE 1609	ASTM D 3161	ASTM D 7158^b
85	A, D, or F	D, G or H
90	A, D, or F	D, G or H
100	A, D, or F	G or H
110	F	G or H
120	F	G or H
130	F	H
140	F	H
150	F	H

For SI: 1 foot = 304.8 mm.

- a. Asphalt Shingles shall be tested in accordance with ASTM D 3161 or ASTM D 7158. Refer to this table for selection of the appropriate product classification(s).
- b. The standard calculations contained in ASTM D 7158 assume exposure category B or C and building height of 60 feet or less. Additional calculations are required for conditions outside of these assumptions.

TABLE 1507.2.7.1(1)^a
CLASSIFICATION OF ASPHALT SHINGLES PER ASTM D 7158

MAXIMUM BASIC WIND SPEED FROM FIGURE 1609	CLASSIFICATION REQUIREMENT
85	D, G or H
90	D, G or H
100	G or H
110	G or H
120	G or H
130	H
140	H
150	H

- a. The standard calculations contained in ASTM D 7158 assume exposure category B or C and building height of 60 feet or less. Additional calculations are required for conditions outside of these assumptions.

TABLE 1507.2.7.1(2)
CLASSIFICATION OF ASPHALT SHINGLES PER ASTM D 3161

MAXIMUM BASIC WIND SPEED FROM FIGURE 1609	CLASSIFICATION REQUIREMENT
85	A, D or F
90	A, D or F
100	A, D or F
110	F
120	F
130	F
140	F
150	F

1609.5.2 (Supp) Roof coverings. Roof coverings shall comply with Section 1609.5.1.

Exception: Rigid tile roof coverings that are air permeable and installed over a roof deck complying with Section 1609.5.1 are permitted to be designed in accordance with Section 1609.5.3.

Asphalt shingles installed over a roof deck complying with 1609.5.1 shall be permitted to be designed using ASTM D 7158 to determine comply with the wind resistance requirements of Section 1507.2.7.1.

PART II – IRC BUILDING/ENERGY

1. Delete and substitute as follows:

R905.2.4.1 (Supp) Wind resistance of asphalt shingles. ~~Asphalt shingles shall be installed in accordance with Section R905.2.6. Asphalt shingles shall be tested for wind resistance in accordance with one of the following test standards:~~

- ~~1. ASTM D 3161~~
- ~~2. ASTM D 7158~~

~~Asphalt shingles shall meet the classification requirement of Table 905.2.4.1 for the applicable maximum basic wind speed. Asphalt shingle packaging shall bear a label to indicate compliance with one of the above ASTM test standards and the appropriate classification from Table 905.2.4.1.~~

R905.2.4.1 Wind resistance of asphalt shingles. Asphalt shingles shall be tested in accordance with ASTM D 7158. Asphalt shingles shall meet the classification requirements of Table R905.2.4.1(1) for the appropriate maximum basic wind speed. Asphalt shingle packaging shall bear a label to indicate compliance with ASTM D7158 and the required classification in Table R905.2.4.1(1).

Exception: Asphalt shingles not included in the scope of ASTM D 7158 shall be tested and labeled to indicate compliance with ASTM D 3161 and the required classification in Table R905.2.4.1(2).

TABLE R905.2.4.1 (Supp)
CLASSIFICATION OF ASPHALT ROOF SHINGLES^a

MAXIMUM BASIC WIND SPEED FROM FIGURE 1609	ASTM D 3161	ASTM D 7158^b
85	A,D, or F	D,G or H
90	A,D, or F	D,G or H
100	A,D, or F	G or H
110	F	G or H
120	F	G or H
130	F	H
140	F	H
150	F	H

For SI: 1 foot = 304.8 mm

- a. ~~Asphalt shingles shall be tested in accordance with ASTM D 3161 or ASTM D 7158. Refer to this table for selection of the appropriate product classification(s).~~
- b. ~~The standard calculations contained in ASTM D 7158 assume Exposure Category B or C and a building height of 60 feet or less. Additional calculations are required for conditions outside of these assumptions.~~

TABLE R905.2.4.1(1)
CLASSIFICATION OF ASPHALT SHINGLES PER ASTM D 7158

<u>MAXIMUM BASIC WIND SPEED FROM FIGURE R301.2(4)</u>	<u>CLASSIFICATION REQUIREMENT</u>
<u>85</u>	<u>D, G or H</u>
<u>90</u>	<u>D, G or H</u>
<u>100</u>	<u>G or H</u>
<u>110</u>	<u>G or H</u>
<u>120</u>	<u>G or H</u>
<u>130</u>	<u>H</u>
<u>140</u>	<u>H</u>
<u>150</u>	<u>H</u>

TABLE R905.2.4.1(2)
CLASSIFICATION OF ASPHALT SHINGLES PER ASTM D 3161

<u>MAXIMUM BASIC WIND SPEED FROM FIGURE R301.2(4)</u>	<u>CLASSIFICATION REQUIREMENT</u>
85	A, D or F
90	A, D or F
100	A, D or F
110	F
120	F
130	F
140	F
150	F

Reason: This proposal completes the introduction of ASTM D7158 into the ICC, providing clear scoping for the applicable test standard for wind resistance of asphalt shingles. The reference to shingle compliance in 1504.1.1 provides clear compliance direction and requires the product comply with the appropriate product standard. The new reference in 1507.2.7.1 provides a “default” to ASTM D7158 with an option for products outside the scope of ASTM D3161. This requirement also removes a “dual path” to compliance by testing to either standard. In 1609.5.2, the pointer from the design section to the roofing requirement is complete.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Errata: Add reference to footnote in heading of table as follows:

TABLE 1507.2.7.1(1)
CLASSIFICATION OF ASPHALT SHINGLES PER ASTM D 7158^a

Correct Figure number in first column heading as follows:

TABLE 1507.2.7.1(2)
CLASSIFICATION OF ASPHALT SHINGLES PER ASTM D 3161

MAXIMUM BASIC WIND SPEED FROM FIGURE ~~R301.2(4)~~ 1609

PART I – IBC STRUCTURAL

Committee Action:

Approved as Submitted

Committee Reason: Agreement with the proponent’s reason which indicates that this code change provides clear scoping for the applicable test standard for wind resistance of asphalt shingles. This action will also be consistent with the IRC B & E committee’s action.

Assembly Action:

None

PART II – IRC B/E

Committee Action:

Approved as Submitted

Committee Reason: This change makes testing to ASTM D 7158 as the default for asphalt shingles.

Assembly Action:

None

Final Hearing Results

S6-07/08, Part I

AS

S6-07/08, Part II

AS

Code Change No: S7-07/08

Original Proposal

Section: 1504.2.1

Proponent: Michael D. Fischer, The Kellen Company, representing The Asphalt Roofing Manufacturer’s Association (ARMA)

1. Delete without substitution as follows:

~~**1504.2.1 Alternative test method.** Testing the acceptability of special fastening methods using the methodology in this section is permitted. The wind-induced uplift force on the shingle shall be determined using the method in UL 2390. The resistance of the shingle to the uplift force shall be determined using ASTM D 6381. Shingles passing this test shall be considered suitable for roofs located where the basic wind speed per Figure 1609 is as given in Table 1504.2.1.~~

~~Classification requires that the resistance of the shingle to wind uplift, measured using the method in ASTM D 6381, exceed the calculated load imposed by wind in the applicable zone as determined using UL 2390.~~

~~Classification by this method applies to buildings less than 60 feet (18 288 mm) high and with Wind Exposures B and C only in an Occupancy Category of I or II. Wrappers of shingle bundles that have been qualified using this alternative method shall be labeled with the tested wind classification and reference UL 2390/ASTM D 6381.~~

Reason: This section is incorrectly located; asphalt shingle requirements should not be located within the clay and concrete tile section. Moreover, this text should have been removed in the last cycle as part of FS 191 that added a reference to ASTM D7158, and also struck the Chapter 16 references to UL 2390 and ASTM D6381. Due to the incorrect location of this text in the 2006 IBC, this section was not included in the proposal. This proposal solves both issues. A companion proposal further clarifies the scoping of the wind standards for asphalt shingles.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: This code change removes a misplaced section that is now redundant, due to a code change approved in the previous code development cycle.

Assembly Action:

None

Final Hearing Results

S7-07/08

AS

Code Change No: S9-07/08

Original Proposal

Section: 1504.3.1, Chapter 35 (New)

Proponent: Mark S. Graham, National Roofing Contractors Association, representing Technical Operations Committee of the National Roofing Contractors Association; Phillip J. Smith, FM Approvals

1. Revise as follows:

1504.3.1 Other roof systems. Roof systems with built-up, modified bitumen, fully adhered or mechanically attached single-ply through fastened metal panel roof systems, and other types of membrane roof coverings shall also be tested in accordance with FM 4450, FM 4470 FM 4474, UL 580 or UL 1897.

2. Add standard to Chapter 35 as follows:**FM****4474-04 Evaluating the Simulated Wind Uplift Resistance of Roof Assemblies Using Static Positive and/or Negative Differential Pressures**

Reason: (Graham) This code change proposal removes from the Code reference standards that do not comply with ICC's guidelines for reference standards and replaces them with a similar reference standard that appears to comply with ICC's guidelines.

FM 4450, "Approval Standard for Class 1 Insulated Steel Roof Decks—with Supplements through July 1992," and FM 4470, "Approval Standard for Class 1 Roof Covers," have been identified as not comply with ICC's guidelines for reference standards. Specifically, these standards have not been promulgated according by a consensus procedure and they prescribe a proprietary agency for quality control and testing. ICC acknowledged these shortcomings during testimony on FS193-06/07 and FS194-06/07 regarding this same issue; however, the code development committee was reluctant to withdraw these standards without substitution.

FM 4474, "Evaluating the Simulated Wind Uplift Resistance of Roof Assemblies Using Static Positive and/or Negative Differential Pressures," includes a similar wind test procedure to FM 4450 and FM 4470, but FM 4474 is promulgated through an ANSI process and it does not a proprietary agency for quality control and testing.

The addition of FM 4474 satisfies the code development committee's desire to provide an acceptable substitute for FM 4450 and FM 4470.

(Smith) The purpose of the change is to substitute an equivalent consensus standard for non consensus standards. FM 4450 and 4470 are not consensus documents. The wind uplift criteria of FM 4450 and FM 4470 is identical to that in ANSI/FM Approvals 4474. ANSI/FM Approvals 4474 is a consensus document meeting the ICC criteria for reference standards. A PDF copy of 4474 is attached.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Note: The following analysis was not in the Code Change Proposal book but was posted on the ICC website.

Analysis: Review of proposed new standard FM 4474-04 indicated that, in the opinion of ICC Staff, the standard did comply with ICC standards criteria.

Committee Action:

Approved as Submitted

Committee Reason: Agreement with the proponent's reason which indicates that the new FM 4474 standard provides an acceptable substitute for FM 4450 and FM 4470.

Assembly Action:

None

Final Hearing Results

S9-07/08

AS

Code Change No: S18-07/08

Original Proposal

Sections: 1505.2; IRC R902.1

Proponent: John C. Dean, National Association of State Fire Marshals (NASFM)

THESE PROPOSALS ARE ON THE AGENDA OF THE IBC FIRE SAFETY AND IRC BUILDING/ENERGY CODE DEVELOPMENT COMMITTEES AS 2 SEPARATE CODE CHANGES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IBC FIRE SAFETY

Revise as follows:

1505.2 (Supp) Class A roof assemblies. Class A roof assemblies are those that are effective against severe fire test exposure. Class A roof assemblies and roof coverings shall be listed and identified as Class A by any approved testing agency. Class A roof assemblies shall be permitted for use in buildings or structures of all types of construction.

Exceptions:

1. Class A roof assemblies include those with coverings of brick, masonry, ~~slate, clay or concrete roof tile~~, or an exposed concrete roof deck.
2. Class A roof assemblies also include ferrous or copper shingles or sheets, metal sheets and shingles, clay and concrete roof tile, and slate installed on non-combustible decks.

PART II – IRC BUILDING/ENERGY

R902.1 (Supp) Roofing covering materials. Roofs shall be covered with materials as set forth in Sections R904 and R905. Class A, B or C roofing shall be installed in areas designated by law as requiring their use or when the edge of the roof is less than 3 feet (914 mm) from a property line. Classes A, B and C roofing required to be listed by this section shall be tested in accordance with UL 790 or ASTM E 108.

Exceptions:

1. Class A roof assemblies include those with coverings of brick, masonry, ~~slate, clay or concrete roof tile~~, and exposed concrete roof deck.
2. Class A roof assemblies also include ferrous or copper shingles or sheets, metal sheets and shingles, clay and concrete tile, installed on noncombustible decks.

Reason: (IBC/IRC) This is a follow-up proposal to code change FS199-06/07 that was submitted by the National Association of State Fire Marshals and approved as modified by their public comment at the ICC Final Action Hearings in Rochester, NY. The public comment cited some ASTM E108 (UL790) tests in UL Report file SV16680, Project 07CA03538 “Fact-Finding Investigation of Metal and Slate Prepared Roof Coverings” dated Jan 17, 2007.

It should be noted that during the prior code cycle the automatic Class A designation was removed for steel, copper, and slate. This proposal addresses the same problem and treats clay and concrete tile in the same manner.

This proposal only seeks to remove language and exceptions that automatically confer Class A status to certain materials. It does not eliminate the use of any product. The increasingly wide range of materials and configurations used as clay roofing now available in the market can no longer support a general exemption from fire testing these assemblies. All roof assemblies with clay or concrete tile roof covering should be tested in accordance with ASTM E108 or UL 790. The modification recognizes that clay and concrete tile roof coverings on non-combustible decks do not constitute a hazard.

Under brush fire conditions in the field, roof coverings can be exposed to burning brands that may break slate or clay or concrete roof tile, since they are brittle materials, and expose the roof deck to the fire; or the high winds caused by the brush fire can lift the butt ends of slate or concrete or clay roof tiles, allowing the entry of embers under the roof covering and igniting the combustible deck.

At the Rochester Final Action Hearing, the membership vote made it clear that fire resistance testing is favored over the exceptions based on field experience in past editions of the IBC. This change would also provide a level playing field for all of the roofing materials that would be included in exception 2.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

PART I – IBC FIRE SAFETY

Committee Action:

Approved as Submitted

Committee Reason: The committee agreed that based on the wide range of materials and configurations of concrete and clay roofing products available, all roof assemblies with clay or concrete tile roof covering should be tested in accordance with ASTM E108 or UL 790 to substantiate a Class A roof assembly, unless these products are installed on a noncombustible deck.

Assembly Action:

None

PART II – IRC B/E

Committee Action:

Disapproved

Committee Reason: Based on proponent's request for disapproval in favor of S20-07/08, Part II.

Assembly Action:

None

Final Hearing Results

S18-07/08, Part I	AS
S18-07/08, Part II	D

Code Change No: **S19-07/08**

Original Proposal

Sections: 1505.2; IRC R902.1

Proponent: Kate Dargan, State Fire Marshal, CAL FIRE, representing California Office of the State Fire Marshal

THESE PROPOSALS ARE ON THE AGENDA OF THE IBC FIRE SAFETY AND IRC BUILDING/ENERGY CODE DEVELOPMENT COMMITTEES AS 2 SEPARATE CODE CHANGES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IBC FIRE SAFETY

Revise as follows:

1505.2 (Supp) Class A roof assemblies. Class A roof assemblies are those that are effective against severe fire test exposure. Class A roof assemblies and roof coverings shall be listed and identified as Class A by any approved testing agency. Class A roof assemblies shall be permitted for use in buildings or structures of all types of construction.

Exceptions:

1. Class A roof assemblies include those with coverings of brick, masonry, slate, clay or concrete roof tile, or an exposed concrete roof deck.
2. Class A roof assemblies also include ferrous or copper shingles or sheets, metal sheets and shingles, installed on non-combustible decks or ferrous, copper or metal sheets installed without a roof deck.

PART II – IRC BUILDING/ENERGY

Revise as follows:

R902.1 (Supp) Roofing covering materials. Roofs shall be covered with materials as set forth in Sections R904 and R905. Class A, B or C roofing shall be installed in areas designated by law as requiring their use or when the edge of the roof is less than 3 feet (914 mm) from a property line. Classes A, B and C roofing required to be listed by this section shall be tested in accordance with UL 790 or ASTM E 108.

Exceptions:

1. Class A roof assemblies include those with coverings of brick, masonry, slate, clay or concrete roof tile, and exposed concrete roof deck.
2. Class A roof assemblies also include ferrous or copper shingles or sheets, metal sheets and shingles, installed on noncombustible decks or ferrous, copper or metal sheets installed without a roof deck.

Reason: (IBC) The purpose of this proposal is to add “metal sheets and shingles” to Exception 2 for compatibility with the current text in Section R902.1 of the IRC and to address the condition where roof decking is not needed for support of the roof covering.

The phrase “metal sheets and shingles” is needed to include aluminum or other noncombustible metal roofing.

During the discussion of code change FS199-06/07 at the ICC Public Hearings in Rochester, NY, it was clear that the concern was the flaming of the combustible deck that could cause premature failure of the roofing assembly. Many ferrous, copper and metal roof panels can be installed without the need for a supporting roof deck.

(IRC) The purpose of this proposal is to address the condition where roof decking is not needed for support of the roof covering.

During the discussion of code change FS199-06/07 at the ICC Public Hearings in Rochester, NY, it was clear that the concern was the flaming of the combustible deck that could cause premature failure of the roofing assembly. Many ferrous, copper and metal roof panels can be installed without the need for a supporting roof deck.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

PART I – IBC FIRE SAFETY
Committee Action:

Approved as Modified

Modify the proposal as follows:

1505.2 Class A roof assemblies. Class A roof assemblies are those that are effective against severe fire test exposure. Class A roof assemblies and roof coverings shall be listed and identified as Class A by any approved testing agency. Class A roof assemblies shall be permitted for use in buildings or structures of all types of construction.

Exceptions:

1. Class A roof assemblies include those with coverings of brick, masonry, slate, clay or concrete roof tile, or an exposed concrete roof deck.
2. Class A roof assemblies also include ferrous or copper shingles or sheets, metal sheets and shingles, installed on non-combustible decks or ferrous, copper or metal sheets installed without a roof deck on non-combustible framing.

Committee Reason: The committee agreed that metal sheets and shingles installed on a non-combustible deck and metal sheet roofing installed directly on non-combustible framing without a roof deck achieves a Class A roof assembly, based on data that indicated that flaming of combustible decks/framing caused premature failure of a roof assembly. The modification clarifies that metal sheet roofing that is installed without a roof deck still requires installation on framing that is non-combustible in order to qualify as a Class A roof covering.

Assembly Action:

None

PART II – IRC B/E
Committee Action:

Disapproved

Committee Reason: Based on proponent's request for disapproval in favor of S20-07/08, Part II. Also, ferrous, copper or metal sheets without a roof deck may not be a Class A roof. This issue needs to be reworked.

Assembly Action:

None

Final Hearing Results

S19-07/08, Part I	AM
S19-07/08, Part II	D

Code Change No: S20-07/08

Original Proposal

Sections: 1505.2, IRC R902.1

Proponent: Kate Dargan, State Fire Marshal, CAL FIRE, representing California Office of the State Fire Marshal

THESE PROPOSALS ARE ON THE AGENDA OF THE IBC FIRE SAFETY AND IRC BUILDING/ENERGY CODE DEVELOPMENT COMMITTEES AS 2 SEPARATE CODE CHANGES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IBC FIRE SAFETY

Revise as follows:

1505.2 (Supp) Class A roof assemblies. Class A roof assemblies are those that are effective against severe fire test exposure. Class A roof assemblies and roof coverings shall be listed and identified as Class A by any approved testing agency. Class A roof assemblies shall be permitted for use in buildings or structures of all types of construction.

Exceptions:

1. Class A roof assemblies include those with coverings of brick, masonry, ~~slate, clay or concrete roof tile~~, or an exposed concrete roof deck.
2. Class A roof assemblies also include ferrous or copper shingles or sheets, clay or concrete roof tile, or slate installed on non-combustible decks.

PART II – IRC BUILDING/ENERGY**Revise as follows:**

R902.1 (Supp) Roofing covering materials. Roofs shall be covered with materials as set forth in Sections R904 and R905. Class A, B or C roofing shall be installed in areas designated by law as requiring their use or when the edge of the roof is less than 3 feet (914 mm) from a property line. Classes A, B and C roofing required to be listed by this section shall be tested in accordance with UL 790 or ASTM E 108.

1. Class A roof assemblies include those with coverings of brick, masonry, ~~slate, clay or concrete roof tile~~, and exposed concrete roof deck.
2. Class A roof assemblies also include ferrous or copper shingles or sheets, metal sheets and shingles, clay or concrete roof tile, or slate installed on noncombustible decks.

Reason: (IBC/IRC) This is a follow-up proposal to code change FS199-06/07 that was submitted by the National Association of State Fire Marshals and approved as modified by their public comment at the ICC Final Action Hearings in Rochester, NY. The public comment cited some ASTM E108 (UL790) tests in UL Report file SV16680, Project 07CA03538 “Fact-Finding Investigation of Metal and Slate Prepared Roof Coverings” dated January 17, 2007.

Slate failed the test in less than 15 minutes but is currently included in the exception for materials that are to be considered without testing. The purpose of this proposed change is to require that decks for slate roofing or clay or concrete roof tile be noncombustible or that the roofing assembly pass the ASTM E108 (UL790) external fire and burning brand test.

Under brush fire conditions in the field, roof coverings can be exposed to burning brands that may break slate or clay or concrete roof tile, since they are brittle materials, and expose the roof deck to the fire; or the high winds caused by the brush fire can lift the butt ends of slate or concrete or clay roof tiles, allowing the entry of embers under the roof covering and igniting the combustible deck.

At the Rochester Final Action Hearing, the membership vote made it clear that fire resistance testing is favored over the exceptions based on field experience in past editions of the IBC. This change would also provide a level playing field for all of the roofing materials that would be included in exception 2.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

PART I – IBC FIRE SAFETY**Committee Action:****Approved as Submitted**

Committee Reason: Based on data indicating that certain thicknesses and styles of clay and concrete roofing tiles do not qualify as Class A roof assemblies when installed on combustible decks, the committee agreed that these products should be limited to Class A when installed only on non-combustible decks. When installed on combustible decks, these products need to be tested in accordance with ASTM E108 or UL 790 to substantiate a Class A roof assembly

Assembly Action:**None****PART II – IRC B/E****Committee Action:****Approved as Submitted**

Committee Reason: This change improves the code by requiring these roof materials to be installed on a non-combustible deck. If the materials meet the Class A test they can be installed without a non-combustible deck.

Assembly Action:**None**

Final Hearing Results

S20-07/08, Part I	AS
S20-07/08, Part II	AS

Code Change No: S25-07/08

Original Proposal

Sections: 1507.2.5; IRC R905.2.4

Proponent: Michael D. Fischer, The Kellen Company, representing the Asphalt Roofing Manufacturer’s Association (ARMA)

THESE PROPOSALS ARE ON THE AGENDA OF THE IBC STRUCTURAL AND IRC BUILDING/ENERGY CODE DEVELOPMENT COMMITTEES AS 2 SEPARATE CODE CHANGES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IBC STRUCTURAL

Revise as follows:

1507.2.5 Asphalt shingles. Asphalt shingles shall ~~have self-seal strips or be interlocking and~~ comply with ASTM D 225 or ASTM D 3462. ~~Asphalt shingle packaging shall bear labeling indicating compliance with ASTM D3161 or a listing by an approved testing agency in accordance with the requirements of Section 1609.5.2.~~

PART II – IRC BUILDING/ENERGY

R905.2.4 Asphalt shingles. Asphalt shingles shall ~~have self-seal strips or be interlocking, and~~ comply with ASTM D 225 or D 3462.

Reason: This proposal provides a correlation fix, and removes redundant language. The prescriptive text regarding self seal strips is inappropriate. The labeling requirement already occurs within Chapter 15. The self-seal strip or interlocking terms are not defined, and are unnecessary with the introduction of requirements for testing to ASTM D7158 and ASTM D3161. Removing the terms defers appropriately to the test standards and the performance requirements.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

PART I – IBC STRUCTURAL

Committee Action:

Approved as Submitted

Committee Reason: This proposal clarifies the original intent of Section 1507.2.5 by removing unnecessary wording.

Assembly Action:

None

PART II – IRC B/E

Committee Action:

Approved as Submitted

Committee Reason: This change eliminates redundancy in the code. The self seal strips or interlocking are already addressed in the test standards referenced in other sections of the code.

Assembly Action:

None

Final Hearing Results

S25-07/08, Part I AS
S25-07/08, Part II AS

Code Change No: S27-07/08

Original Proposal

Section: 1507.2.9.2

Proponent: Michael D. Fischer, The Kellen Company, representing the Asphalt Roofing Manufacturer's Association (ARMA)

Revise as follows:

1507.2.9.2 (Supp) Valleys. Valley linings shall be installed in accordance with the manufacturer's instructions before applying shingles. Valley linings of the following types shall be permitted:

1. For open valleys (valley lining exposed) lined with metal, the valley lining shall be at least ~~46~~ 24 inches (~~406~~ 610 mm) wide and of any of the corrosion-resistant metals in Table 1507.2.9.2.
2. For open valleys, valley lining of two plies of mineral-surfaced roll roofing complying with ASTM D 3909 or ASTM D 6380 shall be permitted. The bottom layer shall be 18 inches (457 mm) and the top layer a minimum of 36 inches (914 mm) wide.
3. For closed valleys (valleys covered with shingles), valley lining of one ply of smooth roll roofing complying with ASTM D 6380, and at least 36 inches (914 mm) wide or types as described in Items 1 or 2 above shall be permitted. Self-adhering polymer modified bitumen underlayment complying with ASTM D 1970 shall be permitted in lieu of the lining material.

Reason: The IBC and IRC currently contain differing provisions for the width of exposed valley linings. This change to modify the minimum required width for exposed valley lining brings consistency between the codes and improve the weather protection performance of asphalt roofing. The 24" requirement is consistent with the Asphalt Roofing Manufacturing Association (ARMA) recommendation, reflects industry standard product widths, and will provide consistency between the IRC and IBC.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:**Approved as Submitted**

Committee Reason: The increased valley lining width is consistent with current industry installation practices.

Assembly Action:**None**

Final Hearing Results

S27-07/08**AS**

Code Change No: **S30-07/08**

Original Proposal

Sections: 1507.4.4; IRC R905.10.4

Proponent: Craig Thompson, Copper Development Association

THESE PROPOSALS ARE ON THE AGENDA OF THE IBC STRUCTURAL AND IRC BUILDING/ENERGY CODE DEVELOPMENT COMMITTEES AS 2 SEPARATE CODE CHANGES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IBC STRUCTURAL

Revise as follows:

1507.4.4 Attachment. Metal roof panels shall be secured to the supports in accordance with the approved manufacturer's fasteners. In the absence of manufacturer recommendations, the following fasteners shall be used:

1. Galvanized fasteners shall be used for steel roofs.
2. Copper, Brass, Bronze, copper alloy and 300 series stainless-steel fasteners shall be used for copper roofs.
3. Stainless-steel fasteners are acceptable for all types of metal roofs.

PART II – IRC BUILDING/ENERGY

Revise as follows:

R905.10.4 Attachment. Metal roof panels shall be secured to the supports in accordance with this chapter and the manufacturer's installation instructions. In the absence of manufacturer's installation instructions, the following fasteners shall be used:

1. Galvanized fasteners shall be used for steel roofs.
2. Copper, Brass, Bronze, copper alloy and Three hundred series stainless steel fasteners shall be used for copper roofs.
3. Stainless steel fasteners are acceptable for metal roofs.

Reason: (IBC) This change is being submitted to overcome an omission in the code regarding industry recommended fastener materials for use with copper and copper alloy roof systems. Traditionally, copper and copper alloy roofs have been installed using only copper alloy fasteners (copper, brass, bronze, etc.) in order to avoid issues related to dissimilar metal or galvanic corrosion problems between the copper alloy roof material and the fastener. More recently, stainless steel fasteners have also been allowed, and are acceptable in addition to copper and copper alloy fasteners, not in exclusion of those fasteners. As currently written, this section of the code is unnecessarily restrictive. As shown in the three references listed below, copper and copper alloy fasteners remain the industry recommended materials in addition to stainless steel for installing copper and copper alloy roofs.

Reference Publications:

The following publications list the types of fasteners to be used with copper roofs:

- A. SMACNA's "Architectural Sheet Metal Manual"
- B. Revere's "Copper and Common Sense"
- C. Copper Development Association's "Copper in Architecture"

(IRC) This change is being submitted to overcome an omission in the code regarding industry recommended fastener materials for use with copper and copper alloy roof systems. Traditionally, copper and copper alloy roofs have been installed using only copper alloy fasteners (copper, brass, bronze, etc.) in order to avoid issues related to dissimilar metal or galvanic corrosion problems between the copper alloy roof material and the fastener. More recently, stainless steel fasteners have also been allowed, and are acceptable in addition to copper and copper alloy fasteners, not in exclusion of those fasteners. As currently written, this section of the code is unnecessarily restrictive. As shown in the three references listed below, copper and copper alloy fasteners remain the industry recommended materials in addition to stainless steel for installing copper and copper alloy roofs.

Reference Publications:

The following publications list the types of fasteners to be used with copper roofs:

- A. SMACNA's "Architectural Sheet Metal Manual"
- B. Revere's "Copper and Common Sense"
- C. Copper Development Association's "Copper in Architecture"

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

**PART I – IBC STRUCTURAL
Committee Action:**

Approved as Modified

Modify proposal as follows:

1507.4.4 Attachment. Metal roof panels shall be secured to the supports in accordance with the approved manufacturer's fasteners. In the absence of manufacturer recommendations, the following fasteners shall be used:

1. Galvanized fasteners shall be used for steel roofs.
2. Copper, Brass, Bronze, copper alloy ~~and~~ or 300 series stainless-steel fasteners shall be used for copper roofs.
3. Stainless-steel fasteners are acceptable for all types of metal roofs.

Committee Reason: The proposal allows fasteners for copper roofs that are possibly excluded by the current verbiage. The modification uses "or" in place of "and" since the fasteners listed are options.

Assembly Action:

None

**PART II – IRC B/E
Committee Action:**

Approved as Submitted

Committee Reason: This change adds acceptable fasteners for copper roofs in absence of manufacturer's recommendations.

Assembly Action:

None

Final Hearing Results

S30-07/08, Part I	AM
S30-07/08, Part II	AS

Code Change No: S33-07/08

Original Proposal

Section: 1507.11.2, Chapter 35 (New)

Proponent: Kenneth R. Hunt, Performance Roof Systems, Inc., representing himself

1. Revise as follows:

1507.11.2 Material standards. Modified bitumen roof coverings shall comply with CGSB 37-GP-56M, ASTM D 6162, ASTM D 6163, ASTM D 6164, ASTM D 6222, ASTM D 6223, or ASTM D 6298 and ASTM D 6509.

2. Add standard to Chapter 35 as follows:

ASTM

D 6509-00 Standard Specification for Atactic Polypropylene (APP) Modified Bituminous Base Sheet Materials Using Glass Fiber Reinforcements

Reason: 1) The inclusion of ASTM D 6509 is to revise the current material standards to include all current ASTM Modified Bitumen roof covers. 2) The current code does not include the approval of an ASTM D 6509 APP Modified Bitumen Membrane thus restricting the use of a modified base sheet/ply to SBS only. 3) See attached copy of ASTM 6509.

Cost Impact: The code change proposal will not increase the cost of construction. The inclusion of ASTM D 6509 into the code will not increase cost of construction.

Public Hearing Results

Note: The following analysis was not in the Code Change Proposal book but was posted on the ICC website.

Analysis: Review of proposed new standard ASTM D 6509-00 indicated that, in the opinion of ICC Staff, the standard did not comply with ICC standards criteria, Section 3.6.2.1.

Committee Action:

Approved as Modified

Modify proposal as follows:

1507.11.2 Material standards. Modified bitumen roof coverings shall comply with CGSB 37-GP-56M, ASTM D 6162, ASTM D 6163, ASTM D 6164, ASTM D 6222, ASTM D 6223, ASTM D 6298 ~~and~~ or ASTM D 6509.

(Portions of proposal not shown remain unchanged)

Committee Reason: Including a reference to ASTM D 6509 improves the code by providing access to another product. The modification is editorial to keep the intent of the code the same.

Assembly Action:

None

Final Hearing Results

S33-07/08

AM

Code Change No: S34-07/08

Original Proposal

Sections: 1507.12.3, 1507.13.3, Chapter 35 (New)

Proponent: Mark S. Graham, National Roofing Contractors Association, representing Technical Operations Committee of the National Roofing Contractors Association

1. Revise as follows:

1507.12.3 (Supp) Ballasted thermoset low slope roofs. Ballasted thermoset low slope roofs (<2:12) shall be installed in accordance with this section and Section 1504.4. Stone used as ballast shall comply with ASTM D448.

1507.13.3 (Supp) Ballasted thermoplastic low slope roofs. Ballasted thermoplastic low slope roofs (<2:12) shall be installed in accordance with this section and Section 1504.4. Stone used as ballast shall comply with ASTM D448.

2. Add standard to Chapter 35 as follows:

ASTM

D 448-03a Standard Classification for Sizes of Aggregate for Road and Bridge Construction

Reason: This proposed code change is intended to clarify the intent of the Code's current requirements for ballasted single-ply membrane roof systems by providing specific requirements for stone ballast. ASTM D448 is already included in ANSI/SPRI RP-4, which is referenced in Sec. 1504.4, as a requirement for the size gradation of stone used as ballast. The proposed code change does not change the Code's size gradation requirement. It only includes it within the Code's text for ease of compliance and enforcement.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: A review of the standard proposed for inclusion in the code, ASTM D488, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before January 15, 2008.

Public Hearing Results

Note: The following analysis was not in the Code Change Proposal book but was posted on the ICC website.

Analysis: Review of proposed new standard ASTM D 448 indicated that, in the opinion of ICC Staff, the standard did comply with ICC standards criteria.

Committee Action:

Approved as Submitted

Committee Reason: The proposal adds a needed clarification for stone that is used as ballast.**Assembly Action:**

None

Final Hearing Results

S34-07/08

AS

Code Change No: S35-07/08

Original Proposal

Sections: 1507.14.2; IRC R905.14.2**Proponent:** Mason Knowles, Mason Knowles Consulting LLC, representing himself

THESE PROPOSALS ARE ON THE AGENDA OF THE IBC STRUCTURAL AND IRC BUILDING/ENERGY CODE DEVELOPMENT COMMITTEES AS 2 SEPARATE CODE CHANGES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IBC STRUCTURAL**Revise as follows:**

1507.14.2 Material standards. Spray-applied polyurethane foam insulation shall comply with Types III and IV as defined in ASTM C 1029.

PART II – IRC BUILDING/ENERGY**Revise as follows:**

R905.14.2 Material standards. Spray-applied polyurethane foam insulation shall comply with Types III and IV as defined in ASTM C 1029.

Reason: This code change corrects a mistake made a few years ago. Originally this code change referenced types III and IV as spray foams acceptable for SPF roofing applications but in the 2004 supplement, the reference to types III and IV were deleted.

ASTM C 1029 classifies spray polyurethane foam into 4 types based on minimum compressive strength. Types I & II compressive strengths are 15 and 25 respectively. Types I and II as defined by ASTM C 1029 are not suitable for spray polyurethane foam roofing systems. Types III and IV compressive strengths are 40 and 60 psi respectively.

ASTM D 5469, Standard Guideline for New Spray Polyurethane Foam Roofing Systems and technical documents SPFA list the minimum compressive strength for spray polyurethane roofing systems as 40 psi which would correspond to types III and IV in ASTM C 1029.

Cost Impact: The code change will not increase the cost of construction.

Public Hearing Results

PART I – IBC STRUCTURAL**Committee Action:**

Approved as Modified

Modify proposal as follows:

1507.14.2 Material standards. Spray-applied polyurethane foam insulation shall comply with Types III ~~and~~ or IV as defined in ASTM C 1029.

Committee Reason: This code change establishes product standards. The modification is editorial and makes it clear that the insulation should comply with one or the other rather than both.

Assembly Action:

None

**PART II – IRC B/E
Committee Action:**

Approved as Submitted

Committee Reason: This change provides the correct reference to the types of acceptable spray polyurethane insulation, as well as correcting an omission.

Assembly Action:

None

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Mark S. Graham, National Roofing Contractors Association (NRCA), Technical Operations Committee of the National Roofing Contractors Association, requests Approval as Modified by this Public Comment for Part II.

Modify proposal as follows:

R905.14.2 Material standards. Spray-applied polyurethane foam insulation shall comply with Types III ~~and~~ or IV as defined in ASTM C 1029.

Commenter's Reason: This modification is intended to make the IRC language consistent with the action taken by the IBC Structural Committee on the same item (Part I) and maintain consistency between the IBC and IRC.

An "or" is appropriate here to permit the use of either Type III or Type IV. Type III provides for SPF with a minimum compressive strength of 40 psi, while Type IV provides for a minimum compressive strength of 60 psi. Both 40 PSI and 60 psi SPF are appropriate for roofing applications.

Final Hearing Results

S35-07/08, Part I
S35-07/08, Part II

AM
AMPC

Code Change No: **S37-07/08**

Original Proposal

Sections: 1507.15.2, Chapter 35 (New); IRC R905.15.2, Chapter 43 (New)

Proponent: Mason Knowles, Mason Knowles Consulting LLC, representing himself

THESE PROPOSALS ARE ON THE AGENDA OF THE IBC STRUCTURAL AND IRC BUILDING/ENERGY CODE DEVELOPMENT COMMITTEES AS 2 SEPARATE CODE CHANGES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IBC STRUCTURAL

1. Revise as follows:

1507.15 Liquid-applied coatings. The installation of liquid-applied coatings shall comply with the provisions of this section.

1507.15.1 Slope. Liquid-applied roofs shall have a design slope of a minimum of one-fourth unit vertical in 12 units horizontal (2-percent slope).

1507.15.2 Material standards. Liquid-applied roof coatings shall comply with ASTM C 836, ASTM C 957, ASTM D 1227 or ASTM D 3468, ASTM D 6083, ASTM D 6694, or ASTM D 6947.

2. Add standard to Chapter 35 as follows:**ASTM**

D 6947-07 Standard Specification for Liquid Applied Moisture Cured Polyurethane Coating Used in Spray Polyurethane Foam Roofing System

PART II – IRC BUILDING/ENERGY**1. Revise as follows:**

R905.15 Liquid-applied coatings. The installation of liquid applied coatings shall comply with the provisions of this section.

R905.15.1 Slope. Liquid-applied roofs shall have a design slope of a minimum of one-fourth unit vertical in 12 units horizontal (2-percent slope).

R905.15.2 Material standards. Liquid-applied roof coatings shall comply with ASTM C 836, C 957, D 1227, D 3468, D 6083, D 6694, or ASTM D 6947.

R905.15.3 Application. Liquid-applied roof coatings shall be installed according to this chapter and the manufacturer's installation instructions.

2. Add standard to Chapter 43 as follows:**ASTM**

D 6947-07 Standard Specification for Liquid Applied Moisture Cured Polyurethane Coating Used in Spray Polyurethane Foam Roofing System

Reason: Moisture cured polyurethane coatings are widely used in the SPF industry and this code change would specifically allow the use of a viable alternative to the coatings already referenced in IBC section 1507.15.2 and IRC section R905.15.2

The code change allows the use of moisture cured polyurethane coatings over spray polyurethane foam roof systems meeting the ASTM standard 6947.

ASTM D 6947, is a new ASTM standard adopted in 2006 to describe liquid-applied moisture cured polyurethane coatings that are used in spray polyurethane foam roofing.

Cost Impact: The code change will not increase the cost of construction.

Analysis: A review of the standard proposed for inclusion in the code, ASTM D6947, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before January 15, 2008.

Public Hearing Results

Note: The following analysis was not in the Code Change Proposal book but was posted on the ICC website.

Analysis: Review of proposed new standard ASTM D 6947-07 indicated that, in the opinion of ICC Staff, the standard did comply with ICC standards criteria.

PART I – IBC STRUCTURAL**Committee Action:****Approved as Submitted**

Committee Reason: The addition of ASTM D 6947 clarifies code requirements for liquid-applied coatings.

Assembly Action:**None****PART II – IRC B/E****Committee Action:****Approved as Submitted**

Committee Reason: This change allows more options for the roofing industry and provides more options for spray polyurethane foam.

Assembly Action:**None**

Final Hearing Results

S37-07/08, Part I	AS
S37-07/08, Part II	AS

Code Change No: **S42-07/08**

Original Proposal

Sections: 1502.1, 1509.2, 1509.2.1 through 1509.2.3, 1509.2.4 (New)

Proponent: Sarah A. Rice, CBO, Schirmer Engineering Corporation

THESE PROPOSALS ARE ON THE AGENDA OF THE IBC GENERAL AND IBC MEANS OF EGRESS CODE DEVELOPMENT COMMITTEES AS 2 SEPARATE CODE CHANGES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IBC GENERAL

Revise as follows:

SECTION 1502 DEFINITIONS

PENTHOUSE. An enclosed, unoccupied structure above the roof of a building, other than a tank, tower, spire, dome cupola or bulkhead, ~~occupying not more than one-third of the roof area.~~

1509.2 Penthouses. A penthouse or penthouses in compliance with Section 1509.2 shall not be considered as a portion of the story below.

1509.2.1 Height above roof. A penthouse or other projection above the roof in structures of other than Type I construction shall not exceed 28 feet (8534 mm) above the roof where used as an enclosure for tanks or for elevators that run to the roof and in all other cases shall not extend more than 18 feet (5486 mm) above the roof.

1509.2.2 Area limitation. The aggregate area of penthouses and other rooftop structures shall not exceed one-third the area of the supporting roof. Such penthouses shall not contribute to either the building area or number of stories as regulated by Section 503.1. The area of the penthouse shall not be included in determining the fire area defined in Section 702.

1509.2.3 Use limitations. A penthouse, bulkhead or any other similar projection above the roof shall not be used for purposes other than shelter of mechanical equipment or shelter of vertical shaft openings in the roof. Provisions such as louvers, louver blades or flashing shall be made to protect the mechanical equipment and the building interior from the elements. Penthouses or bulkheads used for purposes other than permitted by this section shall conform to the requirements of this code for an additional story. The restrictions of this section shall not prohibit the placing of wood flagpoles or similar structures on the roof of any building.

PART II – IBC MEANS OF EGRESS

Add new text as follows:

1509.2.4 Egress. Each occupant of a penthouse shall have access to at least two independent means of egress where the common path of egress travel exceeds the limitations of Section 1014.3. Where a stairway provides a means of exit access from a penthouse, the maximum travel distance includes the distance traveled on the stairway measured in the plane of the tread nosing. Accessible means of egress shall be provided in accordance with Section 1007.

Exception: A single means of egress shall be permitted in accordance with Section 1015.1.

(Re-number subsequent sections)

Reason: This proposal seeks to clean up the provisions on penthouses so that among other things:

- code requirements are not in the definition,

- it is clear on what kind of means of egress is to be provided,
- it is clear what types of means of egress must be available.
- A penthouse is similar to a mezzanine in many ways, thus much of the proposed language is similar to what is found in the provisions for mezzanines in Section 505.

The only element that will vary for these tenant spaces is how they contribute to the design of the means of egress system of the covered mall building. All other elements remain the same, e.g., fire alarm, sprinkler, etc.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

PART I – IBC GENERAL

Committee Action:

Approved as Modified

Modify the proposal as follows:

1509.2 Penthouses. A penthouse or penthouses in compliance with Sections ~~1509.2~~ 1509.2.1 through 1509.2.3 shall ~~not~~ be considered as a portion of the story below.

(Portions of proposal not shown remain unchanged)

Committee Reason: Clarifies application of the provisions for penthouses and removes requirements from the definition of penthouse. The modification simply revises the phrase “in compliance with section 1509.2” to “in compliance with Section 1509.2.1 through 1509.2.3” to clarify the applicability of the subsections and be consistent with code style. Additionally the term “not” in section 1509.2 was deleted as it would nullify the revisions the proponent intended.

Assembly Action:

None

PART II – IBC MEANS OF EGRESS

Committee Action:

Disapproved

Committee Reason: The proposal is too restrictive. The definition for means of egress deals with occupied spaces; therefore, since penthouses are considered unoccupied spaces, this could be a possible conflict. A penthouse typically has a very low or no occupants – the proposal would result in two means of egress being required for a penthouse. In addition, this requirement could result in at least two stairways to extend to the roof.

Assembly Action:

None

Final Hearing Results

S42-07/08, Part I
S42-07/08, Part II

AM
D

Code Change No: **S47-07/08**

Original Proposal

Sections: 1603.1, 1603.1.6 (New), 1802.6

Proponent: Edwin T. Huston, Smith & Huston, Inc., representing National Council of Structural Engineering Associations

1. Revise as follows:

1603.1 General. Construction documents shall show the size, section and relative locations of structural members with floor levels, column centers and offsets dimensioned. The design loads and other information pertinent to the structural design required by Sections 1603.1.1 through ~~1603.1.8~~ 1603.1.9 shall be indicated on the construction documents.

Exception: Construction documents for buildings constructed in accordance with the conventional light-frame construction provisions of Section 2308 shall indicate the following structural design information:

1. Floor and roof live loads.
2. Ground snow load, *P_g*.

3. Basic wind speed (3-second gust), miles per hour (mph) (km/hr) and wind exposure.
4. Seismic design category and site class.
5. Flood design data, if located in flood hazard areas established in Section 1612.3.
6. Design load-bearing values of soils.

2. Add new text as follows:

1603.1.6 Geotechnical information. The soil classification and design load-bearing values shall be shown on the construction documents.

(Renumber subsequent sections)

Revise as follows:

1802.6 Reports. ~~The soil classification and design load-bearing capacity shall be shown on the construction documents.~~ Where required by the building official, a written report of the investigation shall be submitted that includes, but need not be limited to, the following information:

1. A plot showing the location of test borings and/or excavations.
2. A complete record of the soil samples.
3. A record of the soil profile.
4. Elevation of the water table, if encountered.
5. Recommendations for foundation type and design criteria, including but not limited to: bearing capacity of natural or compacted soil; provisions to mitigate the effects of expansive soils; mitigation of the effects of liquefaction, differential settlement and varying soil strength; and the effects of adjacent loads.
6. Expected total and differential settlement.
7. Pile and pier foundation information in accordance with Section 1808.2.2.
8. Special design and construction provisions for footings or foundations founded on expansive soils, as necessary.
9. Compacted fill material properties and testing in accordance with Section 1803.5.

Reason: Code clarification. Moves the requirement to show “soil classification and design load-bearing capacity” on the construction documents to the appropriate section. Since the requirement presently exists for all structures, it must apply to both the general case and the conventional light-frame construction case. Even in the simplest case, where the presumptive load-bearing values are used, some classification and design load-bearing capacities are known. In the exceptional case where Section 2308 is being used, the soil classification may be irrelevant, so the requirement is relaxed to reduce the burden on designers.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Modified

Modify proposal as follows:

1603.1.6 Geotechnical information. ~~The soil classification and design load-bearing values~~ of soils shall be shown on the construction documents.

(Portions of proposal not shown remain unchanged)

Committee Reason: This proposal relocates information that is already in the code to a more appropriate section in Chapter 16, resulting in a clarification of requirements for construction documents. The modification removes “soils classification” in recognition that in some instances the allowable soil pressure may be determined without borings. Where a soils report is performed it is still part of the submittals required by Chapter 1.

Assembly Action:

None

Final Hearing Results

S47-07/08

AM

Code Change No: S48-07/08

Original Proposal

Sections: 1603.2, 1603.3, 1603.4, 106 (New)

Proponent: Philip Brazil, PE, SE, Reid Middleton, representing himself

Revise as follows:

SECTION 106
FLOOR AND ROOF DESIGN LOADS

1603.2 106.1 Restrictions on loading. It shall be unlawful to place, or cause or permit to be placed, on any floor or roof of a building, structure or portion thereof, a load greater than is permitted by these requirements.

1603.3 106.2 Live loads posted. Where the live loads for which each floor or portion thereof of a commercial or industrial building is or has been designed to exceed 50 psf (2.40 kN/m²), such design live loads shall be conspicuously posted by the owner in that part of each story in which they apply, using durable signs. It shall be unlawful to remove or deface such notices.

1603.4 106.3 Occupancy permits for changed loads. Occupancy permits for buildings hereafter erected shall not be issued until the floor load signs, required by Section ~~1603.3~~ 106.2, have been installed.

(Renumber subsequent sections)

Reason: Chapter 16 governs the structural design of buildings and structures and consists primarily of provisions for the determination of minimum structural design loads. Section 1603, in particular contains requirements for specifying in the construction documents design loads for each building or structure. Sections 1603.2 through 1603.4, however, are concerned with restrictions on the loads imposed on floors and roofs, the posting of live loads and withholding of the issuance of occupancy permits until live load signs are posted. These particular provisions are more related to the enforcement of codes and standards by building officials rather than the specification of structural design loads. They are better located in the administrative provisions of Chapter 1 rather than in the structural design provisions of Chapter 16.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The requirements for posting live loads do not belong in the structural design chapter. This proposal relocates them more appropriately to the administrative requirements in Chapter 1.

Assembly Action:

None

Final Hearing Results

S48-07/08

AS

Code Change No: **S50-07/08**

Original Proposal

Table 1604.3; IRC Table R301.7

Proponent: Daniel J. Walker, PE, Thomas Associates, Inc., representing National Sunroom Association

THESE PROPOSALS ARE ON THE AGENDA OF THE IBC STRUCTURAL AND IRC BUILDING/ENERGY CODE DEVELOPMENT COMMITTEES AS 2 SEPARATE CODE CHANGES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IBC STRUCTURAL

Revise table footnotes as follows:

**TABLE 1604.3
DEFLECTION LIMITS^{a, b, c, h, i}**

- h. For aluminum structural members or aluminum panels used in skylights and sloped glazing framing, roofs or walls of sunroom additions or patio covers, not supporting edge of glass or aluminum sandwich panels, the total load deflection shall not exceed $L/60$. For continuous aluminum structural members supporting edge of glass, the total load deflection shall not exceed $L/175$ for each glass lite or $L/60$ for the entire length of the member, whichever is more stringent. For aluminum sandwich panels used in roofs or walls of sunroom additions or patio covers, the total load deflection shall not exceed $L/120$.

(Portions of table and footnotes not shown remain unchanged)

PART II – IRC BUILDING/ENERGY

Revise table footnotes as follows:

**TABLE R301.7 (Supp)
ALLOWABLE DEFLECTION OF STRUCTURAL MEMBERS^{a,b,c}**

- c. For aluminum structural members or panels used in roofs or walls of sunroom covers, not supporting edge of glass or sandwich panels, the total load deflection additions or patio shall not exceed $L/60$. For continuous aluminum structural members supporting edge of glass, the total load deflection shall not exceed $L/175$ for each glass lite or $L/60$ for the entire length of the member, whichever is more stringent. For sandwich panels used in roofs or walls of sunroom additions or patio covers, the total load deflection shall not exceed $L/120$.

(Portions of table and footnotes not shown remain unchanged)

Reason: The proposed modification provides clarification that the deflection limit for any edge of glass application shall not exceed $L/175$. The way the code currently reads is ambiguous and does not specifically reference the $L/175$ limit from ASTM E 1300, "Standard Practice for Determining Load Resistance of Glass in Buildings", which is referenced in IBC Chapter 24 and is widely accepted in the glazing industry. The added language improves code enforcement by including this important deflection limit.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

PART I – IBC STRUCTURAL

Committee Action:

Approved as Submitted

Committee Reason: This code change provides clarity because the deflection limit currently exists in ASTM E 1300. Adding the limitation to footnote "h" makes it more apparent to the code user.

Assembly Action:

None

**PART II – IRC B/E
Committee Action:**

Approved as Submitted

Committee Reason: The proposal provides clarification that the deflection limit for any edge of glass application shall not exceed L/175. The current code language does not specifically reference the L/175 limit from ASTM E 1300, “Standard Practice for Determining Load Resistance of Glass in Buildings”, which is referenced in IBC Chapter 24 and is widely accepted in the glazing industry.

Assembly Action:

None

Final Hearing Results

S50-07/08, Part I	AS
S50-07/08, Part II	AS

Code Change No: S51-07/08

Original Proposal

Section: 1604.3.3**Proponent:** Bonnie Manley, American Iron and Steel Institute, representing American Iron and Steel Institute**Revise as follows:**

1604.3.3 Steel. The deflection of steel structural members shall not exceed that permitted by AISC 360, AISI S100 ~~NAS, AISI General, AISI Truss~~, ASCE 3, ASCE 8, SJI JG-1.1, SJI K-1.1 or SJI LH/DLH-1.1, as applicable.

Reason: This code change proposal updates the reference to AISI's *North American Specification for the Design of Cold-Formed Steel Structural Members*, 2007 edition, which has been given the new number designation of AISI S100. It also deletes the references to AISI General and AISI Truss, since neither document addresses deflection of cold-formed steel light frame construction from a serviceability standpoint. AISI S100 handles deflection criteria for cold-formed steel members.

Please see companion change to IBC Section 2209.1 for a summary of changes to AISI S100-07.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: This proposal updates the steel deflection requirements for consistency with the current standards that are referenced for steel construction.

Assembly Action:

None

Final Hearing Results

S51-07/08	AS
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Code Change No: **S52-07/08**

Original Proposal

Sections: 1604.5, 1604.5.1

Proponent: Philip Brazil, PE, SE, Reid Middleton, representing himself

Revise as follows:

1604.5 Occupancy category. Buildings and structures shall be assigned an occupancy ~~category~~ categories in accordance with Table 1604.5.

1604.5.1 Multiple occupancies. Where a building or structure is occupied by two or more occupancies not included in the same occupancy category, ~~the structure~~ it shall be assigned the classification of the highest occupancy category corresponding to the various occupancies. Where buildings or structures have two or more portions that are structurally separated, each portion shall be separately classified. Where a separated portion of a building or structure provides required access to, required egress from or shares life safety components with another portion having a higher occupancy category, both portions shall be assigned to the higher occupancy category.

Reason: Table 1604.5 consistently references buildings and structures in assigning occupancy categories. Section 1604.5, however, references buildings but not structures. Section 1604.5.1 references structures but not buildings. The purpose of this proposal is to correct these oversights so that Sections 1604.5 and 1604.5.1 are consistent with Table 1604.5.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Modified

Modify proposal as follows:

1604.5 Occupancy category. Each buildings and structures shall be assigned an occupancy ~~category~~ category in accordance with Table 1604.5.

1604.5.1 Multiple occupancies. Where a building or structure is occupied by two or more occupancies not included in the same occupancy category, it shall be assigned the classification of the highest occupancy category corresponding to the various occupancies. Where buildings or structures have two or more portions that are structurally separated, each portion shall be separately classified. Where a separated portion of a building or structure provides required access to, required egress from or shares life safety components with another portion having a higher occupancy category, both portions shall be assigned to the higher occupancy category.

Committee Reason: This code change provides terminology that is more consistent with Table 1604.5 and thus improves understanding of this provision. The modification makes further adjustments that are consistent with that intent.

Assembly Action:

None

Final Hearing Results

S52-07/08

AM

Code Change No: **S57-07/08**

Original Proposal

Section: 1604.8.2

Proponent: Joseph J. Messersmith, Jr., PE, Portland Cement Association, representing Portland Cement Association

Revise as follows:

1604.8.2 Concrete and masonry Walls. ~~Concrete and masonry Walls shall be anchored to floors, roofs and other structural elements that provide lateral support for the wall. Such anchorage shall provide a positive direct connection capable of resisting the horizontal forces specified in this chapter but not less than a the minimum strength design horizontal force of 280 plf (4.10 kN/m) of wall specified in Section 11.7.3 of ASCE 7, substituted for "E" in the load combinations of Section 1605.2 or 1605.3. Concrete and masonry walls shall be designed to resist bending between anchors where the anchor spacing exceeds 4 feet (1219 mm). Required anchors in masonry walls of hollow units or cavity walls shall be embedded in a reinforced grouted structural element of the wall. See Sections 1609 for wind design requirements and see Section 1613 for earthquake design requirements.~~

Reason: The requirement that anchors attaching concrete and masonry walls to supporting construction be designed for a lower bound value of 280 pounds per linear foot is excessive and discriminatory considering that anchorage of walls of other materials is required to be designed for a horizontal force of 5% of the weight of the wall tributary to the anchor by Section 11.7.3 of ASCE 7-05.

To illustrate the punitive nature of the provision, consider two 10-foot high walls that are representative of walls used in single family dwellings and small commercial buildings; one a 5.5-inch thick concrete wall, the other a light-framed wall with 4-inch thick nominal masonry veneer anchored to the wall framing. The weight of the light-framed wall, including veneer is estimated to be 45 psf; therefore, the weight tributary to an anchor at the top of the wall is 225 plf ($45 * (10/2) = 225$). The required design anchorage force for this wall is 11 plf ($225 * 0.05 = 11$). For the 5.5-inch concrete wall (weight 69 psf), the weight tributary to an anchor at the top of the wall is 345 plf ($69 * (10/2) = 345$). Based on the requirement that applies to walls of other than concrete or masonry, the required anchorage design force for the concrete wall should be 17 plf ($345 * 0.05 = 17$); however, 280 plf must be used to design the anchorage.

Let's examine how the 280 plf requirement compares to wind design. ASCE 7, Section 6.1.4.2 requires that components and cladding be designed for a minimum service level design wind pressure of 10 psf. For our example walls using this minimum design wind pressure, the strength level (factored) force at the top of the wall due to wind is 80 plf ($10 * (10/2) * 1.6 = 80$). Now let's determine what basic wind speed is required to result in a factored design force at the top of the wall of 280 plf (strength level). The service level (unfactored) force comparable to 280 plf is 175 plf ($280/1.6 = 175$). Since 175 plf is based on a tributary wall height of 5 feet, the design wind pressure is 35 psf ($175/5 = 35$). From ASCE 7, Figure 6-3, for a building in exposure B, height of 30 feet, K_{zt} of 1.0, and effective wind area of less than or equal to 10 square feet for wall area 4, the negative design pressure for a basic wind speed of 140 mph is 38.2 psf. Therefore, the requirement that the 5.5-inch, 10-foot high concrete wall be anchored against a force of 280 plf is the same as requiring that the connection be designed for a basic wind speed of approximately 135 mph in exposure B.

It is obvious that in a world that is rapidly embracing performance-based design, the requirement that anchorages for concrete and masonry walls be designed for a force of 280 plf is not necessary and discriminates against these products. In addition, by singling out walls of concrete and masonry, walls of other materials that could have comparable mass per unit area are exempt from the requirement. Based on the foregoing, the requirement that anchorages for concrete and masonry walls be designed for 280 plf should be deleted. In its place will be a reference to Section 11.7.3 of ASCE 7-05 which has attachments/anchorage requirements that apply to all buildings.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The minimum horizontal force of 280 pounds per foot that has been carried over from legacy codes is arbitrary and overly conservative.

Assembly Action:

None

Final Hearing Results

S57-07/08

AS

Code Change No: S58-07/08

Original Proposal

Section: 1604.8.3

Proponent: Edwin Huston, National Council of Structural Engineers Association (NCSEA), representing NCSEA Code Advisory Committee – General Engineering Subcommittee

Revise as follows:

1604.8.3 Decks. Where supported by attachment to an exterior wall, decks shall be positively anchored to the primary structure and designed for both vertical and lateral loads as applicable. Such attachment shall not be accomplished by the use of toenails or nails subject to withdrawal. Where positive connection to the primary building structure cannot be verified during inspection, decks shall be self-supporting. ~~For~~ In addition to the normal downward acting dead and live load reactions, decks with cantilevered framing members, connections to exterior walls or other framing members shall be designed and constructed to resist uplift resulting from the full live load specified in Table 1607.1 or snow load specified in Section 1608, whichever is greater, acting on the cantilevered portion of the deck, and no live load or snow load on the remaining portion of the span.

Reason: The existing last sentence is attempting to address the situation where the load on the cantilevered portion of the span may result in uplift at the support remote from the support at the cantilever. It is accepted engineering practice that for a cantilever, the full live load (or snow load) is placed on the cantilever, with no live or snow load on the remaining portion of the span. This may or may not cause uplift at the support, depending upon many factors. The proposal will clarify the intent and is consistent with the intent of Section 1607.10. Also, see Section 4.6 of ASCE 7-05. In addition, the proposal adds snow load since it is conceivable that snow load could control the design of the deck, especially where snow sliding or drifting from a higher roof must be considered.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Modified

Modify proposal as follows:

1604.8.3 Decks. Where supported by attachment to an exterior wall, decks shall be positively anchored to the primary structure and designed for both vertical and lateral loads as applicable. Such attachment shall not be accomplished by the use of toenails or nails subject to withdrawal. Where positive connection to the primary building structure cannot be verified during inspection, decks shall be self-supporting. In addition to the normal downward acting dead and live load reactions, ~~decks with cantilevered framing members,~~ connections to exterior walls or other framing members of decks with cantilevered framing members shall be designed and constructed to resist uplift resulting from the full live load specified in Table 1607.1 or snow load specified in Section 1608, whichever is greater, acting on the cantilevered portion of the deck, and no live load or snow load on the remaining portion of the ~~span~~ deck.

Committee Reason: This code change improves the code by clarifying the current required loading condition that affects the critical portion of the deck. The modification is editorial and further clarifies the intention of this code section.

Assembly Action:

None

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Edwin Huston, National Council of Structural Engineers Association (NCSEA), representing NCSEA Code Advisory Committee General Engineering Subcommittee, requests Approval as Modified by this Public Comment.

Further modify proposal as follows:

1604.8.3 Decks. Where supported by attachment to an exterior wall, decks shall be positively anchored to the primary structure and designed for both vertical and lateral loads as applicable. Such attachment shall not be accomplished by the use of toenails or nails subject to withdrawal. Where positive connection to the primary building structure cannot be verified during inspection, decks shall be self-supporting. ~~In addition to the normal downward acting dead and live load reactions, Connections of decks with cantilevered framing members connections to exterior walls or other framing members of decks with cantilevered framing members shall be designed and constructed to resist uplift resulting from the full live load specified in Table 1607.1 or snow load specified in Section 1608, whichever is greater, acting on the cantilevered portion of the deck, and no live load or snow load on the remaining portion of the deck for both of the following:~~

1. The reactions resulting from the dead, live load specified in Table 1607.1, or the snow load specified in Section 1608, in accordance with Section 1605, acting on all portions of the deck.
2. The reactions resulting from the dead load and live load specified in Table 1607.1 or the snow load specified in Section 1608, in accordance with Section 1605, acting on the cantilevered portion of the deck, and no live load or snow load on the remaining portion of the deck.

Commenter's Reason: NCSEA has received the suggested Public Comment from WTCA. They indicated another possible way this section could be interpreted. We agree that the above language is an editorial improvement to section 1604.8.3

Final Hearing Results

S58-07/08

AMPC

Code Change No: S60-07/08

Original Proposal

Sections: 1605.1, 1808.2.23.1.1, 1808.2.23.2.1, 1808.2.23.2.2, 1808.2.23.2.3, 1908.1.12

Proponent: Edwin T. Huston, Smith & Huston, Inc., representing the National Council of Structural Engineering Associations

Revise as follows:

1605.1 (Supp) General. Buildings and other structures and portions thereof shall be designed to resist:

1. The load combinations specified in Section 1605.2, 1605.3.1 or 1605.3.2,
2. The load combinations specified in Chapters 18 through 23, and
3. The load combinations with overstrength factor specified in Section 12.4.3.2 of ASCE 7 where required by Section 12.2.5.2, 12.3.3.3 or 12.10.2.1 of ASCE 7. With the simplified procedure of ASCE 7 Section 12.14, the load combinations with overstrength factor of Section 12.14.3.2 of ASCE 7 shall be used.

~~With the simplified procedure of ASCE 7 Section 12.14, the overstrength factor load combinations of Section 12.14.3.2 of ASCE 7 shall be used.~~ Applicable loads shall be considered, including both earthquake and wind, in accordance with the specified load combinations. Each load combination shall also be investigated with one or more of the variable loads set to zero.

The load combinations with overstrength factor in Section 12.4.3.2 of ASCE 7 shall be used in lieu of the following as follows:

1. The ~~load~~ Basic Combinations for Strength Design with Overstrength Factor in lieu of Equations 16-5 and 16-7 in Section 1605.2.1.
2. The ~~load~~ Basic Combinations for Allowable Stress Design with Overstrength Factor in lieu of Equations 16-12, 16-13 and 16-15 in Section 1605.3.1.
3. The ~~load~~ Basic Combinations for Allowable Stress Design with Overstrength Factor in lieu of Equations 16-20 and 16-21 in Section 1605.3.2.

1808.2.23.1.1 Connection to pile cap. Concrete piles and concrete-filled steel pipe piles shall be connected to the pile cap by embedding the pile reinforcement or field-placed dowels anchored in the concrete pile in the pile cap for a distance equal to the development length. For deformed bars, the development length is the full development

length for compression or tension, in the case of uplift, without reduction in length for excess area. Alternative measures for laterally confining concrete and maintaining toughness and ductile-like behavior at the top of the pile will be permitted provided the design is such that any hinging occurs in the confined region.

Ends of hoops, spirals and ties shall be terminated with seismic hooks, as defined in Section 21.1 of ACI 318, turned into the confined concrete core. The minimum transverse steel ratio for confinement shall not be less than one-half of that required for columns.

For resistance to uplift forces, anchorage of steel pipe (round HSS sections), concrete-filled steel pipe or H-piles to the pile cap shall be made by means other than concrete bond to the bare steel section.

Exception: Anchorage of concrete-filled steel pipe piles is permitted to be accomplished using deformed bars developed into the concrete portion of the pile.

Splices of pile segments shall develop the full strength of the pile, but the splice need not develop the nominal strength of the pile in tension, shear and bending when it has been designed to resist axial and shear forces and moments from the load combinations of ~~Section 1605.4~~ with overstrength factor in Section 12.4.3.2 of ASCE 7.

1808.2.23.2.1 (Supp) Design details for piers, piles and grade beams. Piers or piles on Site Class E or F sites, as determined in Section 1613.5.2, shall be designed and constructed to withstand maximum imposed curvatures from earthquake ground motions and structure response. Curvatures shall include free-field soil strains modified for soil-pile structure interaction coupled with pier or pile deformations induced by lateral pier or pile resistance to structure seismic forces.

Exception: Piers or piles that satisfy the following additional detailing requirements shall be deemed to comply with the curvature capacity requirements of this section.

1. Precast prestressed concrete piles detailed in accordance with Section 1809.2.3.2.2.
2. Cast-in-place concrete piles with a minimum longitudinal reinforcement ratio of 0.005 extending the full length of the pile and detailed in accordance with Sections 21.4.4.1, 21.4.4.2 and 21.4.4.3 of ACI 318 as required by this section.

Where constructed of nonprestressed concrete such piers or piles shall be designed and detailed in accordance with Sections 21.4.4.1, 21.4.4.2 and 21.4.4.3 of ACI 318 within seven pile diameters of the pile cap and within seven pile diameters of the interfaces of strata that are hard or stiff and strata that are liquefiable or are composed of soft to medium stiff clay.

Grade beams shall comply with the provisions in Section 21.10.3 of ACI 318 for grade beams, except where they have the capacity to resist the forces from the load combinations in ~~Section 1605.4.4~~ with overstrength factor in Section 12.4.3.2 of ASCE 7.

1808.2.23.2.2 Connection to pile cap. For piles required to resist uplift forces or provide rotational restraint, design of anchorage of piles into the pile cap shall be provided considering the combined effect of axial forces due to uplift and bending moments due to fixity to the pile cap. Anchorage shall develop a minimum of 25 percent of the strength of the pile in tension. Anchorage into the pile cap shall be capable of developing the following:

1. In the case of uplift, the lesser of the nominal tensile strength of the longitudinal reinforcement in a concrete pile, or the nominal tensile strength of a steel pile, or the pile uplift soil nominal strength factored by 1.3 or the axial tension force resulting from the load combinations of ~~Section 1605.4~~ with overstrength factor in Section 12.4.3.2 of ASCE 7.
2. In the case of rotational restraint, the lesser of the axial and shear forces, and moments resulting from the load combinations of ~~Section 1605.4~~ with overstrength factor in Section 12.4.3.2 of ASCE 7 or development of the full axial, bending and shear nominal strength of the pile.

1808.2.23.2.3 Flexural strength. Where the vertical lateral-force-resisting elements are columns, the grade beam or pile cap flexural strengths shall exceed the column flexural strength.

The connection between batter piles and grade beams or pile caps shall be designed to resist the nominal strength of the pile acting as a short column. Batter piles and their connection shall be capable of resisting forces and moments from the load combinations of ~~Section 1605.4~~ with overstrength factor in Section 12.4.3.2 of ASCE 7.

1908.1.12 ACI 318, Section 21.12.5. Modify ACI 318, Section 21.12.5, by adding new Section 21.12.5.6 to read as follows:

21.12.5.6 – Columns supporting reactions from discontinuous stiff members, such as walls, shall be designed for the special load combinations with overstrength factor in Section 12.4.3.2 of ASCE 7 in Section 1605.4 of the International Building Code and shall be provided with transverse reinforcement at the spacing, s_o , as defined in 21.12.5.2 over their full height beneath the level at which the discontinuity occurs. This transverse reinforcement shall be extended above and below the column as required in 21.4.4.5.

Reason: Code clarification.

Removes vestigial references to the now absent Section 1605.4. Removes the incorrect “in lieu of” that introduces a series of items containing “in lieu of”. Revises the terminology to be consistent with ASCE Section 12.14.3.2. In the second numbered list, revises the terminology for load combinations (including capitalization) to be perfectly consistent with the designations in Section 12.4.3.2 of ASCE 7.

For three reasons, moves the first sentence of the second paragraph so that it appears in item 3 of the numbered list. First, items 1 and 2 apply where the simplified procedure is used. Second, the first sentence of the second paragraph specifies how overstrength comes into play where the simplified procedure is used. Third, the last two sentences of the second paragraph are meant to apply in all cases, not just where the simplified procedure is used.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Modified

Modify proposal as follows:

1605.1 (Supp) General. Buildings and other structures and portions thereof shall be designed to resist:

1. The load combinations specified in Section 1605.2, 1605.3.1 or 1605.3.2,
2. The load combinations specified in Chapters 18 through 23, and
3. The load combinations with overstrength factor specified in Section 12.4.3.2 of ASCE 7 where required by Section 12.2.5.2, 12.3.3.3 or 12.10.2.1 of ASCE 7. With the simplified procedure of ASCE 7 Section 12.14, the load combinations with overstrength factor of Section 12.14.3.2 of ASCE 7 shall be used.

Applicable loads shall be considered, including both earthquake and wind, in accordance with the specified load combinations. Each load combination shall also be investigated with one or more of the variable loads set to zero.

Where the load combinations with overstrength factor in Section 12.4.3.2 of ASCE 7 apply, they shall be used as follows:

1. The Basic Combinations for Strength Design with Overstrength Factor in lieu of Equations 16-5 and 16-7 in Section 1605.2.1.
2. The Basic Combinations for Allowable Stress Design with Overstrength Factor in lieu of Equations 16-12, 16-13 and 16-15 in Section 1605.3.1.
3. The Basic Combinations for Allowable Stress Design with Overstrength Factor in lieu of Equations 16-20 and 16-21 in Section 1605.3.2.

(Portions of proposal not shown remain unchanged)

Committee Reason: The code change provides correlation with the ASCE 7 overstrength combinations. The modification clarifies when these load combinations are to be used.

Assembly Action:

None

Final Hearing Results

S60-07/08

AM

Code Change No: S61-07/08

Original Proposal

Section: 1605.1.1 (New)

Proponent: William Sherman, CH2M HILL, representing himself

Add new text as follows:

1605.1.1 Stability. Where overall structure stability (such as stability against overturning, sliding, or buoyancy) is checked using the load combinations in Section 1605.2, strength reduction factors applicable to soil resistance shall be provided by a qualified geotechnical engineer and consideration shall be given to acceptable behavior at service

loads. Where structural elements are designed for strength using the load combinations in 1605.2, it is permissible to check overall structure stability using the load combinations in 1605.3. Where the load combinations in 1605.3 are used to check overall structure stability, the dead load factor in each load combination shall be taken as 1.0 where the factors of safety in Section 1806.1 are applied.

Reason: Clarification of code provisions – existing code language implies that it applies to all design conditions but is not clear as to how load combinations are to be used when performing stability analysis of structures. Structure stability safety factors would be different using factored loads than using unfactored loads. Some factors applied to loads in the ASD provisions may duplicate the purpose of separately applied safety factors, such as the “safety factor of 1.5 against overturning or sliding” in Section 1806.1. If factored loads are used, soil resistance must consider strength reduction factors that are not provided by standard building codes.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Modified

Modify proposal as follows:

~~1605.1.1 Stability. Regardless of which load combinations are used to design for strength, where overall structure stability (such as stability against overturning, sliding, or buoyancy) is checked using being verified, use of the load combinations specified in Section 1605.2 or 1605.3 shall be permitted. Where the load combinations specified in Section 1605.2 are used, strength reduction factors applicable to soil resistance shall be provided by a registered design professional, qualified geotechnical engineer and consideration shall be given to acceptable behavior at service loads. Where structural elements are designed for strength using the load combinations in 1605.2, it is permissible to check overall structure stability using the load combinations in 1605.3. Where the load combinations in 1605.3 are used to check overall structure stability, the dead load factor in each load combination shall be taken as 1.0 where the factors of safety in Section 1806.1 are applied. The stability of retaining wall shall be verified in accordance with Section 1807.2.3.~~

Committee Reason: This proposal provides a clarification of the code with respect to stability. The modification improves the wording so that the intent is clearer and also coordinates with Chapter 18 requirements.

Assembly Action:

None

Final Hearing Results

S61-07/08

AM

Code Change No: S62-07/08

Original Proposal

Sections: 1602, 1605.2.2, 1605.3.1.2, 1612.4

Proponent: Rebecca C. Quinn, RC Quinn Consulting, Inc., representing U.S. Homeland Security, Federal Emergency Management Agency

Revise as follows:

**SECTION 1602
DEFINITIONS AND NOTATIONS**

F_a = Flood load in accordance with Chapter 5 of ASCE 7.

1605.2.2 Other Flood loads. Where flood loads F_a is are to be considered in the design, the load combinations of Section 2.3.3 of ASCE 7 shall be used.

1605.3.1.2 Other Flood loads. Where flood loads F_a is are to be considered in design, the load combinations of Section 2.4.2 of ASCE 7 shall be used.

1612.4 Design and construction. The design and construction of buildings and structures located in flood hazard areas, including flood hazard areas subject to high velocity wave action, shall be in accordance with Chapter 5 of ASCE 7 and with ASCE 24.

Reason: The purpose of the code changes in 1605 is to clarify use of the notation for flood loads. Section 1602 defines F_a to mean flood load (see under "Notations"). Sections 1605.2.2 and 1605.3.1.2 no longer contain provisions for loads other than flood loads, and IBC Section 1613 uses " F_a " to mean something other than flood loads. The proposed change makes it clear where F_a means flood loads.

The purpose of the code change in 1612 is to more clearly direct the user to Chapter 5 of ASCE 7, which is where flood loads are specified.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: This proposal clarifies the notation for flood loads and makes the appropriate reference to ASCE 7.

Assembly Action:

None

Final Hearing Results

S62-07/08

AS

Code Change No: S63-07/08

Original Proposal

Section: 1605.3.1

Proponent: W. Lee Shoemaker, Ph.D., PE, Thomas Associates, Inc., representing Metal Building Manufacturers Association

Revise as follows:

1605.3.1 Basic load combinations. Where allowable stress design (working stress design), as permitted by this code, is used, structures and portions thereof shall resist the most critical effects resulting from the following combinations of loads:

$D + F$	(Equation 16-8)
$D + H + F + L + T$	(Equation 16-9)
$D + H + F + (L_r \text{ or } S \text{ or } R)$	(Equation 16-10)
$D + H + F + 0.75(L + T) + 0.75 (L_r \text{ or } S \text{ or } R)$	(Equation 16-11)
$D + H + F + (W \text{ or } 0.7E)$	(Equation 16-12)
$D + H + F + 0.75 (W \text{ or } 0.7E) + 0.75L + 0.75 (L_r \text{ or } S \text{ or } R)$	(Equation 16-13)
$0.6D + W + H$	(Equation 16-14)
$0.6D + 0.7E + H$	(Equation 16-15)

Exceptions:

1. Crane hook loads need not be combined with roof live load or with more than three-fourths of the snow load or one-half of the wind load.
2. Flat roof snow loads of 30 psf (1.44 kN/m²) or less and roof live loads need not be combined with seismic loads. Where flat roof snow loads exceed 30 psf (1.44 kN/m²), 20 percent shall be combined with seismic loads.

Reason: Equation 16-13 of the allowable stress design basic load combinations is not consistent with the LRFD and alternate basic load combinations because roof live loads are not additive with earthquake loads in those combinations (Equation 16-5 and Equation 16-20, respectively). The reason that roof live load is not considered in conjunction with earthquake loads is that roof live loads are produced during maintenance and are of low probability of occurring simultaneously with earthquake loads. This proposed change makes all three load

combination sets correct and consistent. An alternate change was considered to revise the load combinations directly and not put this in the exception, but it would require splitting Equation 16-13 into two equations because the case with wind should include the roof live load. It was felt that the addition to the exception was the cleanest solution and not requiring an additional load combination.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Modified

Modify proposal as follows:

1605.3.1 Basic load combinations. Where allowable stress design (working stress design), as permitted by this code, is used, structures and portions thereof shall resist the most critical effects resulting from the following combinations of loads:

$D + F$	(Equation 16-8)
$D + H + F + L + T$	(Equation 16-9)
$D + H + F + (L_r \text{ or } S \text{ or } R)$	(Equation 16-10)
$D + H + F + 0.75(L + T) + 0.75(L_r \text{ or } S \text{ or } R)$	(Equation 16-11)
$D + H + F + (W \text{ or } 0.7E)$	(Equation 16-12)
$D + H + F + 0.75(W \text{ or } 0.7E) + 0.75L + 0.75(L_r \text{ or } S \text{ or } R)$	(Equation 16-13)
$0.6D + W + H$	(Equation 16-14)
$0.6D + 0.7E + H$	(Equation 16-15)

Exceptions:

1. Crane hook loads need not be combined with roof live load or with more than three-fourths of the snow load or one-half of the wind load.
2. Flat roof snow loads of 30 psf (1.44 kN/m²) or less and roof live loads of 30 psf or less need not be combined with seismic loads. Where flat roof snow loads exceed 30 psf (1.44 kN/m²), 20 percent shall be combined with seismic loads.

Add the following new item:

1605.3.2 Alternative basic load combinations. In lieu of the basic load combinations specified in Section 1605.3.1, structures and portions thereof shall be permitted to be designed for the most critical effects resulting from the following combinations. When using these alternative basic load combinations that include wind or seismic loads, allowable stresses are permitted to be increased or load combinations reduced where permitted by the material chapter of this code or the referenced standards. For load combinations that include the counteracting effects of dead and wind loads, only two-thirds of the minimum dead load likely to be in place during a design wind event shall be used. Where wind loads are calculated in accordance with Chapter 6 of ASCE 7, the coefficient ω in the following equations shall be taken as 1.3. For other wind loads, ω shall be taken as 1. When using these alternative load combinations to evaluate sliding, overturning and soil bearing at the soil-structure interface, the reduction of foundation overturning from Section 12.13.4 in ASCE 7 shall not be used. When using these alternative basic load combinations for proportioning foundations for loadings, which include seismic loads, the vertical seismic load effect, E_v , in Equation 12.4-4 of ASCE 7 is permitted to be taken equal to zero.

$D+ L + (L_r \text{ or } S \text{ or } R)$	(Equation 16-16)
$D+ L + (\omega W)$	(Equation 16-17)
$D+ L + \omega W + S/2$	(Equation 16-18)
$D+ L + S + \omega W/2$	(Equation 16-19)
$D+ L + S + E/1.4$	(Equation 16-20)
$0.9D + E/1.4$	(Equation 16-21)

Exceptions:

1. Crane hook loads need not be combined with roof live loads or with more than three-fourths of the snow load or one-half of the wind load.
2. Flat roof snow loads of 30 psf (1.44 kN/m²) or less and roof live loads of 30 psf or less need not be combined with seismic loads. Where flat roof snow loads exceed 30 psf (1.44 kN/m²), 20 percent shall be combined with seismic loads.

Committee Reason: This code changes brings consistency between strength load combinations and allowable stress load combinations. The modification limits applicability of the exception to roof live loads and also extends this allowance to the exception under the alternate basic allowable stress load combinations.

Assembly Action:

None

Final Hearing Results

S63-07/08

AM

Code Change No: **S66-07/08**

Original Proposal

Sections: 406.3.3, Table 1607.1, 1607.7, 1607.7.1, 1607.7.1.1, 1607.7.2, 1607.7.3

Proponent: Philip Brazil, PE, SE, Reid Middleton, Inc., representing himself

Revise as follows:

406.3.3 Construction. Open parking garages shall be of Type I, II or IV construction. Open parking garages shall meet the design requirements of Chapter 16. For vehicle barriers systems, see Section 406.2.4.

TABLE 1607.1 (Supp)
MINIMUM UNIFORMLY DISTRIBUTED LIVE LOADS AND MINIMUM CONCENTRATED LIVE LOADS⁹

OCCUPANCY OR USE	UNIFORM (psf)	CONCENTRATED (lbs.)
Vehicle barriers <u>systems</u>	See Section	1607.7.3

(Portions of table not shown remain unchanged)

1607.7 Loads on handrails, guards, grab bars, seats and vehicle barriers systems. Handrails, guards, grab bars as ~~designed in ICC A117.1~~, accessible seats, accessible benches and vehicle barriers systems shall be designed and constructed to the structural loading conditions set forth in this section.

1607.7.1 Handrails and guards. Handrails ~~assemblies~~ and guards shall be designed to resist a load of 50 plf (0.73 kN/m) applied in any direction at the top and to transfer this load through the supports to the structure. Glass handrail assemblies and guards shall also comply with Section 2407.

Exceptions:

1. For one- and two-family dwellings, only the single concentrated load required by Section 1607.7.1.1 shall be applied.
2. In Group I-3, F, H and S occupancies, for areas that are not accessible to the general public and that have an occupant load less than 50, the minimum load shall be 20 pounds per foot (0.29 kNm).

1607.7.1.1 Concentrated load. Handrails ~~assemblies~~ and guards shall be able to resist a single concentrated load of 200 pounds (0.89 kN), applied in any direction at any point along the top, and have attachment devices and supporting structure to transfer this loading to appropriate structural elements of the building. This load need not be assumed to act concurrently with the loads specified in the preceding paragraph.

1607.7.2 Grab bars, shower seats and dressing room bench seats benches. Grab bars ~~in accessible toilet and bathing facilities, shower seats in accessible bathtubs and shower compartments and dressing room bench seat systems~~ accessible benches in accordance with ICC A117.1 shall be designed to resist a single concentrated load of 250 pounds (1.11 kN) applied in any direction at any point.

1607.7.3 Vehicle barriers systems. Vehicle barrier systems for passenger cars shall be designed to resist a single load of 6,000 pounds (26.70 kN) applied horizontally in any direction to the barrier system and shall have anchorage or attachment capable of transmitting this load to the structure. For design of the system, the load shall be assumed to act at a minimum height of 1 foot, 6 inches (457 mm) above the floor or ramp surface on an area not to exceed 1 square foot (305 mm²), and is not required to be assumed to act concurrently with any handrail or guard loadings specified in the preceding paragraphs of Section 1607.7.1. Garages accommodating trucks and buses shall be designed in accordance with an approved method that contains provision for traffic railings.

Reason: The purpose for this proposal is to align the provisions of the IBC on the structural design requirements for handrails, guards, grab bars, accessible seats and vehicle barrier systems with the corresponding provisions in ICC A117.1 and ASCE 7-05, and to update the charging language associated with the provisions.

In Sections 1607.7, “vehicle barriers” is changed to “vehicle barrier systems” for consistency with Section 1607.7.3, the definition for “vehicle barrier system” in Section 1602.1 and Chapter 4 of ASCE 7-05. Similar changes are proposed in Section 406.3.3 and Table 1607.1.

“Accessible seats and accessible benches” are added to the charging language of Section 1607.7 in conjunction with their technical requirements in Section 1607.7.2. The reference to ICC A117.1 is relocated to Section 1607.7.2 where it is more appropriately specified.

In Sections 1607.7.1 and 1607.1.1, “handrail assemblies” is changed to “handrails” for consistency with IBC Sections 1009.10 and 1010.8 on stairway handrails and ramp handrails, respectively. In Section 1607.7.1, “glass handrail assemblies” is retained for consistency with Section 2407.

The revisions to Section 1607.7.2 are proposed to align the provisions of Section 1607 with the applicable provisions of ICC A117.1. The current provisions of ICC A117.1-03 applicable to IBC Section 1607 consist of: (1) Section 609 on grab bars in accessible toilet and bathing facilities, which specifies requirements for structural strength in Section 609.8; (2) Section 610 on seats in accessible bathtubs and shower compartments, which specifies requirements for structural strength in Section 610.4; (3) Section 803 on benches in accessible dressing, fitting and locker rooms, which references Section 903 for structural strength in Section 803.4; (4) Section 806.2 on benches in holding cells and housing cells, which references Section 903 for structural strength in Section 806.2.2; and (5) Section 903 on accessible benches, which references Section 903.6 for structural strength. The provisions of Sections 609.8, 610.4 and 903.6 on structural strength each require the referenced component, its fastener mounting device and its supporting structure be designed to resist the application of a vertical or horizontal force of 250 pounds at any point. As can be seen by these provisions, the applicable provisions of ICC A117.1 are not limited to grab bars, shower seats and dressing room bench seats. They are also not intended to be applicable to grab bars, seats or benches other than those required to be accessible by ICC A117.1.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Modified

Modify proposal as follows:

1607.7.1.1 Concentrated load. Handrails and guards shall be able to resist a single concentrated load of 200 pounds (0.89 kN), applied in any direction at any point along the top, and ~~have attachment devices and supporting structure to transfer this loading to appropriate structural elements of the building load through the supports to the structure.~~ This load need not be assumed to act concurrently with the loads specified in the preceding paragraph Section 1607.7.1.

1607.7.2 Grab bars, shower seats and dressing room bench seats benches. Grab bars in accessible toilet and bathing facilities, shower seats in accessible bathtubs and shower compartments and dressing room bench seat systems ~~accessible benches in accordance with ICC A117.1~~ shall be designed to resist a single concentrated load of 250 pounds (1.11 kN) applied in any direction at any point.

1607.7.3 Vehicle barriers systems. Vehicle barrier systems for passenger ~~cars~~ vehicles shall be designed to resist a single load of 6,000 pounds (26.70 kN) applied horizontally in any direction to the barrier system and shall have anchorage or attachment capable of transmitting this load to the structure. For design of the system, the load shall be assumed to act at a minimum height of 1 foot, 6 inches (457 mm) above the floor or ramp surface on an area not to exceed 1 square foot (305 mm²), and is not required to be assumed to act concurrently with any handrail or guard loadings specified in the preceding paragraphs of Section 1607.7.1. Garages accommodating trucks and buses shall be designed in accordance with an approved method that contains provision for traffic railings.

(Portions of proposal not shown remain unchanged)

Committee Reason: This is a clarification of the code, because it brings these revised sections into alignment with referenced standards. The modification also makes further improvements in the wording. The modification also retains the current wording of Section 1607.7.2 for grab bars because it was felt that grab bar design loads should apply to all grab bars regardless of the type of facility it is installed in.

Assembly Action:

None

Final Hearing Results

S66-07/08

AM

Code Change No: S68-07/08

Original Proposal

Table 1607.1

Proponent: Philip Brazil, PE, SE, Reid Middleton, Inc., representing himself

Revise table as follows:

**TABLE 1607.1 (Supp)
MINIMUM UNIFORMLY DISTRIBUTED LIVE LOADS AND MINIMUM CONCENTRATED LIVE LOADS⁹**

- a. Floors in garages or portions of buildings used for the storage of motor vehicles shall be designed for the uniformly distributed live loads of Table 1607.1 or the following concentrated loads: (1) for garages restricted to passenger vehicles accommodating not more than nine passengers, 3,000 pounds acting on an area of 4.5 inches by 4.5 inches; (2) for mechanical parking structures without slab or deck which are used for storing passenger vehicles only, 2,250 pounds per wheel.
- e. The concentrated wheel load shall be applied on an area of ~~20 square~~ 4.5 inches by 4.5 inches.

(Portions of table and footnotes not shown remain unchanged)

Reason: The revisions are proposed for consistency with the corresponding footnotes in Table 4-1 of ASCE 7-05. Compare Footnote (a) of Table 1607.1 with Footnote (a) of Table 4-1 and Footnote (e) of Table 1607.1 with Footnote (f) of Table 4-1.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The change to wheel load area is consistent with the same requirement in ASCE 7.

Assembly Action:

None

Final Hearing Results

S68-07/08

AS

Code Change No: **S70-07/08**

Original Proposal

Table 1607.1, Section: 1607.11.2.2

Proponent: Philip Brazil, PE, SE, Reid Middleton, Inc., representing himself

Revise table as follows:

TABLE 1607.1 (Supp)
MINIMUM UNIFORMLY DISTRIBUTED LIVE LOADS AND MINIMUM CONCENTRATED LIVE LOADS⁹

OCCUPANCY OR USE	UNIFORM (psf)	CONCENTRATED (lbs.)
30. Roofs		
All roof surfaces subject to maintenance workers		300
Awnings and canopies		
Fabric construction supported by a lightweight rigid skeleton structure	5	
All other construction	nonreduceable	
Ordinary flat, pitched, and curved roofs	20	
Primary roof members, exposed to a work floor	20	
Single panel point of lower chord of roof trusses or any point along primary structural members supporting roofs:		
Over manufacturing, storage warehouses, and repair garages		2,000
All other occupancies		300
Roofs used for other special purposes	Note I	Note I
Roofs used for promenade purposes	60	
Roofs used for roof gardens or assembly purposes	100	

(Portions of table and footnotes not shown remain unchanged)

1607.11.2.2 Special-purpose roofs. Roofs used for promenade purposes, roof gardens, assembly purposes or other special purposes shall be designed for a minimum live load as required in Table 1607.1. Such roof live loads are permitted to be reduced in accordance with 1607.9. Live loads of 100 psf (4.79 kN/m²) at areas of roofs classified as Group A occupancies shall not be reduced.

Reason: Section 1607.9.1.3 prohibits floor live loads of 100 psf or less in public assembly occupancies from being reduced. Section 1607.11.2.2 on special purpose roofs permits the live loads of roofs used for promenade purposes, roof gardens, assembly purposes or other special purposes to be reduced in accordance with the provisions of Section 1607.9 for floor live loads. Table 1607.1 lists a live load of 100 psf for roofs used for roof gardens or assembly purposes. This creates a potential conflict between Sections 1607.9.1.3 and 1607.11.2.2. The purpose for this proposal is to resolve the conflict by prohibiting live loads of 100 psf at areas of roofs classified as Group A occupancies from being reduced. Specifying roofs classified as Group A occupancies rather than roofs used for public assembly purposes avoids language that is vague and unenforceable in favor of a classification that is defined by the IBC (refer to Section 303). Roofs used for public assembly purposes can be interpreted as other than Group A occupancies but they would typically have an occupant load of less than 50 (i.e., Exception 1 to Section 303.1) and a prohibition on live load reduction is not judged to be warranted in such cases. Note that Section 303 classifies the use of a “building or structure, or a portion thereof, for the gathering of persons for purposes such as civic, social or religious functions recreation, food or drink consumption, or awaiting transportation, as a Group A occupancy.” Occupied roofs are not intended to be excluded from such a classification.

Item #30 of Table 1607.1 is changed for consistency with Table 4-1 of ASCE 7-05.

This proposal was prepared in conjunction with related proposals on reduction of floor live loads, reduction of roof live loads, and marquee live loads.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:**Approved as Modified****Modify proposal as follows:**

1607.11.2.2 Special-purpose roofs. Roofs used for promenade purposes, roof gardens, assembly purposes or other special purposes shall be designed for a minimum live load as required in Table 1607.1. Such roof live loads are permitted to be reduced in accordance with 1607.9. Live loads of 100 psf (4.79 kN/m²) or more at areas of roofs classified as Group A occupancies shall not be reduced.

(Portions of proposal not shown remain unchanged)

Committee Reason: This change clarifies the intent of the code's live load reduction for roofs with assembly occupancies. It is consistent with acceptance of code change S71-07/08. The modification covers areas where the live load happens to be greater than 100 psf.

Assembly Action:**None**

Final Hearing Results

S70-07/08

AM

Code Change No: S71-07/08

Original Proposal

Table 1607.1, Sections: 1607.9.1.4, 1607.11.1, 1607.11.2.1, 1607.11.2.2**Proponent:** Philip Brazil, PE, SE, Reid Middleton, Inc., representing himself**Revise as follows:**

TABLE 1607.1 (Supp)
MINIMUM UNIFORMLY DISTRIBUTED LIVE LOADS, L_o , AND MINIMUM CONCENTRATED LIVE LOADS⁹

(Portions of table and footnotes not shown remain unchanged)

1607.9.1.4 Special structural elements. Live loads shall not be reduced for one-way slabs except as permitted in Section 1607.9.1.1. ~~Live loads of 100 psf (4.79 kN/m²) or less shall not be reduced for roof members except as specified in Section 1607.11.2.~~

1607.11.1 Distribution of roof loads. Where uniform roof live loads are reduced to less than 20 psf (0.96 kN/m²) in accordance with Section 1607.11.2.1 and are ~~involved in~~ applied to the design of structural members arranged so as to create continuity, the ~~minimum applied loads~~ reduced roof live load shall be ~~the full dead loads on all spans in combination with the roof live loads on~~ applied to adjacent spans or ~~on~~ to alternate spans, whichever produces the greatest unfavorable effect. See Section 1607.11.2 for minimum roof live loads and Section 7.5 of ASCE 7 for partial snow loading.

1607.11.2.1 Flat, pitched and curved roofs. Ordinary flat, pitched and curved roofs are permitted to be designed for a reduced roof live load as specified in the following equations or other controlling combinations of loads in Section 1605, whichever produces the greater load. In structures such as greenhouses, where special scaffolding is used as a work surface for workers and materials during maintenance and repair operations, a lower roof load than specified in the following equations shall not be used unless approved by the building official. ~~Greenhouses~~ Such structures shall be designed for a minimum roof live load of 12 psf (0.58 kN/m²).

$$L_r = L_o R_1 R_2 \text{ (Equation 16-27)}$$

where: $12 \leq L_r \leq 20$ For SI: $L_r = L_o R_1 R_2$

where: $0.58 \leq L_r \leq 0.96$

L_r = Reduced live load per square foot (m^2) of horizontal projection in pounds per square foot (kN/m^2).

The reduction factors R_1 and R_2 shall be determined as follows:

R_1 = 1 for $A_t \leq 200$ square feet ($18.58 m^2$) (**Equation 16-28**)
 R_1 = $1.2 - 0.001 A_t$ for 200 square feet $< A_t < 600$ square feet (**Equation 16-29**)
 For SI: $1.2 - 0.011 A_t$ for 18.58 square meters $< A_t < 55.74$ square meters

R_1 = 0.6 for $A_t \geq 600$ square feet ($55.74 m^2$) (**Equation 16-30**)

where:

A_t = Tributary area (span length multiplied by effective width) in square feet (m^2) supported by any structural member, and

R_2 = 1 for $F \leq 4$ (**Equation 16-31**)
 R_2 = $1.2 - 0.05 F$ for $4 < F < 12$ (**Equation 16-32**)
 R_2 = 0.6 for $F \geq 12$ (**Equation 16-33**)

F = For a sloped roof, the number of inches of rise per foot (for SI: $F = 0.12 \times$ slope, with slope expressed as a percentage), or for an arch or dome, the rise-to-span ratio multiplied by 32.

1607.11.2.2 Special-purpose roofs. Roofs used for promenade purposes, roof gardens, assembly purposes or other special purposes shall be designed for a minimum live load, L_o , as ~~required~~ specified in Table 1607.1. Such roof live loads are permitted to be reduced in accordance with 1607.9.

Reason: The purpose of this proposal is to align IBC Section 1607.11 on roof live load reductions with similar provisions in Section 4.9 of ASCE 7-05 and to make related editorial revisions. Section 1607.11.1 on distribution of roof loads is revised for consistency with Footnote (h) of Table 4-1 in ASCE 7-05.

In Section 1607.11.2.1, "equation" is changed to "equations" in two places because the related provisions refer to Equations 16-27 through 16-33. A second paragraph is created to distinguish the general provisions from the specific provisions related to structures with special scaffolding. The reference to greenhouses is relocated for consistency with Section 4.9.1 of ASCE 7-05. Without this last revision, the last sentence of the section has no specific relationship to the second sentence, which is judged not to be the intent.

The notation, L_o , is added to Table 1607.1 for consistency with Table 4-1 of ASCE 7-05. Note that Sections 1607.9 and 1607.11 both reference minimum uniformly distributed live loads, L_o , in Table 1607.1, in the same manner as Sections 4.8 and 4.9, respectively, of ASCE 7-05. The notation is also added to Section 1607.11.2.2 on special purpose roofs. In the same section, "required" is changed to "specified" because tables don't require, they specify in conjunction with charging language that, in this case, is found in Section 1607.11.

In Section 1607.9.1.4, the second sentence on the limitations for the reduction of live loads is deleted for consistency with Section 4.9 of ASCE 7-05 and because it is judged to be archaic. The deletion eliminates a potential conflict with the charging language in Section 1607.9, which excludes roof live loads from the scope of Section 1607.9. The reduction of roof live loads is covered in Section 1607.11.2. Section 1607.9.1.4 prohibits reductions in roof live loads of 100 psf or less except as specified in Section 1607.11.2. It is silent, however, on reductions in roof live loads greater than 100 psf. Section 1607.11.2 is limited in scope to the roof live loads specified in Table 1607.1. All of the roof live loads listed in Table 1607.1 are 100 psf or less.

This proposal was prepared in conjunction with related proposals on reduction of floor live loads, live loads at marquees, and reduction of live loads at roofs used for assembly purposes.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Modified

Modify proposal as follows:

1607.11.1 Distribution of roof loads. Where uniform roof live loads are reduced to less than 20 psf ($0.96 kN/m^2$) in accordance with Section 1607.11.2.1 and are applied to the design of structural members arranged so as to create continuity, the reduced roof live load shall be applied to adjacent spans or to alternate spans, whichever produces the ~~greatest most~~ greatest unfavorable load effect. See Section 1607.11.2 for minimum roof live loads and Section 7.5 of ASCE 7 for partial snow loading.

(Portions of proposal not shown remain unchanged)

Committee Reason: This proposal eliminates conflicts in the live load provisions and harmonizes them with the ASCE 7 standard. The modification is editorial to further clarify the required loading on continuous roof members.

Assembly Action:

None

Final Hearing Results

S71-07/08

AM

Code Change No: **S74-07/08**

Original Proposal

Section: 1607.9

Proponent: Edwin Huston, National Council of Structural Engineers Association (NCSEA), representing National NCSEA Code Advisory Committee – General Engineering Subcommittee

Revise as follows:

1607.9 Reduction in live loads. Except for roof uniform live loads, all other minimum uniformly distributed live loads, L_o , in Table 1607.1 are permitted to be reduced in accordance with Section 1607.9.1 or 1607.9.2. Roof uniform live loads, other than special purpose roofs of Section 1607.11.2.2 are permitted to be reduced in accordance with Section 1607.11.2. Roof uniform live loads of special purpose roofs are permitted to be reduced in accordance with Section 1607.9.1 or 1607.9.2.

Reason: There is a conflict between sections 1607.9, which says that roof live loads can not be reduced using the method of 1607.9 and 1607.9.1.4, which says that roof live loads can be reduced. This proposal eliminates that conflict and points the user to the roof live load reduction section.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: This proposal resolves a conflict in the live load reduction provision, by clearly stating the intention of these provisions.

Assembly Action:

None

Final Hearing Results

S74-07/08

AS

Code Change No: **S75-07/08**

Original Proposal

Sections: 1607.9.1, Table 1607.9.1, 1607.9.1.1, 1607.9.1.2, 1607.9.1.3, 1607.9.1.4, 1607.9.1.5 (New)

Proponent: Philip Brazil, PE, SE, Reid Middleton, Inc., representing himself

Revise as follows:

1607.9.1 General. Subject to the limitations of Sections 1607.9.1.1 through 1607.9.1.4, members for which a value of $K_{LL}A_T$ is 400 square feet (37.16 m²) or more are permitted to be designed for a reduced live load in accordance with the following equation:

(No changes to equation 16-24)

where:

L = Reduced design live load per square foot (meter) of area supported by the member.

L_o = Unreduced design live load per square foot (meter) of area supported by the member (see Table 1607.1).

K_L = Live load element factor (see Table 1607.9.1).

A_T = Tributary area, in square feet (square meters).

~~L shall not be less than $0.50L_o$ for members supporting one floor and L shall not be less than $0.40L_o$ for members supporting two or more floors.~~

L shall not be less than $0.50 L_o$ for members supporting one floor and L shall not be less than $0.40 L_o$ for members supporting two or more floors.

**TABLE 1607.9.1
LIVE LOAD ELEMENT FACTOR, K_{LL}**

ELEMENT	K_{LL}
Interior columns	4
Exterior columns without cantilever slabs	4
Edge columns with cantilever slabs	3
Corner columns with cantilever slabs	2
Edge beams without cantilever slabs	2
Interior beams	2
All other members not identified above including: Edge beams with cantilever slabs Cantilever beams <u>One-way slabs</u> Two-way slabs Members without provisions for continuous shear transfer normal to their span	1

1607.9.1.4.1 1607.9.1.1 Special structural elements One-way slabs. ~~Live loads shall not be reduced for one-way slabs except as permitted in Section 1607.9.1.4. The tributary area, A_T , for one-way slabs shall not exceed an area defined by the slab span times a width normal to the span of 1.5 times the slab span. Live loads of 100 psf (4.79 kN/m²) or less shall not be reduced for roof members except as specified in Section 1607.11.2~~

1607.9.1.4.2 Heavy live loads. Live loads that exceed 100 psf (4.79 kN/m²) shall not be reduced.

Exceptions:

1. The live loads for members supporting two or more floors are permitted to be reduced by a maximum of 20 percent, but the live load shall not be less than L as calculated in Section 1607.9.1.
2. For uses other than storage, where approved, additional live load reductions shall be permitted where shown by the registered design professional that a rational approach has been used and that such reductions are warranted.

1607.9.1.2.3 Passenger vehicle garages. ~~The live loads shall not be reduced in passenger vehicle garages, except the live loads for members supporting two or more floors are permitted to be reduced by a maximum of 20 percent, but the live load shall not be less than L as calculated in Section 1607.9.1.~~

Exception: The live loads for members supporting two or more floors are permitted to be reduced by a maximum of 20 percent, but the live load shall not be less than L as calculated in Section 1607.9.1.

1607.9.1.3.4 Special-Group A occupancies. ~~Live loads of 100 psf (4.79 kN/m²) or less shall not be reduced in public assembly-Group A occupancies.~~

1607.9.1.5 Roofs members. Live loads of 100 psf (4.79 kN/m²) or less shall not be reduced for roof members except as specified in Section 1607.11.2.

Reason: The purpose of this proposal is to align IBC Section 1607.9.1 on the general method for floor live load reductions with similar provisions in Section 4.8 of ASCE 7-05 and to make related editorial revisions.

“One way slabs” is added to Table 1607.9.1 for consistency with Table 4-2 of ASCE 7.05. The second part of Section 1607.9.1.2 (Section 1607.9.1.3 in proposal) is reformatted into an exception for consistency with Section 4.8.3 of ASCE 7-05.

Section 1607.9.1.3 (Section 1607.9.1.4 in proposal) on public assembly occupancies is changed to Group A occupancies, thus, replacing language that is vague and unenforceable with a classification that is defined by the IBC (refer to Section 303). Public assembly occupancies could be interpreted as other than Group A occupancies but they would typically have an occupant load of less than 50 (i.e., Exception 1 to Section 303.1) and a prohibition on live load reduction is not judged to be warranted in such cases.

Also in Section 1607.9.1.3, “or less” is deleted, which reduces the scope of the section to live loads of 100 psf. Several items in Table 1607.1 list live loads for areas of public assembly that could be classified as a Group A occupancy, including Items #3 (armories and drill rooms), #4 (assembly areas and theaters), #6 (balconies), #8 (dance halls and ballrooms), #10 (dining rooms and restaurants), #19 (gymnasiums), #26 (lobbies of office buildings) and #28 (residential public rooms). A live load of at least 100 psf is specified for all but areas of fixed seats at Item #4. Prohibiting reductions in live loads at areas of fixed seats is not judged to be warranted. Live loads greater than 100 psf are currently covered by Section 1607.9.1.1 on heavy live loads.

Section 1607.9.1.4 is split into two parts. The first part on one-way slabs is relocated to a new Section 1607.9.1.1 and is changed from a general prohibition on live load reduction (except for heavy live loads) to a limit on the determination of tributary area, A_T , in the same manner as specified in Section 4.8.4 of ASCE 7-05. The relocation to Section 1607.9.1.1 is proposed because the subject matter of tributary area logically follows the calculation of reduced live load, which is based on tributary area. The sections that follow Section 1607.9.1.1 are largely prohibitions on live load reduction. The second part of Section 1607.9.1.4 is renumbered as Section 1607.9.1.5.

This proposal was prepared in conjunction with related proposals on reduction of roof live loads, live loads at marquees, and reduction of live loads at roofs used for assembly purposes.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Modified

Modify proposal as follows:

1607.9.1.4 Group A occupancies. Live loads of 100 psf (4.79 kN/m²) and at areas where fixed seats are located shall not be reduced in Group A occupancies.

(Portions of proposal not shown remain unchanged)

Committee Reason: This code change makes adjustments in the live load requirements that further align the IBC with the ASCE 7 live load provisions. The modification clarifies that the restriction on live load reductions in Group A occupancies also includes areas with fixed seating.

Assembly Action:

None

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because public comments were submitted.

Public Comment 1:

Edwin Huston, National Council of Structural Engineers Association (NCSEA), representing NCSEA Code Advisory Committee – General Engineering Subcommittee, requests Approval as Modified by this public comment.

Further modify proposal as follows:

1607.9.1.1 One-way slabs. The tributary area, A_T , for use in Equation 16-24 for one-way slabs shall not exceed an area defined by the slab span times a width normal to the span of 1.5 times the slab span.

(Portions of proposal not shown remain unchanged)

Commenter's Reason: There are two methods of live load reduction in the IBC, a Basic Method in Section 1607.9.1 which uses Equation 16-24 and an Alternate Method in Section 1607.9.2 which uses Equation 16-25. S75-07/08 defines A_T to agree with ASCE 7 to allow an area reduction for one-way slabs in the Basic Method. The Alternate Method does not have this definition. In the absence of guidance, NCSEA is concerned that Registered Design Professionals might misapply the definition of A_T in S75-07/08 for the Basic Method to the Alternate Method. In the Basic Method the maximum reduction occurs at a slab span of about 49 feet. If the definition of A_T in S75-07/08 for the Basic Method was applied to the Alternate Method the maximum reduction of 40% for the Alternate Method would occur at a slab span of less than 21 feet!! We consider this a possible life safety issue.

Given the potential life safety risks associated with this potential gap in the IBC, we urge you to approve this code change.

Public Comment 2:

Edwin Huston, National Council of Structural Engineers Association (NCSEA), representing NCSEA Code Advisory Committee, General Engineering Subcommittee requests Approval as Modified by this Public Comment.

Further modify proposal by adding new item as follows:

1607.9.2 Alternate floor live load reduction. As an alternative to Section 1607.9.1, floor live loads are permitted to be reduced in accordance with the following provisions. Such reductions shall apply to slab systems, beams, girders, columns, piers, walls and foundations.

1. A reduction shall not be permitted in Group A occupancies.
2. A reduction shall not be permitted where the live load exceeds 100 psf (4.79 kN/m²) except that the design live load for members supporting two or more floors is permitted to be reduced by 20 percent.
3. A reduction shall not be permitted in passenger vehicle parking garages except that the live loads for members supporting two or more floors are permitted to be reduced by a maximum of 20 percent.

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- 4. For live loads not exceeding 100 psf (4.79 kN/m²), the design live load for any structural member supporting 150 square feet (13.94 m²) or more is permitted to be reduced in accordance with the following equation:
- 5. For one-way slabs, the area, A, for use in Equation 16-25 shall not exceed the product of the slab span and a width normal to the span of 0.5 times the slab span.

R=0.08 (A-150) **(Equation 16-25)**

For SI: R = 0.861 (A -13.94)

Such reduction shall not exceed the smallest of:

- 1. 40 percent for horizontal members;
- 2. 60 percent for vertical members; or
- 3. R as determined by the following equation.

R= 23.1 (1 + D/Lo) **(Equation 16-26)**

where:

A = Area of floor supported by the member, square feet (m²).

D = Dead load per square foot (m²) of area supported.

Lo = Unreduced live load per square foot (m²) of area supported.

R = Reduction in percent.

Commenter's Reason: There are two methods of live load reduction in the IBC, a Basic Method in Section 1607.9.1 which uses Equation 16-24 and an Alternate Method in Section 1607.9.2 which uses Equation 16-25. S75-07/08 defines A_T to agree with ASCE 7 to allow an area reduction for one-way slabs in the Basic Method. The Alternate Method does not have this definition. In the absence of guidance, NCSEA is concerned that Registered Design Professionals might misapply the definition of A_T in S75-07/08 for the Basic Method to the Alternate Method. In the Basic Method the maximum reduction occurs at a slab span of about 49 feet. If the definition of A_T in S75-07/08 for the Basic Method was applied to the Alternate Method the maximum reduction of 40% for the Alternate Method would occur at a slab span of less than 21 feet!! We consider this a possible life safety issue. NCSEA submitted a Code Change Proposal on S77 which we are hereby modifying to address this issue.

NCSEA has looked at the relation ship between Equations 16-24 and 16-25 and finds that the best agreement between the two methods of live load reduction would be to use a definition of A in Equation 16-25 of the slab span times a width normal to the span of 0.5 times the slab span. A comparison table is shown below.

Summary % LL Reduction					
Span	Eq 16-24	Eq 16-25			
		0.5 span	.75 span	Span	1.5 Span
20	14	4	12	20	36
25	26	13	26	38	40 max
30	34	24	40 max	40 max	40 max
40	44	40 max	40 max	40 max	40 max
49	50 max	40 max	40 max	40 max	40 max

Given the potential life safety risks associated with this potential gap in the IBC, we urge you to approve this code change.

Final Hearing Results

S75-07/08

AMPC1, 2

Code Change No: S76-07/08

Original Proposal

Sections: 1607.9, 1607.11.1, 1607.11.2

Proponent: Philip Brazil, PE, SE, Reid Middleton, Inc., representing himself

Revise as follows:

1607.9 Reduction in live loads. Except for ~~roof~~ uniform live loads at roofs and marquees, all other minimum uniformly distributed live loads, L_o, in Table 1607.1 are permitted to be reduced in accordance with Section 1607.9.1 or 1607.9.2.

1607.11.1 Distribution of roof loads. Where uniform roof live loads are reduced to less than 20 psf (0.96 kN/m²) in accordance with Section 1607.11.2.1 and are involved in the design of structural members arranged so as to create continuity, the minimum applied loads shall be the full dead loads on all spans in combination with the roof live loads on adjacent spans or on alternate spans, whichever produces the greatest effect. See Section 1607.11.2 for reductions in minimum roof live loads and Section 7.5 of ASCE 7 for partial snow loading.

1607.11.2 (Supp) Reduction in roof live loads. The minimum uniformly distributed ~~roof~~ live loads of roofs and marquees, L_o , in Table 1607.1 are permitted to be reduced in accordance with Section 1607.11.2.1 or 1607.11.2.2.

1607.11.2.1 Flat, pitched and curved roofs. Ordinary flat, pitched and curved roofs, and awnings and canopies other than of fabric construction supported by lightweight rigid skeleton structures, are permitted to be designed for a reduced roof live load as specified in the following equation or other controlling combinations of loads in Section 1605, whichever produces the greater load. In structures where special scaffolding is used as a work surface for workers and materials during maintenance and repair operations, a lower roof load than specified in the following equation shall not be used unless approved by the building official. Greenhouses shall be designed for a minimum roof live load of 12 psf (0.58 kN/m²).

(No changes to equations or to their notation)

1607.11.2.2 Special-purpose roofs. Roofs used for promenade purposes, roof gardens, assembly purposes or other special purposes, and marquees, shall be designed for a minimum live load as required in Table 1607.1. Such ~~roof~~ live loads are permitted to be reduced in accordance with 1607.9.

Reason: Section 1607.9 on reductions in live loads applies to all uniformly distributed live loads specified in Table 1607.1 except for roof uniform live loads. Item #30 of Table 1607.1 specifies uniformly distributed live loads for roofs but Item #24 specifies the same for marquees. Section 1607.11 on roof loads includes marquees in its charging language but the technical provisions in the remainder of the section are silent on marquees. The purpose of this proposal is to revise the charging language in Sections 1607.9 and 1607.11 to comprehensively account for marquees. Note that Section 1607.11.2.1 is limited in scope to a reduction in roof live load based on the slope of the roof. Section 1607.11.2.2 is limited in scope to specific types of special purpose roofs, each one of which is also specified in Item #30 of Table 1607.1. The proposal adds marquees to Section 1607.11.2.2.

The proposal also corrects an inadvertent omission of awnings and canopies other than of fabric construction supported by a lightweight rigid skeleton structure from qualifying for a reduction in roof live load due to roof slope. Section 1607.11.2.1 is limited in scope to ordinary flat, pitched and curved roofs, which are one of the listings in Item #30 of Table 1607.1 for roofs. The presence of this listing effectively eliminates awnings and canopies from qualifying for a reduction in roof live due to roof slope because their listing in Item #30 is separate and distinct from flat, pitched and curved roofs. The proposal corrects this oversight. This came about when the addition of Item #30 to Table 1607.1 was approved by Proposal S20-04/05-AM. Before that, Item #29 in Table 1607.1 of the 2003 IBC for roofs referenced Section 1607.11, which specified provisions for reductions of roof live loads at ordinary flat, pitched and curved roofs in Section 1607.11.2.1.

This proposal was prepared in conjunction with related proposals on reduction of floor live loads, reduction of roof live loads, and reduction of live loads at roofs used for assembly purposes.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Modified

Modify proposal as follows:

1607.9 Reduction in live loads. Except for uniform live loads at roofs ~~and marquees~~, all other minimum uniformly distributed live loads, L_o , in Table 1607.1 are permitted to be reduced in accordance with Section 1607.9.1 or 1607.9.2.

(Portions of proposal not shown remain unchanged)

Committee Reason: This proposal makes the roof live load requirements clearer. The modification removes marquees from Section 1607.9 to eliminate any confusion between that provisions and Section 1607.11.2.2.

Assembly Action:

None

Final Hearing Results

S76-07/08

AM

Code Change No: S77-07/08

Original Proposal

Section: 1607.9.2

Proponent: Edwin Huston, National Council of Structural Engineers Association (NCSEA), representing National NCSEA Code Advisory Committee – General Engineering Subcommittee

Revise as follows:

1607.9.2 Alternate floor live load reduction. As an alternative to Section 1607.9.1, floor live loads are permitted to be reduced in accordance with the following provisions. Such reductions shall apply to slab systems, beams, girders, columns, piers, walls and foundations.

1. A reduction shall not be permitted in Group A occupancies.
2. A reduction shall not be permitted where the live load exceeds 100 psf (4.79 kN/m²) except that the design live load for members supporting two or more floors is permitted to be reduced by 20 percent.

Exception: For uses other than storage, where approved, additional live load reductions shall be permitted where shown by the registered design professional that a rational approach has been used and that such reductions are warranted.

3. A reduction shall not be permitted in passenger vehicle parking garages except that the live loads for members supporting two or more floors are permitted to be reduced by a maximum of 20 percent.
4. For live loads not exceeding 100 psf (4.79 kN/m²), the design live load for any structural member supporting 150 square feet (13.94 m²) or more is permitted to be reduced in accordance with the following equation:

Reason: This additional text will align the high live load reduction requirements when using Section 1607.9.2 "Alternate Floor Live Load Reduction" with text already in Section 1607.9.1.1 "Heavy Live Loads" when using the Basic Floor Live Load Reduction.

Cost Impact: The code change proposal will not increase the cost of construction (will possibly reduce construction cost in some instances).

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: This proposal makes the alternate live load reduction method more consistent with the basic method, by adding an exception which can allow the reduction of high live loads.

Assembly Action:

None

Final Hearing Results

S77-07/08

AS

Code Change No: **S79-07/08**

Original Proposal

Sections: 1609.1.1, 1609.1.1.1, 2308.2.1, Chapter 35; IRC R301.2.1.1, Chapter 43

Proponent: Med Kopczynski, City of Keene, NH, representing ICC IS-HRC Standards Committee

THESE PROPOSALS ARE ON THE AGENDA OF THE IBC STRUCTURAL AND THE IRC BUILDING/ENERGY CODE DEVELOPMENT COMMITTEES AS 2 SEPARATE CODE CHANGES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IBC STRUCTURAL

1. Revise as follows:

1609.1.1 (Supp) Determination of wind loads. Wind loads on every building or structure shall be determined in accordance with Chapter 6 of ASCE 7. The type of opening protection required, the basic wind speed and the exposure category for a site is permitted to be determined in accordance with Section 1609 or ASCE 7. Wind shall be assumed to come from any horizontal direction and wind pressures shall be assumed to act normal to the surface considered.

Exceptions:

1. Subject to the limitations of Section 1609.1.1.1, the provisions of ~~SBCCI SSTD-10~~ ICC-600 shall be permitted for applicable Group R-2 and R-3 buildings.
2. Subject to the limitations of Section 1609.1.1.1, residential structures using the provisions of the AF&PA WFCM.
3. Designs using NAAMM FP 1001.
4. Designs using TIA-222 for antenna-supporting structures and antennas.
5. Wind Tunnel tests in accordance with Section 6.6 of ASCE 7, subject to the limitations in Section 1609.1.1.2.

1609.1.1.1 Applicability. The provisions of ~~SSTD-10~~ ICC-600 are applicable only to buildings located within Exposure B or C as defined in Section 1609.4. The provisions of ~~SBCCI SSTD-10~~ ICC-600 and the AF&PA WFCM shall not apply to buildings sited on the upper half of an isolated hill, ridge or escarpment meeting the following conditions:

1. The hill, ridge or escarpment is 60 feet (18 288 mm) or higher if located in Exposure B or 30 feet (9144 mm) or higher if located in Exposure C;
2. The maximum average slope of the hill exceeds 10 percent; and
3. The hill, ridge or escarpment is unobstructed upwind by other such topographic features for a distance from the high point of 50 times the height of the hill or 1 mile (1.61 km), whichever is greater.

2308.2.1 Basic wind speed greater than 100 mph (3-second gust). Where the basic wind speed exceeds 100 mph (3-second gust), the provisions of either AF&PA WFCM, or the ~~SBCCI SSTD-10~~ ICC-600 are permitted to be used.

2. Revise standards as follows:

International Code Council (ICC)

~~SBCCI SSTD 10-99~~ — Standard for Hurricane Resistance Residential Construction
ICC-600 Standard for Residential Construction in High Wind Regions

PART II – IRC BUILDING/ENERGY

1. Revise as follows:

R301.2.1.1 (Supp) Design criteria. In regions where the basic wind speeds from Figure R301.2(4) equal or exceed 100 miles per hour (45 m/s) in hurricane-prone regions, or 110 miles per hour (49 m/s) elsewhere, the design of buildings shall be in accordance with one of the following methods. The elements of design not addressed by those documents in Items 1 through 4 shall be in accordance with this code.

1. American Forest and Paper Association (AF&PA) *Wood Frame Construction Manual for One- and Two-Family Dwellings* (WFCM); or
2. ~~Southern Building Code Congress International Standard for Hurricane Resistant Residential Construction (SSTD 10);~~ International Code Council (ICC) Standard for Residential Construction in High Wind Regions (ICC-600); or
3. *Minimum Design Loads for Buildings and Other Structures* (ASCE-7); or
4. American Iron and Steel Institute (AISI), *Standard for Cold-Formed Steel Framing—Prescriptive Method For One- and Two-Family Dwellings (COFS/PM) with Supplement to Standard for Cold-Formed Steel Framing—Prescriptive Method For One- and Two-Family Dwellings.*
5. Concrete construction shall be designed in accordance with the provisions of this code.
6. Structural insulated panels shall be designed in accordance with the provisions of this code.

2. Revise standards as follows:

International Code Council (ICC)

~~SBCCI SSTD 10-99 Standard for Hurricane Resistance Residential Construction~~
ICC-600 Standard for Residential Construction in High Wind Regions

Reason: This proposal is to delete the current ICC legacy Standard SSTD 10 – 99 and replace with the new ICC– 600 Standard for Residential Construction in High Wind Regions.

The ICC legacy standard SSTD 10 – 99 and its predecessors were the first US standards for high wind construction of residential structures. The SSTD 10 is based on the Standard Building Code wind loads and which used fastest-mile wind speeds. Although dated, the SSTD 10 is referenced by the IBC and IRC.

The new ICC– 600 standard provides a set of specifications that is consistent with the International Building Code and ASCE 7 wind loads, wind speed maps, and conventions. The primary focus of the update effort has been to provide a contemporary set of prescriptive requirements that supplement the International Residential Code provisions.

The ICC– 600 was developed by the ICC Consensus Committee on Hurricane Resistant Construction (IS-HRC) that operates under ANSI Approved ICC Consensus Procedures. A copy of a draft of the standard has been submitted to the ICC as allowed by ICC Council Policy; CP#28. ANSI certification of the standard is expected to be received prior to the ICC Final Action Hearings in September 2008.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

PART I – IBC STRUCTURAL

Committee Action:

Disapproved

Committee Reason: While the new reference standard will replace an outdated standard, it is not yet complete. It is hoped that a public comment can be submitted to allow this standard to be referenced by the code.

Assembly Action:

None

PART II – IRC B/E

Committee Action:

Approved as Submitted

Committee Reason: This new standard, ICC-600 Standard for Residential Construction in High Wind Regions, will be a great improvement over the legacy standard SSTD 10. The standard provides a set of specifications that is consistent with the IBC and ASCE 7 wind loads, wind speed maps, and conventions.

Assembly Action:

None

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because public comments were submitted.

*Public Comment 1:***Med Kopczynski, City of Keene, NH, representing ICC IS-HRC Standards Committee, requests Approval as Submitted.**

Commenter's Reason: This proposal is to delete the current ICC legacy Standard SSTD 10 – 99 and replace with the new ICC– 600 Standard for Residential Construction in High Wind Regions. The SSTD 10 is based on the Standard Building Code wind loads and which used fastest-mile wind speeds. The new ICC– 600 standard provides a set of specifications that is consistent with the International Building Code and ASCE 7 wind loads, wind speed maps, and conventions.

The IBC-Structural Committee disapproved this code change because the standard proposed for inclusion in the code, ICC 600, was not finalized. Since that time, the ICC/IS-HRC Standards Committee has completed its work, submitted the standard to ANSI for approval, received approval, and published the standard. Other than the objections stated regarding the completion of the standard, the committee had no other technical concerns or issues regarding this proposed code change. Given that the standard proposed for reference is now complete and in compliance with the ICC criteria for referenced standards given in ICC Council Policy no. CP 28, the ICC/IS- HRC Standards Committee request approval of the proposed code change S79-07/08 Part I "As Submitted."

*Public Comment 2:***Joseph J. Messersmith, Jr., P.E., Portland Cement Association, requests Approval as Submitted.**

Commenter's Reason: As indicated in the committee reason, the change to reference ICC-600 in the IBC was disapproved because the standard was not complete. It should be noted that Part II of this change to reference this new standard in the IRC was approved in Palm Springs. Since the Palm Springs hearings, the standard has been completed and the membership is urged to overturn the motion for disapproval and subsequently vote to approve Part I of the change.

Final Hearing Results

S79-07/08, Part I	AS
S79-07/08, Part II	AS

Code Change No: S80-07/08

Original Proposal

Sections: 1609.1.1, 1609.1.1.1

Proponent: Bonnie Manley, American Iron and Steel Institute, representing American Iron and Steel Institute

Revise as follows:

1609.1.1 (Supp) Determination of wind loads. Wind loads on every building or structure shall be determined in accordance with Chapter 6 of ASCE 7. The type of opening protection required, the basic wind speed and the exposure category for a site is permitted to be determined in accordance with Section 1609 or ASCE 7. Wind shall be assumed to come from any horizontal direction and wind pressures shall be assumed to act normal to the surface considered.

Exceptions:

1. Subject to the limitations of Section 1609.1.1.1, the provisions of SBCCI SSTD 10 shall be permitted for applicable Group R-2 and R-3 buildings.
2. Subject to the limitations of Section 1609.1.1.1, residential structures using the provisions of the AF&PA WFCM.
3. 3. 4. Subject to the limitations of Section 1609.1.1.1, residential structures using the provisions of AISI S230.
4. 5. Designs using NAAMM FP 1001.
5. 6. Designs using TIA-222 for antenna-supporting structures and antennas.
5. 6. Wind Tunnel tests in accordance with Section 6.6 of ASCE 7, subject to the limitations in Section 609.1.1.2.

1609.1.1.1 Applicability. The provisions of SSTD 10 are applicable only to buildings located within Exposure B or C as defined in Section 1609.4. The provisions of SBCCI SSTD 10, ~~and the AF&PA WFCM~~ and AISI S230 shall not apply to buildings sited on the upper half of an isolated hill, ridge or escarpment meeting the following conditions:

1. The hill, ridge or escarpment is 60 feet (18 288 mm) or higher if located in Exposure B or 30 feet (9144 mm) or higher if located in Exposure C;
2. The maximum average slope of the hill exceeds 10 percent; and
3. The hill, ridge or escarpment is unobstructed upwind by other such topographic features for a distance from the high point of 50 times the height of the hill or 1 mile (1.61 km), whichever is greater.

Reason: The 2006 IBC recognizes the use of the *AISI Standard for Cold-formed Steel Framing- Prescriptive Method for One- and Two-family Dwellings* in Section 2210.6. In fact, these prescriptive requirements form the basis for the cold-formed steel light frame construction provisions in the IRC. Additionally, the document, which addresses wind speeds up to 150 MPH, has been included by reference in the new ICC-600. Therefore, it is appropriate to further integrate this document as an acceptable method to address wind load requirements by recognizing its applicability and limitations in Section 1609.1.1. This code change references the new 2007 edition of AISI S230 standard, which is based on ASCE 7-05 wind provisions.

Throughout the IBC and IRC, code changes are being introduced to update the recognition of the AISI Prescriptive Method to the 2007 edition, which is identified by the AISI S230-07 designation. Details of the substantive changes between the 2004 AISI Supplement and A230-07 are contained in the supporting statement for AISI's code change proposal to update this reference in Section 2210.6.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The proposal adds an appropriate reference to the latest edition of the prescriptive cold-formed steel standard.

Assembly Action:

None

Final Hearing Results

S80-07/08

AS

Code Change No: S84-07/08

Original Proposal

Sections: 1609.1.1, 1609.6 (New)

Proponent: Edwin Huston, National Council of Structural Engineers Associations (NCSEA), representing NCSEA Code Advisory Committee – General Engineering Subcommittee

1. Revise as follows:

1609.1.1 (Supp) Determination of wind loads. Wind loads on every building or structure shall be determined in accordance with Chapter 6 of ASCE 7 or provisions of the Alternate All-heights Method in Section 1609.6. The type of opening protection required, the basic wind speed and the exposure category for a site is permitted to be determined in accordance with Section 1609 or ASCE 7. Wind shall be assumed to come from any horizontal direction and wind pressures shall be assumed to act normal to the surface considered.

Exceptions:

1. Subject to the limitations of Section 1609.1.1.1, the provisions of SBCCI SSTD 10 shall be permitted for applicable Group R-2 and R-3 buildings.
2. Subject to the limitations of Section 1609.1.1.1, residential structures using the provisions of the AF&PA WFCM.

3. Designs using NAAMM FP 1001.
4. Designs using TIA-222 for antenna-supporting structures and antennas.
5. Wind Tunnel tests in accordance with Section 6.6 of ASCE 7, subject to the limitations in Section 1609.1.1.2.

2. Add new text as follows:

1609.6 Alternate All-Heights method. The alternate wind design provisions in this section are simplifications of the ASCE 7 Method 2-Analytical Procedure.

1609.6.1 Scope. As an alternate to ASCE 7 Section 6.5, the following provisions are permitted to be used to determine the wind effects on regularly shaped buildings, or other structures which meet all of the following conditions:

1. The building or other structure is less than 100 feet (30480 mm) in height, with a height to least width ratio of 4 or less.
2. The building or other structure is not sensitive to dynamic effects.
3. The building or other structure is not located on a site for which channeling effects or buffeting in the wake of upwind obstructions warrant special consideration.

1609.6.1.1 Modifications. The following modifications shall be made to certain subsections in ASCE 7: Section 1609.6.3 Symbols and Notations that are specific to this section are used in conjunction with the Symbols and Notations in ASCE 7 Section.6.3.

1609.6.2 Symbols and notations. Coefficients and variables used in the Alternate All-Heights Method equations are as follows:

- C_{net} \equiv net-pressure coefficient based on $K_d [(G) (C_p) - (GC_{pi})]$. Ref Table 1609.6.2(2)
- G \equiv Gust effect factor equal to 0.85 for rigid structures per ASCE 7 Section 6.5.8.1.
- K_d \equiv Wind directionality factor per ASCE 7 Table 6-4.
- P_{net} \equiv Design wind pressure to be used in determination of wind loads on buildings or other structures or their components and cladding, in lb/ft² (N/m²).
- q_s \equiv Wind velocity pressure in lb/ft² (N/m²). (Per Table 1609.6.2(1))

1609.6.3 Design equations. When using the Alternate All-Heights Method, the Main-Wind-Force-Resisting System, (MWFRS) and Components and Cladding of every structure shall be designed to resist the effects of wind pressures on the building envelope in accordance with Equation (16-36).

$$P_{net} = q_s K_z C_{net} [I K_{zt}] \quad \text{(Equation 16-36)}$$

Design wind forces for the MWFRS shall not be less than 10 lb/ft² (0.48 KN/m²) multiplied by the area of the structure projected on a plane normal to the assumed wind direction. See ASCE Section 6.1.4 for criteria. Design net wind pressure for components and cladding shall not be less than 10 lb/ft² (0.48 KN/m²) acting in either direction normal to the surface.

1609.6.4 Design procedure. The MWFRS and the components and cladding of every building or other structure shall be designed for the pressures calculated using Equation (16-36).

1609.6.4.1 Main Wind-Force-Resisting Systems. The MWFRS shall be investigated for the torsional effects identified in ASCE 7 Figure 6-9.

1609.6.4.2 Determination of K_z and K_{zt} . Velocity Pressure Exposure Coefficient, K_z shall be determined in accordance with ASCE 7 Section 6.5.6.6 and the Topographic Factor, K_{zt} shall be determined in accordance with ASCE 7 Section 6.5.7.

1. For the windward side of a structure, K_{zt} and K_z shall be based on height z .
2. For leeward and side walls, and for windward and leeward roofs, K_{zt} and K_z shall be based on mean roof height h .

1609.6.4.3 Determination of net pressure coefficients, C_{net} . For the design of the Main Wind-Force-Resisting-System and for Components and Cladding, the sum of the internal and external net pressure shall be based on the net pressure coefficient C_{net} .

1. The pressure coefficient, C_{net} , for walls and roofs shall be determined from Table 1609.6.2(2).
2. Where C_{net} may have more than one value, the more severe wind load combination shall be used for design.

1609.6.4.4 Application of wind pressures. When using the Alternate All-Heights Method, wind pressures shall be applied simultaneously on, and in a direction normal to, all building envelope wall and roof surfaces.

1609.6.4.4.1 Components and cladding. Wind pressure for each component or cladding element is applied as follows using C_{net} values based on the effective wind area, A contained within the zones in areas-of-discontinuity of width and/or length “a”, “2a” or “4a” at: corners of roofs and walls; edge strips for ridges, rakes and eaves; or field areas on walls or roofs as indicated in Figures in Table 1609.6.2(2) in accordance with the following:

1. Calculated pressures at local discontinuities acting over specific edge strips or corner boundary areas.
2. Include “field” (zone 1, 2 or 4, as applicable) pressures applied to areas beyond the boundaries of the areas-of-discontinuity.
3. Where applicable, the calculated pressures at discontinuities (zones 2 or 3) shall be combined with design pressures that apply specifically on rakes or eave overhangs.

TABLE 1609.6.2(1)
WIND VELOCITY PRESSURE (q_s) AT STANDARD HEIGHT OF 33 FEET ^{a, b, c}

BASIC WIND SPEED, V (mph)	<u>85</u>	<u>90</u>	<u>100</u>	<u>105</u>	<u>110</u>	<u>120</u>	<u>125</u>	<u>130</u>	<u>140</u>	<u>150</u>	<u>160</u>	<u>170</u>
PRESSURE, q_s (psf)	18.5	20.7	25.6	28.2	31.0	36.9	40.0	43.3	50.2	57.6	65.5	74.0

- a. For Wind Speeds not shown, use $q_s = 0.00256 V^2$
- b. Multiply by 1.61 to convert to km/h
- c. Multiply by 0.048 to convert to kN/m²

TABLE 1609.6.2(2)
NET PRESSURE COEFFICIENTS, C_{net} ^{a, b, c}

STRUCTURE OR PART THEREOF	DESCRIPTION	C_{net} FACTOR		
		<u>Enclosed</u>	<u>Part Enclosed</u>	
1. Main Wind Force Resisting Frames and Systems	WALLS:			
	<u>Windward Wall</u>	<u>0.43</u>	<u>0.11</u>	
	<u>Leeward Wall</u>	<u>-0.53</u>	<u>-0.83</u>	
	<u>Side Wall</u>	<u>-0.66</u>	<u>-0.97</u>	
	<u>Parapet Wall</u>	<u>1.28</u>	<u>1.28</u>	
		<u>Leeward</u>	<u>-0.85</u>	<u>-0.85</u>
	ROOFS:			
	<u>Wind perpendicular to ridge</u>			
	<u>Leeward roof or flat roof</u>	<u>-0.66</u>	<u>-0.97</u>	
	<u>Windward roof slopes:</u>			
	<u>Slope < 2:12 (10°)</u>	<u>-1.09</u>	<u>-1.41</u>	
	<u>Slope = 4:12 (18°)</u>	<u>-0.73</u>	<u>-1.04</u>	
	<u>Slope = 5:12 (23°)</u>	<u>-0.58</u>	<u>-0.90</u>	
	<u>Slope = 6:12 (27°)</u>	<u>-0.47</u>	<u>-0.78</u>	
	<u>Case 2</u>	<u>0.20</u>	<u>0.51</u>	
<u>Slope = 7:12 (30°)</u>	<u>-0.37</u>	<u>-0.68</u>		

		Case 2	0.30	0.61	
	Slope 9:12 (37°)	Case 1	-0.27	-0.58	
		Case 2	0.31	0.63	
	Slope 12:12 (45°)		0.37	0.68	
	Wind parallel to ridge and flat roofs		-1.09	-1.41	
	Non Building Structures: Chimneys, Tanks and Similar Structures:				
		h/D			
		1	7	25	
	Square (Wind normal to face)	0.99	1.07	1.53	
	Square (Wind on diagonal)	0.77	0.84	1.15	
	Hexagonal or Octagonal	0.81	0.97	1.13	
	Round	0.65	0.81	0.97	
	Open Signs and Lattice Frameworks	Ratio of solid to gross area			
		< 0.1	0.1 to 0.29	0.3 to 0.7	
	Flat	1.45	1.30	1.16	
	Round	0.87	0.94	1.08	
2. Components and Cladding not in areas of discontinuity – Roofs and overhangs	Roof Elements and slopes	Enclosed		Partially Enc.	
	Gable or Hipped Configurations (Zone 1)				
	Flat < Slope < 6:12 (27°)				
	Positive	10 SF or less	0.58	0.89	
		100 SF or more	0.41	0.72	
	Negative	10 SF or less	-1.00	-1.32	
		100 SF or more	-0.92	-1.23	
	Overhang: Flat < Slope < 6:12 (27°)				
	Negative	10 SF or less	-1.45		
		100 SF or more	-1.36		
		500 SF or more	-0.94		
	6:12 (27°) < Slope < 12:12 (45°)				
	Positive	10 SF or less	0.92	1.23	
		100 SF or more	0.83	1.15	
	Negative	10 SF or less	-1.00	-1.32	
		100 SF or more	-0.83	-1.15	
	Monosloped Configurations (Zone 1)		Enclosed		Partially Enc.

	<u>Flat < Slope < 7:12 (30°)</u>			
	<u>Positive</u>	<u>10 SF or less</u>	<u>0.49</u>	<u>0.81</u>
		<u>100 SF or more</u>	<u>0.41</u>	<u>0.72</u>
	<u>Negative</u>	<u>10 SF or less</u>	<u>-1.26</u>	<u>-1.57</u>
		<u>100 SF or more</u>	<u>-1.09</u>	<u>-1.40</u>
	<u>Tall flat topped roofs h> 60'</u>		<u>Enclosed</u>	<u>Partially Enc.</u>
	<u>Flat < slope < 2:12 (10°) (Zone 1)</u>			
	<u>Negative</u>	<u>10 SF or less</u>	<u>-1.34</u>	<u>-1.66</u>
		<u>500 SF or more</u>	<u>-1.00</u>	<u>-1.32</u>
	<u>3. Components and Cladding in areas of discontinuities – Roofs and overhangs</u>	<u>Roof Elements and slopes</u>		<u>Enclosed</u>
<u>Gable or Hipped Configurations at Ridges, Eaves and Rakes (Zone 2)</u>				
<u>Flat < Slope < 6:12 (27°)</u>				
<u>Positive</u>		<u>10 SF or less</u>	<u>0.58</u>	<u>0.89</u>
		<u>100 SF or more</u>	<u>0.41</u>	<u>0.72</u>
<u>Negative</u>		<u>10 SF or less</u>	<u>-1.68</u>	<u>-2.00</u>
		<u>100 SF or more</u>	<u>-1.17</u>	<u>-1.49</u>
<u>Overhang for Slope Flat < Slope < 6:12 (27°)</u>				
<u>Negative</u>		<u>10 SF or less</u>	<u>-1.87</u>	
		<u>100 SF or more</u>	<u>-1.87</u>	
<u>6:12 (27°) < Slope < 12:12 (45°)</u>		<u>Enclosed</u>	<u>Partially Enc.</u>	
<u>Positive</u>		<u>10 SF or less</u>	<u>0.92</u>	<u>1.23</u>
		<u>100 SF or more</u>	<u>0.83</u>	<u>1.15</u>
<u>Negative</u>		<u>10 SF or less</u>	<u>-1.17</u>	<u>-1.49</u>
		<u>100 SF or more</u>	<u>-1.00</u>	<u>-1.32</u>
<u>Overhang for 6:12 (27°) < Slope < 12:12 (45°)</u>				
<u>Negative</u>		<u>10 SF or less</u>	<u>-1.70</u>	
		<u>100 SF or more</u>	<u>-1.53</u>	
<u>Monosloped Configurations at Ridges, Eaves and Rakes (Zone 2)</u>				

<u>Flat < Slope < 7:12 (30°)</u>			
<u>Positive</u>	<u>10 SF or less</u>	<u>0.49</u>	<u>0.81</u>
	<u>100 SF or more</u>	<u>0.41</u>	<u>0.72</u>
<u>Negative</u>	<u>10 SF or less</u>	<u>-1.51</u>	<u>-1.83</u>
	<u>100 SF or more</u>	<u>-1.43</u>	<u>-1.74</u>
<u>Tall flat topped roofs h> 60'</u>		<u>Enclosed</u>	<u>Partially Enc.</u>
<u>Flat < slope < 2:12 (10°) (Zone 2)</u>			
<u>Negative</u>	<u>10 SF or less</u>	<u>-2.11</u>	<u>-2.42</u>
	<u>500 SF or more</u>	<u>-1.51</u>	<u>-1.83</u>
<u>Gable or Hipped Configurations at Corners (Zone 3)</u>			
<u>Flat < Slope < 6:12 (27°)</u>		<u>Enclosed</u>	<u>Partially Enc.</u>
<u>Positive</u>	<u>10 SF or less</u>	<u>0.58</u>	<u>0.89</u>
	<u>100 SF or more</u>	<u>0.41</u>	<u>0.72</u>
<u>Negative</u>	<u>10 SF or less</u>	<u>-2.53</u>	<u>-2.85</u>
	<u>100 SF or more</u>	<u>-1.85</u>	<u>-2.17</u>
<u>Overhang for Slope Flat < Slope < 6:12 (27°)</u>			
<u>Negative</u>	<u>10 SF or less</u>	<u>-3.15</u>	
	<u>100 SF or more</u>	<u>-2.13</u>	
<u>6:12 (27°) < Slope < 12:12 (45°)</u>			
<u>Positive</u>	<u>10 SF or less</u>	<u>0.92</u>	<u>1.23</u>
	<u>100 SF or more</u>	<u>0.83</u>	<u>1.15</u>
<u>Negative</u>	<u>10 SF or less</u>	<u>-1.17</u>	<u>-1.49</u>
	<u>100 SF or more</u>	<u>-1.00</u>	<u>-1.32</u>
<u>Overhang for 6:12 (27°) < Slope <</u>		<u>Enclosed</u>	<u>Partially Enc.</u>
<u>Negative</u>	<u>10 SF or less</u>	<u>-1.70</u>	
	<u>100 SF or more</u>	<u>-1.53</u>	
<u>Monosloped Configurations at corners (Zone 3)</u>			
<u>Flat < Slope < 7:12 (30°)</u>			

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	<u>Positive</u>	<u>10 SF or less</u>	<u>0.49</u>	<u>0.81</u>
		<u>100 SF or more</u>	<u>0.41</u>	<u>0.72</u>
	<u>Negative</u>	<u>10 SF or less</u>	<u>-2.62</u>	<u>-2.93</u>
		<u>100 SF or more</u>	<u>-1.85</u>	<u>-2.17</u>
	<u>Tall flat topped roofs h > 60'</u>		<u>Enclosed</u>	<u>Partially Enc.</u>
	<u>Flat <slope < 2:12 (10°) (Zone 3)</u>			
	<u>Negative</u>	<u>10 SF or less</u>	<u>-2.87</u>	<u>-3.19</u>
		<u>500 SF or more</u>	<u>-2.11</u>	<u>-2.42</u>
<u>4. Components and Cladding not in areas of discontinuity - Walls and parapets</u>	<u>Wall Elements: h ≤ 60' (Zone 4)</u>		<u>Enclosed</u>	<u>Partially Enc.</u>
	<u>Positive</u>	<u>10 SF or less</u>	<u>1.00</u>	<u>1.32</u>
		<u>500 SF or more</u>	<u>0.75</u>	<u>1.06</u>
	<u>Negative</u>	<u>10 SF or less</u>	<u>-1.09</u>	<u>-1.40</u>
		<u>500 SF or more</u>	<u>-0.83</u>	<u>-1.15</u>
	<u>Wall Elements: h > 60' (Zone 4)</u>			
	<u>Positive</u>	<u>20 SF or less</u>	<u>0.92</u>	<u>1.23</u>
		<u>500 SF or more</u>	<u>0.66</u>	<u>0.98</u>
	<u>Negative</u>	<u>20 SF or less</u>	<u>-0.92</u>	<u>-1.23</u>
		<u>500 SF or more</u>	<u>-0.75</u>	<u>-1.06</u>
	<u>Parapet Walls</u>			
	<u>Positive</u>		<u>2.87</u>	<u>3.19</u>
<u>Negative</u>		<u>-1.68</u>	<u>-2.00</u>	
<u>5. Components and Cladding in areas of discontinuity - Walls and parapets</u>	<u>Wall Elements: h ≤ 60' (Zone 5)</u>		<u>Enclosed</u>	<u>Partially Enc.</u>
	<u>Positive</u>	<u>10 SF or less</u>	<u>1.00</u>	<u>1.32</u>
		<u>500 SF or more</u>	<u>0.75</u>	<u>1.06</u>
	<u>Negative</u>	<u>10 SF or less</u>	<u>-1.34</u>	<u>-1.66</u>
		<u>500 SF or more</u>	<u>-0.83</u>	<u>-1.05</u>
	<u>Wall Elements: h > 60' (Zone 5)</u>			
	<u>Positive</u>	<u>20 SF or less</u>	<u>0.92</u>	<u>1.23</u>
	<u>500 SF or more</u>	<u>0.66</u>	<u>0.98</u>	

	<u>Negative</u>	<u>20 SF or less</u>	<u>-1.68</u>	<u>-2.00</u>
		<u>500 SF or more</u>	<u>-1.00</u>	<u>-1.32</u>
	<u>Parapet Walls</u>			
	<u>Positive</u>		<u>3.64</u>	<u>3.95</u>
	<u>Negative</u>		<u>-2.45</u>	<u>-2.76</u>

- a. Linear interpolation between values in the table is acceptable.
- b. For open buildings, multispan gable roofs, stepped roofs, sawtooth roofs, domed roofs, solid free standing walls and solid signs apply ASCE 7.
- c. Some C_{net} values have been grouped together. Less conservative results may be obtained by applying ASCE 7.

Reason: The all heights wind provisions of ASCE 7 are time consuming and confusing. Many engineers make significant errors in their use of this method. There is a simplified method in ASCE 7, but it is limited in use. Member Organizations of NCSEA have brought forward an alternate method which is in full compliance with ASCE 7. This method is being considered by the ASCE 7 Wind Committee, but it won't be able to be placed in the standard until the 2012 IBC is adopted. To speed this transition, this method is proposed for the IBC first.

The derivation of this method from ASCE 7 Chapter 6 is as follows:

C_{net} values

$$q_z = 0.00256 K_z K_{zt} K_d V^2 I \quad \text{Eqn 6-15}$$

$$p = q G C_p - q_i (GC_{pi}) \quad \text{Eqn 6-17}$$

$$p = 0.00256 K_h K_{zt} K_d V^2 I G C_p - 0.00256 K_z K_{zt} K_d V^2 I (GC_{pi})$$

Rearranging terms:

$$p = (0.00256 V^2 K_h K_d G C_p - 0.00256 V^2 K_z K_d (GC_{pi})) K_{zt} I$$

Define: $q_z = 0.00256 V^2$

$$\text{so: } p = (q_s K_h K_d G C_p - q_s K_z K_d (GC_{pi})) K_{zt} I$$

$$\text{and: } p = q_s K_d (K_h G C_p - K_z (GC_{pi})) K_{zt} I$$

For leeward wall and roof elements

$$K_h = K_z$$

$$\text{so: } p = q_s K_z (K_d (G C_p - (GC_{pi}))) K_{zt} I$$

$$\text{Substitute } C_{net} = K_d (G C_p - (GC_{pi}))$$

$$\text{and we get: } p = q_s K_z C_{net} K_{zt} I$$

which is Eqn. 16-xx in the draft.

For windward roof elements

$K_h \approx K_z$ and the same relationship holds.

For buildings: $K_d = 0.85$

For rigid structures: $G = 0.85$

$$\text{so: } C_{net} = 0.85 (0.85 C_p - (GC_{pi}))$$

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Modified

Modify proposal as follows:

1609.6.1 Scope. As an alternate to ASCE 7 Section 6.5, the following provisions are permitted to be used to determine the wind effects on regularly shaped buildings, or other structures which meet all of the following conditions:

1. The building or other structure is less than or equal to 75 400 feet (30480 22 860 mm) in height, with a height to least width ratio of 4 or less, or the building or other structure has a fundamental frequency greater than or equal to 1 hertz.
2. The building or other structure is not sensitive to dynamic effects.
3. The building or other structure is not located on a site for which channeling effects or buffeting in the wake of upwind obstructions warrant special consideration.
4. The building shall meet the requirements of a simple diaphragm building as defined in ASCE 7 Section 6.2.

TABLE 1609.6.2(2)
NET PRESSURE COEFFICIENTS, $C_{net}^{a, b, c}$

STRUCTURE OR PART THEREOF	DESCRIPTION	C_{net} FACTOR		
		Enclosed	Part Enclosed	
1. Main Wind Force Resisting Frames and Systems	WALLS:	Enclosed	Part Enclosed	
	Windward Wall	0.43	0.11	
	Leeward Wall	-0.53 <u>-0.51</u>	-0.83	
	Side Wall	-0.66	-0.97	
	Parapet Wall	Windward	1.28	1.28
		Leeward	-0.85	-0.85
	ROOFS:	Enclosed	Part Enclosed	
	Wind perpendicular to ridge			
	Leeward roof or flat roof	-0.66	-0.97	
	Windward roof slopes:			
	Slope < 2:12 (10°)	Case 1	-1.09	-1.41
		Case 2	<u>-0.28</u>	<u>-0.60</u>
	Slope = 4:12 (18°)	Case 1	-0.73	-1.04
		Case 2	<u>-0.05</u>	<u>-0.37</u>
	Slope = 5:12 (23°)	Case 1	-0.58	-0.90
		Case 2	<u>0.03</u>	<u>-0.29</u>
	Slope = 6:12 (27°)	Case 1	-0.47	-0.78
		Case 2	0.20 <u>0.06</u>	0.54 <u>-0.25</u>
	Slope = 7:12 (30°)	Case 1	-0.37	-0.68
		Case 2	0.30 <u>0.07</u>	0.64 <u>-0.25</u>
	Slope 9:12 (37°)	Case 1	-0.27	-0.58
		Case 2	0.34 <u>0.14</u>	0.63 <u>-0.18</u>
	Slope 12:12 (45°)		0.37 <u>0.14</u>	0.68 <u>-0.18</u>
	Wind parallel to ridge and flat roofs	-1.09	-1.41	

(Portions of proposal not shown remain unchanged)

Committee Reason: This proposal provides a needed alternative that addresses concerns over the complexity of the ASCE 7 Method 2 wind analysis. Exam committees have considered this complexity to be the primary cause in the disparity in answers given to test questions on Method 2. Adding this now is similar to the approach taken when adding the simplified wind method to the SBC and the 2000 IBC, which prompted the ASCE 7 committee to get it into their document. With the floor modifications this proposal is superior to S85-07/08. The modification places additional limitations on buildings that can qualify for this method of analysis, by eliminating flexible buildings and requiring simple diaphragm building. These address some of the concerns that were raised in connection with S85-07/08.

There were still some concerns with assumptions regarding internal pressurization. The resulting values are not necessarily conservative for Components and Cladding as well as MWFRS for some nonsymmetrical configurations. The same comment concerning the use of ASCE 7 figures that is noted on S85-07/08 applies to this change as well. It would have been preferable to include necessary figures in this proposal. There is also a concern with diaphragms. The method should probably be limited to rigid diaphragms. It is possible that horizontal truss elements could be unconservatively designed on the windward side because of the preference given to maximum negative values in the selection of these coefficients. The same concern in hurricane prone regions discussed in S85-07/08 applies to this proposal as well. The scope of application is too broad. There are possible issues down the road if we've begun using these values and ASCE 7 introduces a version of this method which provides different values.

Assembly Action:

None

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because public comments were submitted.

Public Comment 1:

Edwin Huston, National Council of Structural Engineers Association (NCSEA), representing NCSEA Code Advisory Committee, requests Approval as Modified by this Public Comment.

Further modify proposal as follows:

TABLE 1609.6.2(2)
NET PRESSURE COEFFICIENTS, $C_{net}^{a,b,c}$

STRUCTURE OR PART THEREOF	DESCRIPTION	C_{net} FACTOR				
		Enclosed		Partially Enclosed		
1. Main Wind Force Resisting Frames and Systems	WALLS:	<u>+ Internal Pressure</u>	<u>- Internal Pressure</u>	<u>+ Internal Pressure</u>	<u>- Internal Pressure</u>	
	Windward Wall	0.43	<u>0.73</u>	0.11	<u>1.05</u>	
	Leeward Wall	-0.51	<u>-0.21</u>	-0.83	<u>0.11</u>	
	Side Wall	-0.66	<u>-0.35</u>	-0.97	<u>-0.04</u>	
	Parapet Wall	Windward	1.28		1.28	
		Leeward	-0.85		-0.85	
	ROOFS:		Enclosed		Partially Enclosed	
	Wind perpendicular to ridge		<u>+ Internal Pressure</u>	<u>- Internal Pressure</u>	<u>+ Internal Pressure</u>	<u>- Internal Pressure</u>
	Leeward roof or flat roof		-0.66	<u>-0.35</u>	-0.97	<u>-0.04</u>
	Windward roof slopes:					
	Slope < 2:12 (10°)	Case 1	-1.09	<u>-0.79</u>	-1.41	<u>-0.47</u>
		Case 2	-0.28	<u>0.02</u>	-0.60	<u>0.34</u>
	Slope = 4:12 (18°)	Case 1	-0.73	<u>-0.42</u>	-1.04	<u>-0.11</u>
		Case 2	-0.05	<u>0.25</u>	-0.37	<u>0.57</u>
	Slope = 5:12 (23°)	Case 1	-0.58	<u>-0.28</u>	-0.90	<u>0.04</u>
		Case 2	0.03	<u>0.34</u>	-0.29	<u>0.65</u>
	Slope = 6:12 (27°)	Case 1	-0.47	<u>-0.16</u>	-0.78	<u>0.15</u>
		Case 2	0.06	<u>0.37</u>	-0.25	<u>0.68</u>
	Slope = 7:12 (30°)	Case 1	-0.37	<u>-0.06</u>	-0.68	<u>0.25</u>
		Case 2	0.07	<u>0.37</u>	-0.25	<u>0.69</u>
	Slope 9:12 (37°)	Case 1	-0.27	<u>0.04</u>	-0.58	<u>0.35</u>
		Case 2	0.14	<u>0.44</u>	-0.18	<u>0.76</u>
	Slope 12:12 (45°)		0.14	<u>0.44</u>	-0.18	<u>0.76</u>
	Wind parallel to ridge and flat roofs		-1.09	<u>-0.79</u>	-1.41	<u>-0.47</u>

(Portions of table not shown remain unchanged)

- a) Linear interpolation between values in the table is acceptable.
b) For open buildings, multispan gable roofs, stepped roofs, sawtooth roofs, domed roofs, solid free standing walls and solid signs apply ASCE 7.
c) Some C_{net} values have been grouped together. Less conservative results may be obtained by applying ASCE 7.

(Portions of proposal not shown remain unchanged)

Commenter's Reason: At the Code Change Hearings in Palm Springs, Mr. Chock, who served on the ICC Structural Committee, expressed some concerns which are printed in the second paragraph of the Committee Reason Statement in the Report on the Hearings. NCSEA asked for more detailed information on these concerns and we were invited to attend an ASCE/SEI 7 Wind Load Subcommittee meeting which was held in San Francisco, CA on March 12. Subsequent to that meeting Mr. Chock forwarded a list of technical concerns from ASCE/SEI 7 to NCSEA.

On June 6, 2008 NCSEA again attended an ASCE/SEI 7 Wind Load Subcommittee meeting which was held at ASCE Headquarters in Reston, VA to present a response to those technical concerns. Based on the discussions from that meeting, NCSEA has drafted this Public Comment to address a substantial technical concern from ASCE/SEI 7. This Public comment adds another set of pressure coefficients to include the case of negative internal pressurization of the building for the Main-Wind-Force-Resisting System.

In the NCSEA reason statement included with S84, the following statement appears:

The all heights wind provisions of ASCE 7 are time consuming and confusing. Many engineers make significant errors in their use of this method. There is a simplified method in ASCE 7, but it is limited in use. Member Organizations of NCSEA have brought forward an alternate method which is in full compliance with ASCE 7. This method is being considered by the ASCE 7 Wind Committee, but it won't be able to be placed in the standard until the 2012 IBC is adopted. To speed this transition, this method is proposed for the IBC first.

At the time this Code Change Proposal was submitted that statement was correct. Since that time, ASCE/SEI 7 has begun consideration of a different format for wind simplification. If this proposal is adopted by the Wind Load Subcommittee and the main committee it would appear in the ASCE/SEI 7-10 Standard and could be considered for adoption into the 2012 IBC. In the meantime, modification of S84 will permit an alternative wind load methodology, which is in full compliance with the Method 2 procedure for all-heights, to be included in the 2009 IBC.

Public Comment 2:

James Riemenschneider, Structural Engineers Association of Oregon (SEAO)/Kramer Gehlen & Associates, representing, Structural Engineers Association of Oregon (SEAO), Wind Committee requests Approval as Modified by this Public Comment.

Further modify proposal as follows:

1609.6.4.4.1 Components and Cladding. Wind pressure for each component or cladding element is applied as follows using C_{net} values based on the effective wind area, A contained within the zones in areas-of-discontinuity of width and/or length “a”, “2a” or “4a” at: corners of roofs and walls; edge strips for ridges, rakes and eaves; or field areas on walls or roofs as indicated in Figures in the Tables in ASCE 7 as referenced in Table 1609.6.2(2) in accordance with the following:

1. Calculated pressures at local discontinuities acting over specific edge strips or corner boundary areas.
2. Include “field” (zone 1, 2 or 4, as applicable) pressures applied to areas beyond the boundaries of the areas-of-discontinuity.
3. Where applicable, the calculated pressures at discontinuities (zones 2 or 3) shall be combined with design pressures that apply specifically on rakes or eave overhangs.

TABLE 1609.6.2(2) – NET PRESSURE COEFFICIENTS, C_{NET} ^{a,b,c}

STRUCTURE OR PART THEREOF	DESCRIPTION	C_{net} FACTOR			
		Enclosed	Partially Enclosed		
1. Main Wind Force Resisting Frames and Systems	WALLS:	Enclosed	Partially Enclosed		
	Windward Wall	0.43	0.11		
	Leeward Wall	-0.51	-0.83		
	Side Wall	-0.66	-0.97		
	Parapet Wall	Windward	1.28	1.28	
		Leeward	-0.85	-0.85	
	ROOFS:	Enclosed	Partially Enclosed		
	Wind perpendicular to ridge				
	Leeward roof or flat roof	-0.66	-0.97		
	Windward roof slopes:				
	Slope < 2:12 (10°)	Case 1	-1.09	-1.41	
		Case 2	-0.28	-0.60	
	Slope = 4:12 (18°)	Case 1	-0.73	-1.04	
		Case 2	-0.05	-0.37	
	Slope = 5:12 (23°)	Case 1	-0.58	-0.90	
		Case 2	0.03	-0.29	
	Slope = 6:12 (27°)	Case 1	-0.47	-0.78	
		Case 2	0.06	-0.25	
	Slope = 7:12 (30°)	Case 1	-0.37	-0.68	
		Case 2	0.07	-0.25	
	Slope 9:12 (37°)	Case 1	-0.27	-0.58	
		Case 2	0.14	-0.18	
	Slope 12:12 (45°)		0.14	-0.18	
	Wind parallel to ridge and flat roofs	-1.09	-1.41		
	Non Building Structures: Chimneys, Tanks and Similar Structures:				
			h/D		
			1	7	25
	Square (Wind normal to face)		0.99	1.07	1.53
	Square (Wind on diagonal)		0.77	0.84	1.15
	Hexagonal or Octagonal		0.81	0.97	1.13
	Round		0.65	0.81	0.97

	Open Signs and Lattice Frameworks		Ratio of solid to gross area			
			< 0.1	0.1 to 0.29	0.3 to 0.7	
	Flat		1.45	1.30	1.16	
	Round		0.87	0.94	1.08	
1. Components and cladding not in areas of discontinuity – Roofs and overhangs	Roof Elements and slopes		Enclosed		Partially Enclosed	
	Gable or Hipped Configurations (Zone 1)					
	Flat < Slope < 6:12 (27°) <u>See ASCE 7 Figure 6-11C Zone 1</u>					
	Positive		10 SF or less	0.58	0.89	
			100 SF or more	0.41	0.72	
	Negative		10 SF or less	-1.00	-1.32	
			100 SF or more	-0.92	-1.23	
	Overhang: Flat < Slope < 6:12 (27°) <u>See ASCE 7 Figure 6-11B Zone 1</u>					
	Negative		10 SF or less	-1.45		
			100 SF or more	-1.36		
			500 SF or more	-0.94		
	6:12 (27°) < Slope < 12:12 (45°) <u>See ASCE 7 Figure 6-11D Zone 1</u>					
	Positive		10 SF or less	0.92	1.23	
			100 SF or more	0.83	1.15	
	Negative		10 SF or less	-1.00	-1.32	
			100 SF or more	-0.83	-1.15	
	Monosloped Configurations (Zone 1)		Enclosed		Partially Enclosed	
	Flat < Slope < 7:12 (30°) <u>See ASCE 7 Figure 6-14B Zone 1</u>					
	Positive		10 SF or less	0.49	0.81	
			100 SF or more	0.41	0.72	
	Negative		10 SF or less	-1.26	-1.57	
		100 SF or more	-1.09	-1.40		
Tall flat topped roofs h> 60'		Enclosed		Partially Enclosed.		

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	Flat < slope < 2:12 (10°) (Zone 1) <u>See ASCE 7 Figure 6-17 Zone 1</u>			
	Negative	10 SF or less	-1.34	-1.66
		500 SF or more	<u>-0.92</u>	<u>-1.23</u>
2. Components and cladding in areas of discontinuities – Roofs and overhangs	Roof Elements and slopes		Enclosed	Partially Enclosed.
	Gable or Hipped Configurations at Ridges, Eaves and Rakes (Zone 2)			
	Flat < Slope < 6:12 (27°) <u>See ASCE 7 Figure 6-11C Zone 2</u>			
	Positive	10 SF or less	0.58	0.89
		100 SF or more	0.41	0.72
	Negative	10 SF or less	-1.68	-2.00
		100 SF or more	-1.17	-1.49
	Overhang for Slope Flat < Slope < 6:12 (27°) <u>See ASCE 7 Figure 6-11C Zone 2</u>			
	Negative	10 SF or less	-1.87	
		100 SF or more	-1.87	
	6:12 (27°) < Slope < 12:12 (45°) <u>Table 6-11D</u>		Enclosed	Partially Enclosed
	Positive	10 SF or less	0.92	1.23
		100 SF or more	0.83	1.15
	Negative	10 SF or less	-1.17	-1.49
		100 SF or more	-1.00	-1.32
	Overhang for 6:12 (27°) < Slope < 12:12 (45°) <u>See ASCE 7 Figure 6-11D Zone 2</u>			
	Negative	10 SF or less	-1.70	
		100 SF or more	-1.53	
	Monosloped Configurations at Ridges, Eaves and Rakes (Zone 2)			
	Flat < Slope < 7:12 (30°) <u>See ASCE 7 Figure 6-14B Zone 2</u>			
	Positive	10 SF or less	0.49	0.81
		100 SF or more	0.41	0.72
	Negative	10 SF or less	-1.51	-1.83
		100 SF or more	-1.43	-1.74
	Tall flat topped roofs h > 60'		Enclosed	Partially Enclosed

Flat < slope < 2:12 (10°) (Zone 2) <u>See ASCE 7 Figure 6-17 Zone 2</u>			
Negative	10 SF or less	-2.11	-2.42
	500 SF or more	-1.51	-1.83
Gable or Hipped Configurations at Corners (Zone 3) <u>See ASCE 7 Figure 6-11C Zone 3</u>			
Flat < Slope < 6:12 (27°)		Enclosed	Partially Enclosed
Positive	10 SF or less	0.58	0.89
	100 SF or more	0.41	0.72
Negative	10 SF or less	-2.53	-2.85
	100 SF or more	-1.85	-2.17
Overhang for Slope Flat < Slope < 6:12 (27°) <u>See ASCE 7 Figure 6-11C Zone 3</u>			
Negative	10 SF or less	-3.15	
	100 SF or more	-2.13	
6:12 (27°) < Slope < 12:12 (45°) <u>See ASCE 7 Figure 6-11D Zone 3</u>			
Positive	10 SF or less	0.92	1.23
	100 SF or more	0.83	1.15
Negative	10 SF or less	-1.17	-1.49
	100 SF or more	-1.00	-1.32
Overhang for 6:12 (27°) < Slope < 12:12 (45°)		Enclosed	Partially Enclosed.
Negative	10 SF or less	-1.70	
	100 SF or more	-1.53	
Monosloped Configurations at corners (Zone 3) <u>See ASCE 7 Figure 6-14B Zone 3</u>			
Flat < Slope < 7:12 (30°)			
Positive	10 SF or less	0.49	0.81
	100 SF or more	0.41	0.72
Negative	10 SF or less	-2.62	-2.93
	100 SF or more	-1.85	-2.17
Tall flat topped roofs h> 60'		Enclosed	Partially Enclosed

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	Flat <slope < 2:12 (10°) (Zone 3) <u>See ASCE 7 Figure 6-17 Zone 3</u>			
	Negative	10 SF or less	-2.87	-3.19
		500 SF or more	-2.11	-2.42
3. Components and Cladding not in areas of discontinuity - Walls and parapets	Wall Elements: h ≤ 60' (Zone 4) <u>Table 6-11A</u>		Enclosed	Partially Enclosed
	Positive	10 SF or less	1.00	1.32
		500 SF or more	0.75	1.06
	Negative	10 SF or less	-1.09	-1.40
		500 SF or more	-0.83	-1.15
	Wall Elements: h > 60' (Zone 4) <u>See ASCE 7 Figure 6-17 Zone 4</u>			
	Positive	20 SF or less	0.92	1.23
		500 SF or more	0.66	0.98
	Negative	20 SF or less	-0.92	-1.23
		500 SF or more	-0.75	-1.06
	Parapet Walls			
	Positive		2.87	3.19
	Negative		-1.68	-2.00
	4. Components and Cladding in areas of discontinuity - Walls and parapets	Wall Elements: h ≤ 60' (Zone 5) <u>Table 6-11A</u>		Enclosed
Positive		10 SF or less	1.00	1.32
		500 SF or more	0.75	1.06
Negative		10 SF or less	-1.34	-1.66
		500 SF or more	-0.83	-1.05
Wall Elements: h > 60' (Zone 5) <u>See ASCE 7 Figure 6-17 Zone 4</u>				
Positive		20 SF or less	0.92	1.23
		500 SF or more	0.66	0.98
Negative		20 SF or less	-1.68	-2.00
		500 SF or more	-1.00	-1.32
Parapet Walls				
Positive			3.64	3.95
Negative			-2.45	-2.76

a. Linear interpolation between values in the table is acceptable.

b. For open buildings, multispans gable roofs, stepped roofs, sawtooth roofs, domed roofs, solid free standing walls and solid signs apply ASCE 7.

c. Some C_{net} values have been grouped together. Less conservative results may be obtained by applying ASCE 7.

(Portions of proposal not shown remain unchanged)

Commenter's Reason: The S84-07/08 code change proposal stated incorrectly that the zones and thus the definitions of the "a", "2a", or "4"a distance over which they apply were in Table 1609.6.2(2). They are not. This Public comment corrects the text in Section 1609.6.4.4.1 and adds the appropriate references to the Figures in ASCE 7 in Table 1609.6.2(2).

Public Comment 3:

Don Scott, Structural Engineers of Washington (SEAW), representing SEAW Wind Engineering Committee, requests Approval as Modified by this Public Comment.

Further modify proposal as follows:

1609.6.1 Scope: As an alternate to ASCE 7 Section 6.5, the following provisions are permitted to be used to determine the wind effects on regularly shaped buildings, or regularly shaped other structures which meet all of the following conditions:

1. The building or other structure is less than or equal to 75 feet in height, with a height to least width ratio of 4 or less, or the building or other structure has a fundamental frequency greater than or equal to 1 hertz.
2. The building or other structure is not sensitive to dynamic effects.
3. The building or other structure is not located on a site for which channeling effects or buffeting in the wake of upwind obstructions warrant special consideration.
4. The building shall meet the requirements of a simple diaphragm building as defined in ASCE 7 Section 6.2, where wind loads are only transmitted to the Main-Wind-Force-Resisting System at the diaphragms.
5. For open buildings, multispans gable roofs, stepped roofs, sawtooth roofs, domed roofs, roofs with slopes greater than 45°, solid free standing walls and solid signs, and roof top equipment apply ASCE 7.

1609.6.2 Symbols and Notations. Coefficients and variables used in the Alternate All-Heights Method equations are as follows:

C_{net} = net-pressure coefficient based on $K_d [(G) (C_p) - (GC_{pi})]$, Ref Table 1609.6.2(2)

G = Gust effect factor equal to 0.85 for rigid structures per ASCE 7 Section 6.5.8.1.

K_d = Wind directionality factor per ASCE 7 Table 6-4.

P_{net} = Design wind pressure to be used in determination of wind loads on buildings or other structures or their components and cladding, in lb/ft² (N/m²).

q_s = Wind velocity stagnation pressure in lb/ft² (N/m²). (Per Table 1609.6.2(1))

1609.6.4.3 Determination of Net Pressure Coefficients, C_{net} . For the design of the Main Wind-Force-Resisting-System and for Components and Cladding, the sum of the internal and external net pressure shall be based on the net pressure coefficient C_{net} .

1. The pressure coefficient, C_{net} , for walls and roofs shall be determined from Table 1609.6.2(2).
2. Where C_{net} may have more than one value, the more severe wind load ~~combination~~ condition shall be used for design.

TABLE 1609.6.2(2)
NET PRESSURE COEFFICIENTS, $C_{NET}^{a,b,c}$

STRUCTURE OR PART THEREOF	DESCRIPTION	C_{net} FACTOR		
		Enclosed	Part Enclosed	
1.Main Wind Force Resisting Frames and Systems	WALLS:		Enclosed	Part Enclosed
	Windward Wall		0.43	0.11
	Leeward Wall		-0.51	-0.83
	Side Wall		-0.66	-0.97
	Parapet Wall	Windward	1.28	1.28
		Leeward	-0.85	-0.85
	ROOFS:		Enclosed	Part Enclosed
	Wind perpendicular to ridge			
	Leeward roof or flat roof		-0.66	-0.97
	Windward roof slopes:			
	Slope < 2:12 (10°)	Case Condition 1	-1.09	-1.41
		Case Condition 2	-0.28	-0.60
	Slope = 4:12 (18°)	Case Condition 1	-0.73	-1.04
		Case Condition 2	-0.05	-0.37
	Slope = 5:12 (23°)	Case Condition 1	-0.58	-0.90
		Case Condition 2	0.03	-0.29
	Slope = 6:12 (27°)	Case Condition 1	-0.47	-0.78
		Case Condition 2	0.06	-0.25
	Slope = 7:12 (30°)	Case Condition 1	-0.37	-0.68

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		<u>Case Condition 2</u>	0.07	-0.25
	Slope 9:12 (37°)	<u>Case Condition 1</u>	-0.27	-0.58
		<u>Case Condition 2</u>	0.14	-0.18
	Slope 12:12 (45°)		0.14	-0.18
	Wind parallel to ridge and flat roofs		-1.09	-1.41
	Non Building Structures: Chimneys, Tanks and Similar Structures:			
		h/D		
		1	7	25
	Square (Wind normal to face)	0.99	1.07	1.53
	Square (Wind on diagonal)	0.77	0.84	1.15
	Hexagonal or Octagonal	0.81	0.97	1.13
	Round	0.65	0.81	0.97
	Open Signs and Lattice Frameworks			
		Ratio of solid to gross area		
		< 0.1	0.1 to 0.29	0.3 to 0.7
	Flat	1.45	1.30	1.16
	Round	0.87	0.94	1.08
2. Components and Cladding not in areas of discontinuity – Roofs and overhangs	Roof Elements and slopes		Enclosed	Partially Enc.
	Gable or Hipped Configurations (Zone 1)			
	Flat < Slope < 6:12 (27°)			
	Positive	10 SF or less	0.58	0.89
		100 SF or more	0.41	0.72
	Negative	10 SF or less	-1.00	-1.32
		100 SF or more	-0.92	-1.23
	Overhang: Flat < Slope < 6:12 (27°)			
	Negative	10 SF or less	-1.45	
		100 SF or more	-1.36	
		500 SF or more	-0.94	
	6:12 (27°) < Slope < 12:12 (45°)			
	Positive	10 SF or less	0.92	1.23
		100 SF or more	0.83	1.15
	Negative	10 SF or less	-1.00	-1.32
		100 SF or more	-0.83	-1.15

	Monosloped Configurations (Zone 1)	Enclosed	Partially Enc.
	Flat < Slope < 7:12 (30°)		
	Positive	10 SF or less	0.49
		100 SF or more	0.41
	Negative	10 SF or less	-1.26
		100 SF or more	-1.09
	Tall flat topped roofs h> 60'	Enclosed	Partially Enc.
	Flat <slope < 2:12 (10°) (Zone 1)		
	Negative	10 SF or less	-1.34
		500 SF or more	-1.00
3.Components and Cladding in areas of discontinuities – Roofs and overhangs	Roof Elements and slopes	Enclosed	Partially Enc.
	Gable or Hipped Configurations at Ridges, Eaves and Rakes (Zone 2)		
	Flat < Slope < 6:12 (27°)		
	Positive	10 SF or less	0.58
		100 SF or more	0.41
	Negative	10 SF or less	-1.68
		100 SF or more	-1.17
	Overhang for Slope Flat < Slope < 6:12 (27°)		
	Negative	10 SF or less	-1.87
		100 SF or more	-1.87
	6:12 (27°) < Slope < 12:12 (45°)		
	Positive	10 SF or less	0.92
		100 SF or more	0.83
	Negative	10 SF or less	-1.17
		100 SF or more	-1.00
	Overhang for 6:12 (27°) < Slope < 12:12 (45°)		
	Negative	10 SF or less	-1.70
		100 SF or more	-1.53

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Monosloped Configurations at Ridges, Eaves and Rakes (Zone 2)			
Flat < Slope < 7:12 (30°)			
Positive	10 SF or less	0.49	0.81
	100 SF or more	0.41	0.72
Negative	10 SF or less	-1.51	-1.83
	100 SF or more	-1.43	-1.74
Tall flat topped roofs h> 60'		Enclosed	Partially Enc.
Flat <slope < 2:12 (10°) (Zone 2)			
Negative	10 SF or less	-2.11	-2.42
	500 SF or more	-1.51	-1.83
Gable or Hipped Configurations at Corners (Zone 3)			
Flat < Slope < 6:12 (27°)		Enclosed	Partially Enc.
Positive	10 SF or less	0.58	0.89
	100 SF or more	0.41	0.72
Negative	10 SF or less	-2.53	-2.85
	100 SF or more	-1.85	-2.17
Overhang for Slope Flat < Slope < 6:12 (27°)			
Negative	10 SF or less	-3.15	
	100 SF or more	-2.13	
6:12 (27°) < Slope < 12:12 (45°)			
Positive	10 SF or less	0.92	1.23
	100 SF or more	0.83	1.15
Negative	10 SF or less	-1.17	-1.49
	100 SF or more	-1.00	-1.32
Overhang for 6:12 (27°) < Slope < 12:12 (45°)		Enclosed	Partially Enc.
Negative	10 SF or less	-1.70	
	100 SF or more	-1.53	
Monosloped Configurations at corners (Zone 3)			

	Flat < Slope < 7:12 (30°)			
	Positive	10 SF or less	0.49	0.81
		100 SF or more	0.41	0.72
	Negative	10 SF or less	-2.62	-2.93
		100 SF or more	-1.85	-2.17
	Tall flat topped roofs h> 60'		Enclosed	Partially Enc.
	Flat < slope < 2:12 (10°) (Zone 3)			
	Negative	10 SF or less	-2.87	-3.19
		500 SF or more	-2.11	-2.42
4. Components and Cladding not in areas of discontinuity – Walls and parapets	Wall Elements: h ≤ 60' (Zone 4)		Enclosed	Partially Enc.
	Positive	10 SF or less	1.00	1.32
		500 SF or more	0.75	1.06
	Negative	10 SF or less	-1.09	-1.40
		500 SF or more	-0.83	-1.15
	Wall Elements: h > 60' (Zone 4)			
	Positive	20 SF or less	0.92	1.23
		500 SF or more	0.66	0.98
	Negative	20 SF or less	-0.92	-1.23
		500 SF or more	-0.75	-1.06
	Parapet Walls			
	Positive		2.87	3.19
	Negative		-1.68	-2.00
	5.Components and Cladding in areas of discontinuity - Walls and parapets	Wall Elements: h ≤ 60' (Zone 5)		Enclosed
Positive		10 SF or less	1.00	1.32
		500 SF or more	0.75	1.06
Negative		10 SF or less	-1.34	-1.66
		500 SF or more	-0.83	-1.0515
Wall Elements: h > 60' (Zone 5)				
Positive		20 SF or less	0.92	1.23
		500 SF or more	0.66	0.98

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	Negative	20 SF or less	-1.68	-2.00
		500 SF or more	-1.00	-1.32
	Parapet Walls			
	Positive		3.64	3.95
	Negative		-2.45	-2.76

- a. Linear interpolation between values in the table is acceptable.
- b. For open buildings, multispans gable roofs, stepped roofs, sawtooth roofs, domed roofs, solid free standing walls and solid signs apply ASCE 7.
- c. Some C_{net} values have been grouped together. Less conservative results may be obtained by applying ASCE 7.

(Portions of proposal not shown remain unchanged)

Commenter's Reason: At meetings in March and June with the ASCE/SEI 7 Wind Load Subcommittee, several improvements to Code Change Proposal S84 were discussed. These include:

- Adding the words regularly shaped to other structures in 1609.6.1 to avoid misapplication.
- Adding the words where wind loads are only transmitted to the Main-Wind-Force-Resisting System at the diaphragms. To Item 4 in 1609.6.1 to avoid misapplication. This change is under consideration by the ASCE/SEI 7 Wind Load Subcommittee and will appear in ASCE/SEI 7-10.
- Moving and expanding Footnote 2 to Table 1609.6.2(2) to Item 5 in 1609.6.1 to make it more visible.
- Changing the definition of q_s in 1609.6.2 from to Wind velocity pressure to Wind stagnation pressure to avoid confusion with ASCE/SEI 7.
- Changing the words wind load combination in Item 2 of 1609.6.4.3 to wind load condition to avoid confusion with the load combinations of Section 1605. In Table 1609.6.2(2) the Case 1 and Case 2 categories for wind perpendicular to a ridge were also changed from ~~case~~ to condition for the same reason.
- In Table 1609.6.2(2) Item 5. Components and Cladding in areas of discontinuity - Walls and parapets, the value for Wall Elements: $h \leq 60'$ (Zone 5), negative pressure for 500 SF or more for a Partially Enclosed condition was changed from 1.05 to 1.15 to correct a minor typographical mistake.

Final Hearing Results

S84-07/08

AMPC1, 2, 3

Code Change No: S88-07/08

Original Proposal

Section: 1612.3.2 (New)

Proponent: Rebecca C. Quinn, R.C. Quinn Consulting, Inc., representing US Department of Homeland Security, Federal Emergency Management Agency

Revise as follows:

1612.3.1 (Supp) Design flood elevations. Where design flood elevations are not included in the flood hazard areas established in Section 1612.3, or where floodways are not designated, the building official is authorized to require the applicant to:

1. Obtain and reasonably utilize any design flood elevation and floodway data available from a federal, state or other source; or
2. Determine the design flood elevation and/or floodway in accordance with accepted hydrologic and hydraulic engineering practices used to define special flood hazard areas. Determinations shall be undertaken by a registered design professional who shall document that the technical methods used reflect currently accepted engineering practice.

1612.3.2 Determination of impacts. In riverine flood hazard areas where design flood elevations are specified but floodways have not been designated, the applicant shall demonstrate that the cumulative effect of the proposed buildings and structures, when combined with all other existing and anticipated flood hazard area encroachments, will not increase the design flood elevation more than 1 foot (305 mm) at any point within the jurisdiction of the applicable governing authority.

Reason: The purpose of this code change is to improve consistency with the requirements of the National Flood Insurance Program (NFIP) regarding development in flood hazard areas where base (or design) flood elevations are shown on the Flood Insurance Rate Map, but analyses to delineate the floodway were not performed. Development in riverine floodplains can increase flood levels and loads on other properties, especially if it occurs in areas known as floodways that must be reserved to convey flood flows. The floodway, as defined in 1612.2, is the area along riverine waterways that "must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than a designated height." For the situation addressed by this code change, the designed height is one foot.

Similar language appears in four locations in the I-Codes: (1) IBC 1803.4(4) to address proposed grading and filling; (2) IBC Appendix G103.4; (3) IBC Appendix J101.2; and IRC R324.1.3.2. The requirement to determine cumulative impacts has been part of the NFIP for more than 20 years and has been administered by more than 20,000 local jurisdictions that participate in the NFIP.

References:

Title 44 Code of Federal Regulations Parts 59 and 60, Regulations for Floodplain Management and Flood Hazard Identification." Online at <http://www.fema.gov/business/nfip/laws1.shtm>.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: While this may already be a part of the federal regulations, the committee felt it includes ill-defined terminology. Particularly the phrase "anticipated flood hazard areas" leaves too much to interpretation.

Assembly Action:

None

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Rebecca C. Quinn, RCQuinn Consulting, Inc, representing Department of Homeland Security/Federal Emergency Management Agency, requests Approval as Modified by this Public Comment.

Replace proposal as follows:

1612.3.2 Determination of impacts. In riverine flood hazard areas where design flood elevations are specified but floodways have not been designated, the applicant shall provide a floodway analysis that demonstrates that the proposed work will not increase the design flood elevation more than 1 foot (305 mm) at any point within the jurisdiction of the applicable governing authority.

Commenter's Reason: This public comment modifies the code change by replacing the phrase considered to leave too much to interpretation with a statement that a floodway analysis is required to determine impacts. Development in riverine floodplains can increase flood levels and loads on other properties, especially if it occurs in areas known as floodways that must be reserved to convey flood flows. Floodways are the channels and those portions of riverine floodplains that convey most of the volume of floodwaters. Floodway analyses have been performed for decades. Commercial software packages for these analyses are readily available and FEMA provides software and technical guidance at www.fema.gov/plan/prevent/fhm/frm_soft.shtm#1.

The intent of the proposal is to improve consistency with the National Flood Insurance Program which requires applicants to demonstrate whether their proposed work will increase flood levels in floodplains where the NFIP's Flood Insurance Rate Map shows Base Flood Elevations, but floodways are not shown. A small percentage of floodplains where FEMA has specified Base Flood Elevations do not have designated floodways.

Final Hearing Results

S88-07/08

AMPC

Code Change No: S89-07/08

Original Proposal

Sections: 1612.4, 1801.1

Proponent: Philip Brazil, PE, SE, Reid Middleton, Inc., representing himself

Revise as follows:

1612.4 Design and construction. The design and construction of buildings and structures located in flood hazard areas, including flood hazard areas subject to high velocity wave action, shall be in accordance with Chapter 5 of ASCE 7 and with ASCE 24.

1801.1 Scope. The provisions of this chapter shall apply to building and foundation systems ~~in those areas not subject to scour or water pressure by wind and wave action. Buildings and foundations subject to such scour or water pressure loads shall be designed in accordance with Chapter 16.~~

Reason: The purpose for this proposal is to align the provisions of the IBC, ASCE 7 and ASCE 24 with respect to the structural design of buildings and other structures in flood hazard areas. The current language implies that compliance with IBC Chapter 18 is required except for buildings and foundations subject to scour or water pressure by wind and wave action and the applicable requirements for them are specified in Chapter 16. The load combinations of IBC Section 1605 would not apply because there are none for flood loads. Sections 1605.2.2 and 1605.3.1.2 reference ASCE 7. Sections 2.3.3 and 2.4.2 of ASCE 7-05, in turn, specify load combinations that include flood loads. IBC Sections 1603.1.6 and 1612 specify requirements for determining flood hazard areas and documenting them on the construction documents. There are no other provisions in Chapter 16 specific to the structural design of buildings and other structures in flood hazard areas except for a reference to ASCE 24 in Section 1612.4. Chapter 5 of ASCE 7, however, contains comprehensive provisions for the determination of loads subjected to buildings and other structures located in "areas prone to flooding as defined on a flood hazard map."

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: This code change adds a straightforward reference to the ASCE 7 flood load requirements, which has been missing from Section 1612.

Assembly Action:

None

Final Hearing Results

S89-07/08

AS

Code Change No: S92-07/08

Original Proposal

Section: 1613.6.6 (New)

Proponent: James S. Lai, SE, representing Structural Engineers Association of California

Add new text as follows:

1613.6.6 Minimum distance for building separation. All buildings and structures shall be separated from adjoining structures. Separations shall allow for the maximum inelastic response displacement (δ_M). δ_M shall be determined at critical locations with consideration for both translational and torsional displacements of the structure using Equation 16-45.

$$\delta_M = C_d \delta_{\max} \quad \text{(Equation 16-45)}$$

Where

C_d = Deflection amplification factor in Table 12.2-1 of ASCE 7.

δ_{\max} = Maximum displacement defined in Section 12.8.4.3 of ASCE 7.

Adjacent buildings on the same property shall be separated by a distance not less than δ_{MT} , determined by Equation 16-46.

$$\delta_{MT} = \sqrt{(\delta_{M1})^2 + (\delta_{M2})^2} \quad \text{(Equation 16-46)}$$

Where

δ_{M1}, δ_{M2} = The maximum inelastic response displacements of the adjacent buildings in accordance with Equation 16-45.

Where a structure adjoins a property line not common to a public way, the structure shall also be set back from the property line by not less than the maximum inelastic response displacement, δ_M , of that structure.

Exceptions:

1. Smaller separations or property line setbacks shall be permitted when justified by rational analyses.
2. Buildings and structures assigned to the Seismic Design Category A, B or C.

Reason: Purpose: To clarify requirements for separation distance between adjacent buildings.

Section 12.12.3 of ASCE 7-05 including Supplement No. 1 does not provide requirements for separation distances between adjacent buildings. Requirements for separation distances between adjacent buildings, not structurally connected, were included in IBC 2000 and 2003. However, when ASCE 7-05 was adopted by reference for IBC 2006, these requirements were omitted. In addition, ASCE 7-05 defines (δ_x) in Section 12.8.6 as the deflection of Level x at the center of mass. The actual displacement that needs to be used for building separation is the displacement at critical locations with consideration of both the translational and torsional displacements. These values can be significantly different.

This code change restores requirements for building separation in prior editions of IBC, and establishes minimum separation distance between adjoining buildings which are not structurally connected. The purpose of seismic separation is to permit adjoining buildings, or parts thereof, to respond to earthquake ground motion independently and thus preclude possible structural and non-structural damage caused by pounding between buildings or other structures.

References:

1. ICC, *2003 International Building Code*, "Section 1620.3.6, Building Separations; IBC 2003 Section 1620.4.5, Building Separations;" International Code Council, Country Club Hills, IL.
2. ICBO, *1997 Uniform Building Code, Volume 2, Structural Engineering Provisions*, "Section 1630.9.2, Determination of δ_M ; Section 1630.10.1, General; and Section 1633.2.11, Building Separations," International Conference of Building Officials, Whittier, CA.
3. SEAOC, *1999 Recommended Lateral Force Requirements and Commentary*, "Section C108.2.11, *Building Separations*," Structural Engineers Association of California, Sacramento, CA.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Modified

Modify proposal as follows:

1613.6.6 Minimum distance for building separation. All buildings and structures shall be separated from adjoining structures. Separations shall allow for the maximum inelastic response displacement (δ_M). δ_M shall be determined at critical locations with consideration for both translational and torsional displacements of the structure using Equation 16-45.

$$\delta_M = \frac{C_d \delta_{\max}}{I} \quad \text{(Equation 16-45)}$$

Where

C_d = Deflection amplification factor in Table 12.2-1 of ASCE 7.

δ_{\max} = Maximum displacement defined in Section 12.8.4.3 of ASCE 7

I = Importance factor in accordance with Section 11.5.1 of ASCE 7.

Adjacent buildings on the same property shall be separated by a distance not less than δ_{MT} , determined by Equation 16-46.

$$\delta_{MT} = \sqrt{(\delta_{M1})^2 + (\delta_{M2})^2} \quad \text{(Equation 16-46)}$$

Where

δ_{M1} , δ_{M2} = The maximum inelastic response displacements of the adjacent buildings in accordance with Equation 16-45.

Where a structure adjoins a property line not common to a public way, the structure shall also be set back from the property line by not less than the maximum inelastic response displacement, δ_{M1} , of that structure.

Exceptions:

1. Smaller separations or property line setbacks shall be permitted when justified by rational analyses.
2. Buildings and structures assigned to the Seismic Design Category A, B or C.

Committee Reason: Adding a requirement for building separation fills a void in the current earthquake provisions. The modification introduces the importance factor into the equation for determining maximum inelastic response to be consistent with ASCE 7.

Assembly Action:

None

Final Hearing Results

S92-07/08

AM

Code Change No: S93-07/08

Original Proposal

Section: 1613.6.6 (New)

Proponent: Jim W. Sealy, FAIA; Robert E. Bachman, SE; and John D. Gillengerten, Building Seismic Safety Council of the National Institute of Building Sciences, representing FEMA/BSSC Code Resource Support Committee

Add new text as follows:

1613.6.6 HVAC Ductwork with $I_p = 1.5$ Seismic supports are not required for HVAC ductwork with $I_p = 1.5$ if either of the following conditions are met for the full length of each duct run:

1. HVAC ducts are suspended from hangers 12 in. (305 mm) or less in length with hangers detailed to avoid significant bending of the hangers and their attachments or
2. HVAC ducts have a cross-sectional area of less than 6 ft² (0.557 m²).

Reason: This proposal extends the exemptions from seismic bracing requirements to include small ducts where $I_p=1.5$. All ducts are generally braced or guyed to prevent lateral motion or swing. Given the low inertial loads associated with small ducts, this prescriptive bracing is sufficient for seismic loads as well.

The proposed change should result in reduced cost in the installation of HVAC ducting for buildings assigned to Seismic Design Category D, E, and F where HVAC system is assigned a component importance factor of 4.5 (such as hospitals). There will be no change in cost in California amendments to the 2006 IBC.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: This proposal eliminates unnecessary ductwork bracing for ducts that are small or where minimum prescriptive hangers are considered adequate.

Assembly Action:

None

Final Hearing Results

S93-07/08

AS

Code Change No: **S94-07/08**

Original Proposal

Section: 1613.6.6 (New)**Proponent:** Bonnie Manley, American Iron and Steel Institute, representing American Institute of Steel Construction**Add new text as follows:****1613.6.6 Steel plate shear wall height limits.** Modify Section 12.2.5.4 of ASCE 7 as follows:

12.2.5.4 Increased Building Height Limit for Steel Braced Frames, Special Steel Plate Shear Walls and Special Reinforced Concrete Shear Walls. The height limits in Table 12.2-1 are permitted to be increased from 160 ft (50 m) to 240 ft (75 m) for structures assigned to Seismic Design Categories D or E and from 100 ft (30 m) to 160 ft (50 m) for structures assigned to Seismic Design Category F that have steel braced frames, special steel plate shear walls or special reinforced concrete cast-in-place shear walls and that meet both of the following requirements:

1. The structure shall not have an extreme torsional irregularity as defined in Table 12.2-1 (horizontal structural irregularity Type 1b).
2. The braced frames or shear walls in any one plane shall resist no more than 60 percent of the total seismic forces in each direction, neglecting accidental torsional effects.

Reason: Special Steel Plate Shear Wall (SPSW) systems were first introduced in the 2005 editions of ASCE 7 and AISC 341. During the incorporation of the system's seismic design parameters and height limitations into ASCE 7, Table 12.2-1, the inclusion of this system in the permitted height increase of ASCE 7, Section 12.2.5.4 was inadvertently overlooked. This minor modification to ASCE 7, Section 12.2.5.4 corrects that oversight.

Please note, we will be pursuing a correction to Section 12.2.5.4 for the 2010 edition of ASCE 7, so it is anticipated that this amendment to ASCE 7-05 will be necessary only for the 2009 edition of the IBC.

Additional Background: FEMA 450 (2003), *NEHRP Recommended Provisions For Seismic Regulations For New Buildings And Other Structures*, which is the source document for ASCE 7-05, states the following in Section 4.3.1.4 and its associated commentary:

Provisions:

4.3.1.4 Seismic Design Category D. The structural framing system for structures assigned to Seismic Design Category D shall comply with Sec. 4.3.1.3 and the additional requirements of this section.

4.3.1.4.1 Building height limits. The height limits in Table 4.3-1 are permitted to be increased to 240 ft (70 m) in buildings that have steel braced frames or concrete cast-in-place shear walls if such buildings are configured such that the braced frames or shear walls arranged in any one plane conform to the following:

1. The braced frames or cast-in-place special reinforced concrete shear walls in any one plane shall resist no more than 60 percent of the total seismic forces in each direction, neglecting torsional effects, and
2. The seismic force in any braced frame or shear wall resulting from torsional effects shall not exceed 20 percent of the total seismic force in that braced frame or shear wall.

Commentary:

4.3.1.4 Seismic Design Category D. Sec. 4.3.1.4 covers Seismic Design Category D, which compares roughly to California design practice for normal buildings away from major faults. In keeping with the philosophy of present codes for zones of high seismic risk, these requirements continue limitations on the use of certain types of structures over 160 ft (49 m) in height but with some changes. Although it is agreed that the lack of reliable data on the behavior of high-rise buildings whose structural systems involve shear walls and/or braced frames makes it convenient at present to establish some limits, the values of 160 ft (49 m) and 240 ft (73 m) introduced in these requirements are arbitrary. Considerable disagreement exists regarding the adequacy of these values, and it is intended that these limitations be the subject of further study.

According to these requirements require that buildings in Category D over 160 ft (49 m) in height must have one of the following seismic-force-resisting systems:

1. A moment resisting frame system with special moment frames capable of resisting the total prescribed seismic force...
2. A dual system as defined in this chapter, wherein the prescribed forces are resisted by the entire system and the special moment frame is designed to resist at least 25 percent of the prescribed seismic force...

3. *The use of a shear wall (or braced frame) system of cast-in-place concrete or structural steel up to a height of 240 ft (73 m) is permitted only if braced frames or shear walls in any plane do not resist more than 60 percent of the seismic design force including torsional effects and the configuration of the lateral-force-resisting system is such that torsional effects result in less than a 20 percent contribution to the strength demand on the walls or frames. The intent is that each of these shear walls or braced frames be in a different plane and that the four or more planes required be spaced adequately throughout the plan or on the perimeter of the building in such a way that the premature failure of one of the single walls or frames will not lead to excessive inelastic torsion.*

Although a structural system with lateral force resistance concentrated in the interior core (Figure C4.3-1) is acceptable according to the Provisions, it is highly recommended that use of such a system be avoided, particularly for taller buildings. The intent is to replace it by the system with lateral force resistance distributed across the entire building (Figure C4.3-2). The latter system is believed to be more suitable in view of the lack of reliable data regarding the behavior of tall buildings having structural systems based on central cores formed by coupled shear walls or slender braced frames.

Based upon the provision language and accompanying commentary, there seems to be no reason to not include special SPSW in the increased height limitations of ASCE 7, Section 12.2.5.4.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: This code change fills a void in the current ASCE 7 provision, by clarifying that it also applies to special steel plate shear wall systems.

Assembly Action:

None

Final Hearing Results

S94-07/08

AS

Code Change No: S96-07/08

Original Proposal

Sections: 1613.7 (New), 1613.7.1 (New)

Proponent: Jim Messersmith, Jr. PE, Portland Cement Association

Add new text as follows:

1613.7 General. The text of ASCE 7 shall be modified as indicated in Section 1613.7.1.

1613.7.1 ASCE 7, Section 11.7.5. Modify ASCE 7, Section 11.7.5 to read as follows:

11.7.5 Anchorage of walls. Walls shall be anchored to the roof and all floors and members that provide lateral support for the wall or that are supported by the wall. The anchorage shall provide a direct connection between the walls and the roof or floor construction. The connections shall be capable of resisting the forces specified in Section 11.7.3 applied horizontally, substituted for *E* in load combinations of Section 2.3 or 2.4.

Reason: Since ASCE 7-05 will be the loading standard referenced in the 2009 IBC, the only recourse to getting changes made to ASCE 7-05 is through modifications to the standard within the IBC.

The requirement that anchors attaching concrete and masonry walls to supporting construction be designed for a lower bound value of 280 pounds per linear foot is excessive and discriminatory considering that anchorage of walls of other materials, regardless of their mass, is required to be designed for a horizontal force of 5% of the weight of the wall tributary to the anchor.

To illustrate the punitive nature of the provision, consider two 10-foot high walls that are representative of walls used in single family dwellings and small commercial buildings; one a 5.5-inch thick concrete wall, the other a light-framed wall with 4-inch nominal masonry veneer anchored to the wall framing. The weight of the light-framed wall, including veneer, is estimated to be 45 psf; therefore, the weight tributary to an anchor at the top of the wall is 225 plf ($45 * (10/2) = 225$). The required design anchorage force for this wall is 11 plf ($225 * 0.05 = 11$). On the other hand, for the 5.5-inch concrete wall, which weighs 69 psf, the weight tributary to an anchor at the top of the wall is 345 plf ($69 * (10/2) = 345$). Based on the requirement that applies to walls of other than concrete or masonry, the required anchorage design force for the concrete wall should be 17 plf ($345 * 0.05 = 17$); however, 280 plf must be used to design the anchorage.

Let's examine how the 280 plf requirement compares to wind design. ASCE 7, Section 6.1.4.2 requires that components and cladding be designed for a minimum service level design wind pressure of 10 psf. For our example walls using this minimum design wind pressure, the strength level (factored) force at the top of the wall due to wind is 80 plf ($10 * (10/2) * 1.6 = 80$). Now let's determine what basic wind speed is required to produce a factored design force at the top of the wall of 280 plf (strength level). The service level (unfactored) force comparable to 280 plf is 175 plf ($280/1.6 = 175$). Since 175 plf is based on a tributary wall height of 5 feet, the design wind pressure is 35 psf ($175/5 = 35$). From ASCE 7, Figure 6-3, for a building in exposure B, height of 30 feet, K_{zt} of 1.0, and effective wind area of less than or equal to 10 square feet for wall area 4, the negative design pressure for a basic wind speed of 140 mph is 38.2 psf. Therefore, the requirement that the 5.5-inch, 10-foot high concrete wall be anchored against a force of 280 plf is the same as requiring that the connection be designed for a basic wind speed of approximately 135 mph.

It is obvious that in a world that is rapidly embracing performance-based design, the requirement that anchorages for concrete and masonry walls be designed for a force of 280 plf is not necessary and discriminates against these products. In addition, by singling out walls of concrete and masonry, walls of other materials that could have comparable mass per unit area are exempt from the requirement. Based on the foregoing, the requirement that anchorages for concrete and masonry walls be designed for 280 plf should be deleted.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The committee believes this is a reasonable change to the ASCE 7 requirement for anchorage of walls and it is consistent with the committee's action on S57-07/08.

Assembly Action:

None

Final Hearing Results

S96-07/08

AS

Code Change No: **S101-07/08**

Original Proposal

Section: 1614 (New)

Proponent: Ronald O. Hamburger, SE, Simpson Gumpertz & Heger, Inc, representing National Council of Structural Engineers Associations/Ad Hoc Joint Industry Committee on Structural Integrity

Add new section as follows:

SECTION 1614
STRUCTURAL INTEGRITY

1614.1 General. Buildings and other structures assigned to Occupancy Category II, III, or IV, exceeding three stories above grade plane shall comply with the requirements of this section. Frame structures shall comply with the requirements of Section 1614.3. Bearing wall structures shall comply with the requirements of Section 1614.4.

Exception: Structures other than buildings with structural systems that are not like building structures including, but not limited to, billboards, signs, silos, tanks, stacks, mechanical and electrical equipment.

1614.2 Definitions. The following words and terms shall, for the purposes of Section 1614, have the meanings shown herein.

BEARING WALL STRUCTURE. A building or other structure in which vertical loads from floors and roofs are primarily supported by walls.

FRAME STRUCTURE. A building or other structure in which vertical loads from floors and roofs are primarily supported by columns.

1614.3 Frame structures. Frame structures shall comply with the requirements of this section.

1614.3.1 Concrete frame structures. Frame structures constructed primarily of reinforced or prestressed concrete, either cast-in-place or precast, or a combination of these, shall conform to the requirements of ACI 318 Sections 7.13, 13.3.8.5, 13.3.8.6, 16.5 and 18.12.6, b18.12.7 and 18.12.8 as applicable. Where ACI 318 requires that nonprestressed reinforcing or prestressing steel pass through the region bounded by the longitudinal column reinforcement, that reinforcing or prestressing steel shall have a minimum nominal tensile strength equal to 2/3 of the required one-way vertical strength of the connection of the floor or roof system to the column in each direction of beam or slab reinforcement passing through the column.

Exception: Where concrete slabs with continuous reinforcing having an area not less than 0.0015 times the concrete area in each of two orthogonal directions are present and are either monolithic with or equivalently bonded to beams, girders or columns, the longitudinal reinforcing or prestressing steel passing through the column reinforcement shall have a nominal tensile strength of 1/3 of the required one-way vertical strength of the connection of the floor or roof system to the column in each direction of beam or slab reinforcement passing through the column.

1614.3.2 Structural steel, open web steel joist or joist girder, or composite steel and concrete frame structures. Frame structures constructed with a structural steel frame or a frame composed of open web steel joists, joist girders with or without other structural steel elements or a frame composed of composite steel or composite steel joists and reinforced concrete elements shall conform to the requirements of this section.

1614.3.2.1 Columns. Each column splice shall have the minimum design strength in tension to transfer the design dead and live load tributary to the column between the splice and the splice or base immediately below.

1614.3.2.2 Beams. End connections of all beams and girders shall have a minimum nominal axial tensile strength equal to the required vertical shear strength for Allowable Strength Design (ASD) or 2/3 of the required shear strength for Load and Resistance Factor Design (LRFD) but not less than 10 kips (45 kN). For the purpose of this section, the shear force and the axial tensile force need not be considered to act simultaneously.

Exception: Where beams, girders, open web joist, and joist girders support a concrete slab or concrete slab on metal deck that is attached to the beam or girder with not less than 3/8 in. (9.5 mm) diameter headed shear studs, at a spacing of not more than 12 in. (305 mm) on center, averaged over the length of the member, or other attachment having equivalent shear strength, and the slab contains continuous distributed reinforcement in each of two orthogonal directions with an area not less than 0.0015 times the concrete area, the nominal axial tension strength of the end connection shall be permitted to be taken as half the required vertical shear strength for ASD or 1/3 of the required shear strength for LRFD, but not less than 10 kips (45 kN).

1614.4 Bearing wall structures. Bearing wall structures shall have vertical ties in all load bearing walls and longitudinal ties, transverse ties, and perimeter ties at each floor level in accordance with this section and as shown in Figure 1614.4.

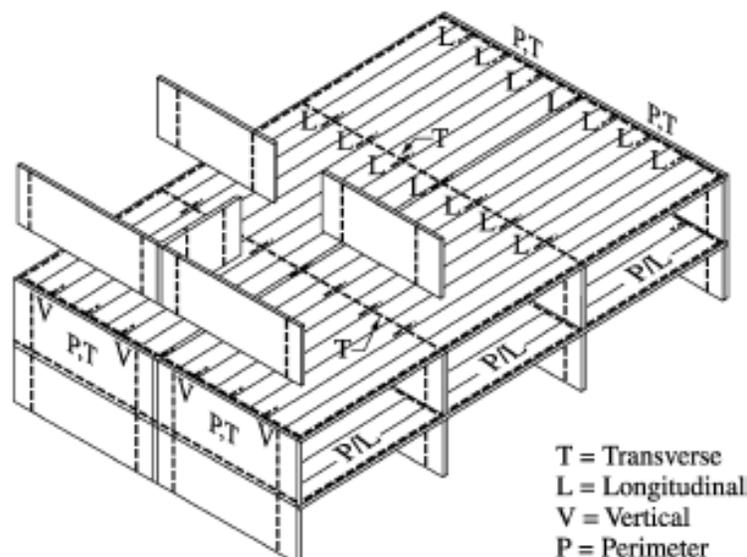


FIGURE 1614.4
LONGITUDINAL, PERIMETER, TRANSVERSE AND VERTICAL TIES

1614.4.1 Concrete wall structures. Precast bearing wall structures constructed solely of reinforced or prestressed concrete, or combinations of these shall conform to the requirements of Sections 7.13, 13.3.8.5 and 16.5 of ACI 318.

1614.4.2 Other bearing wall structures. Ties in bearing wall structures other than those covered in Section 1614.4.1 shall conform to this section.

1614.4.2.1 Longitudinal ties. Longitudinal ties shall consist of continuous reinforcement in slabs; continuous or spliced decks or sheathing; continuous or spliced members framing to, within, or across walls; or, connections of continuous framing members to walls. Longitudinal ties shall extend across interior load bearing walls and shall connect to exterior load bearing walls and shall be spaced at not greater than 10 feet (3038 mm) on center. Ties shall have a minimum nominal tensile strength, T_T , given by Equation 16-45. For ASD the minimum nominal tensile strength may be taken as 1.5 times the allowable tensile stress times the area of the tie.

$$T_T = wLs \leq \alpha_T s \quad \text{(Equation 16-45)}$$

where:

L = the span of the horizontal element in the direction of the tie, between bearing walls, ft, (m)

w = the weight per unit area of the floor or roof in the span being tied to or across the wall, psf, (N/m²)

S = the spacing between ties, ft (m)

α_T = a coefficient with a value of 1,500 lb/ft (2.25 kN/m) for masonry bearing wall structures and a value of 375 lb/ft (0.6 kN/m) for structures with bearing walls of light wood or cold formed steel frame construction.

1614.4.2.2 Transverse ties. Transverse ties shall consist of continuous reinforcement in slabs; continuous or spliced decks or sheathing; continuous or spliced members framing to, within, or across walls; or, connections of continuous framing members to walls. Transverse ties shall be placed no farther apart than the spacing of load bearing walls. Transverse ties shall have minimum nominal tensile strength T_T , given by Equation 16-45. For ASD the minimum nominal tensile strength may be taken as 1.5 times the allowable tensile stress times the area of the tie.

1614.4.2.3 Perimeter ties. Perimeter ties shall consist of continuous reinforcement in slabs; continuous or spliced decks or sheathing; continuous or spliced members framing to, within, or across walls; or, connections of continuous framing members to walls. Ties around the perimeter of each floor and roof shall be located within 4 feet (1219 mm) of the edge and shall provide a nominal strength in tension not less than T_p , given by Equation 16-46. For ASD the minimum nominal tensile strength may be taken as 1.5 times the allowable tensile stress times the area of the tie.

$$T_p = 200w \leq \beta_T \quad \text{(Equation 16-46)}$$

For SI:

$$T_p = 90.7w \leq \beta_T$$

where

w = as defined in Section 1614.4.2.1

β_T = a coefficient with a value of 16,000 lbs (7,200 KN) for structures with masonry bearing walls and a value of 4,000 lbs (1,300 KN) for structures with bearing walls of light wood or cold formed steel frame construction.

1614.4.3.4 Vertical ties. Vertical ties shall consist of continuous or spliced reinforcing, continuous or spliced members, wall sheathing or other engineered systems. Vertical tension ties shall be provided in bearing walls and shall be continuous over the height of the building. The minimum nominal tensile strength for vertical ties within a bearing wall shall be equal to the weight of the wall within that story plus the weight of diaphragm tributary to the wall in the story below. No fewer than two ties shall be provided for each wall. The strength of each tie need not exceed 3,000 lb/ft (450 kN/m) of wall tributary to the tie for walls of masonry construction or 750 lb/ft (140 kN/m) of wall tributary to the tie for walls of light wood or steel frame construction.

Reason: This proposal was developed by a broad industry coalition that includes participation by the National Council of Structural Engineers Associations, the Structural Engineering Institute of the American Society of Civil Engineers, the American Institute of Architects, the American Concrete Institute, the American Forest & Paper Association, the American Iron and Steel Institute, the American Institute of Steel Construction, the Masonry Alliance for Codes and Standards, The Masonry Society, the Portland Cement Association, the Steel Joist Institute, the

Precast/Prestressed Concrete Institute. Corresponding members included the International Code Council and the National Fire Protection Association. In addition, there was nonvoting participation by the National Institute of Building Sciences and the National Institute of Standards and Technology.

It is the general consensus of NCSEA and the other members of the Ad Hoc Joint Industry Committee on Structural Integrity that the requirements already embodied in the building codes and standards together with the common structural design and construction practices prevalent in the United States today provide the overwhelming majority of structures with adequate levels of reliability and safety. The proposed provisions contained in this proposal are predicated upon requirements contained within the ACI 318 for many years. by adapting those requirements to structures of other construction types based on the differing conditions of weight and detailing. It is the opinion of the Ad Hoc Joint Industry Committee that these provisions will generally enhance the general structural integrity and resistance of structures by establishing minimum requirements for tying together the primary structural elements.

No cost impact on structures that are three stories or less in height. For some structures exceeding three stories in height, this proposal may result in minor increases in structural cost due to the additional strength of connections that are required. However, as the provisions contained in this proposal embody common design practices employed by many structural engineers, for many structures, the cost impact will be negligible.

Cost Impact: No cost impact on structures that are three stories or less in height. For some structures exceeding three stories in height, this proposal may result in minor increases in structural cost due to the additional strength of connections that are required. However, as the provisions contained in this proposal embody common design practices employed by many structural engineers, for many structures, the cost impact will be negligible.

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: There is a need for some structural integrity measures and some committee members feel this proposal would be a good step. However, it appears, as proposed, the current ACI 318 provisions for concrete have been extended to other materials without adequate explanation. The logic in doing so is lacking. These provisions would involve too many buildings that do not have integrity issues and there is no demonstrated need for enhancing these structures. There are also concerns about the consequences of requiring these provisions for buildings that are currently built all the time. There is some concern regarding how, or if, this analysis would relate to other required loading conditions – in particular, lateral loads.

Assembly Action:

None

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because public comments were submitted.

Public Comment 1:

Paul K. Heilstedt, PE, FAIA, Chair, representing ICC Code Technology Committee and Gerry Jones/Herman Brice, representing NIBS/MMC Committee for Translating the NIST World Trade Center Investigation Recommendations into Building Codes, request Approval as Modified by this Public Comment.

Modify proposal as follows:

1614.1 General. Buildings ~~classified as high rise buildings in accordance with Section 403 and other structures~~ assigned to Occupancy Category II, III, or IV, ~~exceeding three stories above grade plane~~ shall comply with the requirements of this section. Frame structures shall comply with the requirements of Section 1614.3. Bearing wall structures shall comply with the requirements of Section 1614.4.

~~**Exception:** Structures other than buildings with structural systems that are not like building structures including, but not limited to, billboards, signs, silos, tanks, stacks, mechanical and electrical equipment.~~

1614.4.2.1 Longitudinal ties. Longitudinal ties shall consist of continuous reinforcement in slabs; continuous or spliced decks or sheathing; continuous or spliced members framing to, within, or across walls; or, connections of continuous framing members to walls. Longitudinal ties shall extend across interior load bearing walls and shall connect to exterior load bearing walls and shall be spaced at not greater than 10 feet (3038 mm) on center. Ties shall have a minimum nominal tensile strength, T_T , given by Equation 16-45. For ASD the minimum nominal tensile strength ~~may shall be permitted to be~~ taken as 1.5 times the allowable tensile stress times the area of the tie.

$$T_T = wLs \leq \alpha_T s \qquad \text{(Equation 16-45)}$$

where:

- L = the span of the horizontal element in the direction of the tie, between bearing walls, ft, (m)
- w = the weight per unit area of the floor or roof in the span being tied to or across the wall, psf, (N/m²)
- S = the spacing between ties, ft (m)
- α_T = a coefficient with a value of 1,500 lb/ft (2.25 kN/m) for masonry bearing wall structures and a value of 375 lb/ft (0.6 kN/m) for structures with bearing walls of ~~light wood or cold formed steel frame construction.~~

1614.4.2.3 Perimeter ties. Perimeter ties shall consist of continuous reinforcement in slabs; continuous or spliced decks or sheathing; continuous or spliced members framing to, within, or across walls; or, connections of continuous framing members to walls. Ties around the perimeter of each floor and roof shall be located within 4 feet (1219 mm) of the edge and shall provide a nominal strength in tension not less than T_p , given by Equation 16-46. For ASD the minimum nominal tensile strength ~~may~~ shall be permitted to be taken as 1.5 times the allowable tensile stress times the area of the tie.

$$T_p = 200w \leq \beta_T \quad (\text{Equation 16-46})$$

For SI:

$$T_p = 90.7w \leq \beta_T$$

where

w = as defined in Section 1614.4.2.1

β_T = a coefficient with a value of 16,000 lbs (7,200 kN) for structures with masonry bearing walls and a value of 4,000 lbs (1,300 kN) for structures with bearing walls of ~~light wood~~ or cold formed steel frame construction.

1614.4.3.4 Vertical ties. Vertical ties shall consist of continuous or spliced reinforcing, continuous or spliced members, wall sheathing or other engineered systems. Vertical tension ties shall be provided in bearing walls and shall be continuous over the height of the building. The minimum nominal tensile strength for vertical ties within a bearing wall shall be equal to the weight of the wall within that story plus the weight of diaphragm tributary to the wall in the story below. No fewer than two ties shall be provided for each wall. The strength of each tie need not exceed 3,000 lb/ft (450 kN/m) of wall tributary to the tie for walls of masonry construction or 750 lb/ft (140 kN/m) of wall tributary to the tie for walls of ~~light wood~~ or steel frame construction.

(Portions of proposal not shown remain unchanged)

Commenter's Reason: As noted in the reason for disapproval, there is a need for structural integrity provisions in the code and the reason further states that the provisions would involve too many building that do not have integrity issues. The CTC concurs with this philosophy - the need for such provisions should be a function of the relative risk. Low rise buildings which typically employ a less sophisticated structural system do not represent the same risk as taller buildings such as high rise buildings. Further, inclusion of Category II buildings also represents a large volume of buildings which would envelope a large population of buildings without detailing the risk. Category III buildings which are noted in Table 1604.5 of the code as "representing a substantial hazard to human life in the event of failure" such as high occupant load buildings, as well as Category IV buildings which are classified as "essential facilities" such as hospitals, warrant such provisions.

This public comment responds to these two fundamental issues by limiting the application to only Category III and IV buildings which are considered high rises.

Sections 164.4.2.1, 1614.4.2.3 and 1614.4.3.4 are correspondingly revised to remove the reference to wood construction as the application is now limited to high rises for which wood bearing walls would not be permitted based on type of construction.

Code issues are assigned to the CTC by the ICC Board as "areas of study". Information on the CTC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CTC effort can be downloaded from the following website: <http://www.iccsafe.org/cs/cc/ctc/index.html>. Since its inception in April/2005, the CTC has held fifteen meetings - all open to the public. This public comment is a result of the CTC's investigation of the area of study entitled "NIST World Trade Center Recommendations". The CTC web page for this area of study is: <http://www.iccsafe.org/cs/cc/ctc/WTC.html>

Final Hearing Results

S101-07/08

AMPC1

Code Change No: S102-07/08

Original Proposal

Section: 1702

Proponent: Tony Crimi, A.C. Consulting Solutions Inc., representing North American Insulation Manufacturers' Association (NAIMA)

THIS CODE CHANGE PROPOSAL IS ON THE AGENDA OF THE IBC FIRE SAFETY CODE DEVELOPMENT COMMITTEE. SEE THE HEARING ORDER FOR THE IBC FIRE SAFETY CODE DEVELOPMENT COMMITTEE.

Add new definitions as follows:

SECTION 1702 DEFINITIONS

INTUMESCENT FIRE RESISTANT COATINGS. Thin film liquid mixture applied to substrates by brush, roller, spray or trowel which expands into a protective foamed layer to provide fire-resistant protection of the substrates when exposed to flame or intense heat.

MASTIC FIRE RESISTANT COATINGS. Liquid mixture applied to a substrate by brush, roller, spray or trowel that provides fire resistant protection of a substrate when exposed to flame or intense heat.

Reason: Purpose: To introduce new definition for Mastic and Intumescent Fire Resistant Coatings which are described in Section 1704.11.

Section 1704.11 provides requirements for Special Inspections for mastic and intumescent fire-resistant coatings applied to structural elements and decks, but the IBC does not contain any definition describing these materials.

Section 1704.11 requires Special inspections for mastic and intumescent fire-resistant coatings applied to structural elements and decks be in accordance with AWCI 12-B which is entitled "Field Applied Thin-Film Intumescent Fire-Resistive Materials". Special inspections are also required to be based on the fire-resistance design as designated in the approved construction documents. However, neither the IBC nor the AWCI 12-B Standard provides any description or definition for these materials. In order to ensure that the Special Inspection procedures are appropriate, some definitions of these materials should be incorporated into the IBC. This would bring these in line with Sprayed Fire Resistive Materials (SFRM).

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

This code change was heard by the IBC Fire Safety Code Development Committee.

Committee Action:

Approved as Submitted

Committee Reason: The committee agreed that definitions for mastic and intumescent fire resistant coatings were appropriate additions to the code because requirements for application and special inspection of these coatings are currently specified in Section 1704.11.

Assembly Action:

None

Final Hearing Results

S102-07/08

AS

Code Change No: S103-07/08

Original Proposal

Section: 1703.1.1

Proponent: D. Kirk Harman, P.E., S.E., The Harman Group, Inc., representing The NCSEA Code Advisory Committee, Quality Assurance and Special Inspection Subcommittee

Revise as follows:

1703.1 Approved agency. An approved agency shall provide all information as necessary for the building official to determine that the agency meets the applicable requirements.

1703.1.1 Independence. An approved agency shall be objective, ~~and competent~~ and independent from the contractor who's work is being inspected. The agency shall also disclose possible conflicts of interest so that objectivity can be confirmed.

Reason: This change is to clarify the term "Independent". NCSEA believes that for the Special Inspections process to have adequate integrity, it is important that special inspections not be performed by employees or consultants of the contractor. However, the Code should not be interpreted to require independence from the various design professionals who have undertaken design on the project. The Special Inspections are for assurance of quality of construction and conformance to design standards. They are in no way a check of the design. The proposed edits to the existing language in the code clarify these issues.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Modified

Modify proposal as follows:

1703.1.1 Independence. An approved agency shall be objective, competent and independent from the contractor responsible for the work ~~who's work is~~ being inspected. The agency shall also disclose possible conflicts of interest so that objectivity can be confirmed.

Committee Reason: This proposal elaborates on the requirement for an approved agency to be independent by adding that it is with respect to the contractor whose work is being inspected. The modification rewords this to make it clearer.

Assembly Action:

None

Final Hearing Results

S103-07/08

AM

Code Change No: S107-07/08

Original Proposal

Sections: 1704.1, 1704.1.2

Proponent: D. Kirk Harman, PE, SE, The Harman Group, Inc., representing The National Council of Structural Engineers (NCSEA) Code Advisory Committee Quality Assurance and Special Inspection Subcommittee

Revise as follows:

1704.1 (Supp) General. Where application is made for construction as described in this section, the owner or the registered design professional in responsible charge acting as the owner's agent shall employ one or more ~~special inspectors~~ approved agencies or provide special inspection services to ~~provide~~ perform inspections during construction on the types of work listed under Section 1704. These inspections are in addition to the inspections identified in Section 109.

The special inspector shall be a qualified person who shall demonstrate competence, to the satisfaction of the building official, for the inspection of the particular type of construction or operation requiring special inspection. The registered design professional in responsible charge and engineers of record involved in the design of the project are permitted to act as the approved agency and their personnel are permitted to inspect the work designed by them. The special inspector shall provide written documentation to the building official demonstrating their competence and relevant experience or training. Experience or training shall be considered relevant when the documented experience or training is related in complexity to the same type of special inspection activities for projects of similar complexity and material qualities. These qualifications are in addition to qualifications specified in other sections of this code.

Exceptions:

1. Special inspections are not required for work of a minor nature or as warranted by conditions in the jurisdiction as approved by the building official.
2. Special inspections are not required for building components unless the design involves the practice of professional engineering or architecture as defined by applicable state statutes and regulations governing the professional registration and certification of engineers or architects.
3. Unless otherwise required by the building official, special inspections are not required for occupancies in Group U that are accessory to a residential occupancy including, but not limited to, those listed in Section 312.1.

1704.1.2 Report requirement. Special inspectors shall keep records of inspections. The special inspector shall furnish inspection reports to the building official, and to the registered design professional in responsible charge. Reports shall indicate that work inspected was or was not completed ~~done~~ in conformance to approved construction documents. Discrepancies shall be brought to the immediate attention of the registered design professional in responsible charge and the contractor for correction. If the discrepancies are not corrected, the discrepancies shall

be brought to the attention of the building official and to the registered design professional in responsible charge prior to the completion of that phase of the work. A final report documenting required special inspections and correction of any discrepancies noted in the inspections shall be submitted at a point in time agreed upon prior to the start of work by the permit applicant and the building official ~~prior to the start of work~~.

Reason: NCSEA has received input from structural engineers in various locations throughout the United States stating that building officials sometimes take the position that the registered design professional in responsible charge and/or engineers of record responsible for design on a project are prohibited by the Code from performing Special Inspections. NCSEA believes that this is an incorrect interpretation of the Code. Special Inspections are a process to help assure conformance with design requirements and are not in any way intended to be a check of the design. This change is to clarify that the registered design professional and/or engineers of record involved in the design of the project may perform the special inspections.

NCSEA believes that Section 1704.1.2 does not clearly require reporting of incomplete work at all and does not require notification to the Registered Design Professional in Responsible Charge as to the outcome of Special Inspections. This change clarifies this in Section 1704.1.2.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Modified

Modify proposal as follows:

1704.1 (Supp) General. Where application is made for construction as described in this section, the owner or the registered design professional in responsible charge acting as the owner's agent shall employ one or more approved agencies ~~or provide special inspection services~~ to perform inspections during construction on the types of work listed under Section 1704. These inspections are in addition to the inspections identified in Section 109.

The special inspector shall be a qualified person who shall demonstrate competence, to the satisfaction of the building official, for the inspection of the particular type of construction or operation requiring special inspection. The registered design professional in responsible charge and engineers of record involved in the design of the project are permitted to act as the approved agency and their personnel are permitted to ~~inspect~~ act as the special inspector for the work designed by them, provided those personnel meet the qualification requirements of this section to the satisfaction of the building official. The special inspector shall provide written documentation to the building official demonstrating their competence and relevant experience or training. Experience or training shall be considered relevant when the documented experience or training is related in complexity to the same type of special inspection activities for projects of similar complexity and material qualities. These qualifications are in addition to qualifications specified in other sections of this code.

Exceptions:

1. Special inspections are not required for work of a minor nature or as warranted by conditions in the jurisdiction as approved by the building official.
2. Special inspections are not required for building components unless the design involves the practice of professional engineering or architecture as defined by applicable state statutes and regulations governing the professional registration and certification of engineers or architects.
3. Unless otherwise required by the building official, special inspections are not required for occupancies in Group U that are accessory to a residential occupancy including, but not limited to, those listed in Section 312.1.

1704.1.2 Report requirement. Special inspectors shall keep records of inspections. The special inspector shall furnish inspection reports to the building official, and to the registered design professional in responsible charge. Reports shall indicate that work inspected was or was not completed in conformance to approved construction documents. Discrepancies shall be brought to the immediate attention of the ~~registered design professional in responsible charge and the~~ contractor for correction. If the discrepancies are not corrected, the discrepancies shall be brought to the attention of the building official and to the registered design professional in responsible charge prior to the completion of that phase of the work. A final report documenting required special inspections and correction of any discrepancies noted in the inspections shall be submitted at a point in time agreed upon prior to the start of work by the permit applicant and the building official.

Committee Reason: This code change clarifies the code by stating that the registered design professional is permitted to do special inspections where they can demonstrate their qualifications to the satisfaction of the building official. The modification addresses some objections that were raised by clarifying that the registered design profession must demonstrate qualifications to the building official like any other potential special inspector. Special inspections still must be coordinated with the other inspections required by Section 109. It was noted that experience with permitting this in Hawaii has been positive.

Assembly Action:

None

Final Hearing Results

S107-07/08

AM

Code Change No: S109-07/08

Original Proposal

Section: 1704.2.2

Proponent: Bonnie Manley, American Iron and Steel Institute, representing American Institute of Steel Construction

Revise as follows:

1704.2.2 Fabricator approval. Special inspections required by ~~this code~~ Section 1704 are not required where the work is done on the premises of a fabricator registered and approved to perform such work without special inspection. Approval shall be based upon review of the fabricator's written procedural and quality control manuals and periodic auditing of fabrication practices by an approved special inspection agency. At completion of fabrication, the approved fabricator shall submit a certificate of compliance to the building official stating that the work was performed in accordance with the approved construction documents.

Reason: This modification attempts to clarify exactly which inspections are permitted to be waived when work is done by a registered and approved fabricator. As written now, it could be interpreted to mean that the special inspections for seismic resistance required by Section 1707.2 could be waived. This is not appropriate and needs to be corrected.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:**Approved as Submitted**

Committee Reason: This is a clarification that makes the applicability of special inspections to approved fabricators clearer.

Assembly Action:**None**

Final Hearing Results

S109-07/08**AS**

Code Change No: S110-07/08

Original Proposal

Sections: 1704.3, 1704.3.1.1 (New)

Proponent: Bonnie Manley, American Iron and Steel Institute

1. Revise as follows:

1704.3 Steel construction. The special inspections for steel elements of buildings and structures shall be as required by Section 1704.3 and Table 1704.3.

Exceptions:

1. Special inspection of the steel fabrication process shall not be required where the fabricator does not perform any welding, thermal cutting or heating operation of any kind as part of the fabrication process. In such cases, the fabricator shall be required to submit a detailed procedure for material control that

demonstrates the fabricator's ability to maintain suitable records and procedures such that, at any time during the fabrication process, the material specification, grade and mill test reports for the main stress-carrying elements are capable of being determined.

2. The special inspector need not be continuously present during welding of the following items, provided the materials, welding procedures and qualifications of welders are verified prior to the start of the work; periodic inspections are made of the work in progress; and a visual inspection of all welds is made prior to completion or prior to shipment of shop welding.
 - 2.1. Single-pass fillet welds not exceeding 5/16 inch (7.9 mm) in size.
 - 2.2. Floor and roof deck welding.
 - 2.3. Welded studs when used for structural diaphragm.
 - 2.4. Welded sheet steel for cold-formed steel light frame construction framing members ~~such as studs and joists.~~
 - 2.5. Welding of stairs and railing systems.

2. Add new text as follows:

1704.3.1.1 Cold-formed steel. Welding inspection and welding inspector qualification for cold-formed steel, including metal floor and roof decks, shall be in accordance with AWS D1.3.

Reason: IBC Section 1704.3, Exception 2.4 was corrected to match the terminology used in IBC Section 2210. IBC Section 1704.3.1 on welding currently only references AWS D1.1. Since "Steel Construction" covers steel other than just structural steel, referencing AWS D1.1 alone is not sufficient. AWS D1.3 covers cold-formed steel and is added as a new subsection. Please see companion change which moves the reference to AWS D1.1 into a new subsection for "Structural Steel'."

Cost Impact: This code change will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Modified

Modify proposal as follows:

1704.3 Steel construction. The special inspections for steel elements of buildings and structures shall be as required by Section 1704.3 and Table 1704.3.

Exceptions:

1. Special inspection of the steel fabrication process shall not be required where the fabricator does not perform any welding, thermal cutting or heating operation of any kind as part of the fabrication process. In such cases, the fabricator shall be required to submit a detailed procedure for material control that demonstrates the fabricator's ability to maintain suitable records and procedures such that, at any time during the fabrication process, the material specification, grade and mill test reports for the main stress-carrying elements are capable of being determined.
2. The special inspector need not be continuously present during welding of the following items, provided the materials, welding procedures and qualifications of welders are verified prior to the start of the work; periodic inspections are made of the work in progress; and a visual inspection of all welds is made prior to completion or prior to shipment of shop welding.
 - 2.1. Single-pass fillet welds not exceeding 5/16 inch (7.9 mm) in size.
 - 2.2. Floor and roof deck welding.
 - 2.3. Welded studs when used for structural diaphragm.
 - 2.4. Welded sheet steel for cold-formed steel ~~light frame construction~~ members.
 - 2.5. Welding of stairs and railing systems.

1704.3.1.1 Cold-formed steel. Welding inspection and welding inspector qualification for cold-formed steel, ~~including metal floor and roof decks,~~ shall be in accordance with AWS D1.3.

Committee Reason: This code change makes an important clarification for cold-formed steel. AWS D 1.3 is the appropriate reference standard for welding of cold formed steel. The modification is an editorial correction to make the scope of the reference clearer and consistent with the current extent of special inspections.

Assembly Action:

None

Final Hearing Results

S110-07/08

AM

Code Change No: **S111-07/08**

Original Proposal

Sections: 1704.3.1, 1704.3.1.1 (New), 1704.3.3

Proponent: Bonnie Manley, American Iron and Steel Institute, representing American Institute of Steel Construction

Revise as follows:

1704.3.1 Welding. Welding inspection ~~shall be in compliance with AWS D1.1. The basis for~~ and welding inspector qualification shall be in accordance with this section ~~AWS D1.1.~~

1704.3.1.1 Structural steel. Welding inspection and welding inspector qualification for structural steel shall be in accordance with AWS D1.1.

1704.3.3 High-strength bolts. Installation of high-strength bolts shall be ~~periodically~~ inspected in accordance with AISC specifications 360.

Reason: IBC Section 1704.3.1 on welding currently only references AWS D1.1, which specifically applies to structural steel members. This change clarifies the code.

The modification to Section 1704.3.3 is intended to correct and clarify the code. The term 'periodically' is recommended for deletion because 1704.3.3.3 requires continuous inspection for the two methods of installation. Also, the appropriate reference document for this section is AISC 360, Specification for Structural Steel Buildings.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Modified

Modify proposal by adding new item as follows:

1704.3.1.3 Reinforcing steel. Welding inspection and welding inspector qualification for reinforcing steel shall be in accordance with AWS D1.4 and ACI 318.

(Portions of proposal not shown remain unchanged)

Committee Reason: This code change clarifies the applicable reference standard for welding and bolting of structural steel. The modification adds a new section to provide appropriate guidance on welding inspections for reinforcing steel.

Assembly Action:

None

Final Hearing Results

S111-07/08

AM

Code Change No: **S112-07/08**

Original Proposal

Table 1704.3

Proponent: Bonnie Manley, American Iron and Steel Institute, representing American Institute of Steel Construction

Revise table as follows:

TABLE 1704.3

REQUIRED VERIFICATION AND INSPECTION OF STEEL CONSTRUCTION

VERIFICATION AND INSPECTION	CONTINUOUS	PERIODIC	REFERENCED STANDARD ^a	IBC REFERENCE
1. Material verification of high-strength bolts, nuts and washers:				
a. Identification markings to conform to ASTM standards specified in the approved construction documents.	—	X	Applicable ASTM material specifications: AISC 360, Section A3.3 and applicable ASTM material standards	—
b. Manufacturer's certificate of compliance required	—	X	—	—
2. Inspection of high-strength bolting:				
a. Bearing type connections. Snug-tight joints.	—	X	AISC 360, Section M2.5	1704.3.3
b. Pretensioned and slip- Slip-critical joints using turn-of-nut with matchmarking, twist-off bolt, or direct tension indicator methods of installation. connections.	X =	X		
c. <u>Pretensioned and slip-critical joints using turn-of-nut without matchmarking or calibrated wrench methods of installation.</u>	X	=		
3. Material verification of structural steel:				
a. <u>For structural steel, identification markings to conform to AISC 360</u>	=	X	AISC 360, Section M5.5	
a. b. For other steel, identification markings to conform to ASTM standards specified in the approved construction documents.	—	— X	ASTM A 6 or ASTM A 568 Applicable ASTM material standards	4708.4
b. c. Manufacturer's certified mill test reports.	—	— X	ASTM A6 or ASTM A568	4708.4
4. Material verification of weld filler materials:				
a. Identification markings to conform to AWS specification in the approved construction documents.	—	— X	AISC 360, Section A3.5 and <u>Applicable AWS A5 documents</u>	—
b. Manufacturer's certificate of compliance required.	—	— X	—	—
5. Inspection of welding:				
a. Structural Steel:				
1) Complete and partial joint penetration groove welds.	X	—	AWS D1.1	1704.3.1
2) Multipass fillet welds	X	—		
3) Single-pass fillet welds > 5/16"	X	—		
4) <u>Plug and slot welds</u>	X	=		
4) 5) Single-pass fillet welds ≤ 5/16"	—	X		
5) 6) Floor and roof deck welds.	—	X	AWS D1.3	
b. Reinforcing steel:				
1) Verification of weldability of	—	X	AWS D1.4 ACI 318; 3.5.2 AWS D1.4 or ACI 318:	—

VERIFICATION AND INSPECTION	CONTINUOUS	PERIODIC	REFERENCED STANDARD ^a	IBC REFERENCE
reinforcing steel other than ASTM A706			Section 3.5.2	
2) Reinforcing steel-resisting flexural and axial forces in intermediate and special moment frames, and boundary elements of special reinforced concrete shear walls and shear reinforcement.	X	—		
3) Shear reinforcement.	X	—		
4) Other reinforcing steel	—	X		
6. Inspection of steel frame joint details for compliance with approved construction documents:		X		1704.3.2
a. Details such as bracing and stiffening.	—	— X	—	1704.3.2
b. Member locations.	—	— X		
c. Application of joint details at each connection.	—	X		

For SI: 1 inch = 25.4 mm.

a. Where applicable, see also Section 1707.1, Special inspection for seismic resistance.

Reason: Modifications to Item #1: The modification in Item #1a clarifies the relationship between the referenced standards and rearranges them for better flow.

Modifications to Item #2a: This modification corrects the terminology from 'bearing-type connections' to 'snug-tight joints.'

Modifications to Item #2b and the addition of Item #2c: These modifications update the terminology used and distinguish between snug tight joints, and pretensioned and slip-critical joints using matchmarked turn-of-nut, twist-off bolt, or direct tension indicator methods of installation, which require periodic inspection in the text of 1704.3.3.2, and pretensioned and slip-critical joints using non-matchmarked turn-of-nut or calibrated wrench methods of installation, which require continuous inspection in 1704.3.3.3

Modifications to Item #3: The modification to Item #3 clarifies the application of this item and eliminates potential confusion with the use of the existing term "structural steel member," which includes only rolled steel structural shapes. Also, reference to the specific ASTM standards has been changed to the more generalized "applicable ASTM material standards" to match the verbiage in Table 1704, Item #1. Additionally, the modifications to Items #3a, 3b and 3c clarify that periodic inspection is required. AISC 360 and the applicable ASTM standards do not necessarily address the frequency of inspection of material identification using the terms "periodic" or "continuous". Instead, the proposal to do material identification on a periodic basis brings it into agreement with bolt material inspection (Items #1a and 1b) and rebar weldability (Item #5b1), also in Table 1704.4 Items #1 and 4, Table 1704.5.1 Item #1a, and Table 1704.5.3 Item #1a. Finally, the reference to Section 1708.4 is not appropriate and has been deleted.

Modifications to Item #4: The modifications to Items #4a and 4b clarify that periodic inspection is required. AISC 360 and the AWS A5 documents do not necessarily address the frequency of inspection of material identification using the terms "periodic" or "continuous". Instead, the proposal to do material identification on a periodic basis brings it into agreement with bolt material inspection (Items #1a and 1b) and rebar weldability (Item #5b1), also in Table 1704.4 Items #1 and 4, Table 1704.5.1 Item #1a, and Table 1704.5.3 Item #1a.

Modification to Item #5a and #5a(1): These modifications correct the terminology.

Addition of new Item #5a(4): The current table is missing an entry for plug and slot welds. The plug and slot weld provision is proposed to be included as continuous because it is not specifically listed as qualifying for periodic inspection in 1704.3.2.

Modification to Item #5b: This change is editorial. In keeping with the style of the table, the applicable referenced standards for Items #5b(1) and 5b (2) have been relocated to the cell below, which has been merged between #5b(1) and 5b (2). In addition, the relationship between the two referenced standards has been clarified.

Modification to Item #6: This change is editorial. In keeping with the style of the table, the IBC reference for Items #6 has been relocated to the cell below, which has been merged between #6a, 6b, and 6c.

Modifications to Item #6a, b, and c: The modifications to Items #6a, 6b and 6c clarify that periodic inspection is required by the IBC reference, Section 1704.3.2.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Modified

CODE CHANGES RESOURCE COLLECTION – INTERNATIONAL BUILDING CODE

Modify proposal as follows:

TABLE 1704.3 REQUIRED VERIFICATION AND INSPECTION OF STEEL CONSTRUCTION				
VERIFICATION AND INSPECTION	CONTINUOUS	PERIODIC	REFERENCED STANDARD ^a	IBC REFERENCE
1. Material verification of high-strength bolts, nuts and washers:				
a. Identification markings to conform to ASTM standards specified in the approved construction documents.	—	X	AISC 360, Section A3.3 and applicable ASTM material standards	—
b. Manufacturer's certificate of compliance required	—	X	—	—
2. Inspection of high-strength bolting:				
a. Snug-tight joints.	—	X		
b. Pretensioned and slip-critical joints using turn-of-nut with matchmarking, twist-off bolt, or direct tension indicator methods of installation.	—	X	AISC 360, Section M2.5	1704.3.3
c. Pretensioned and slip-critical joints using turn-of-nut without matchmarking or calibrated wrench methods of installation.	X	—		
3. Material verification of <u>structural steel and cold-formed steel deck</u> :				
a. For structural steel, identification markings to conform to AISC 360	—	X	AISC 360, Section M5.5	
b. For other steel, identification markings to conform to ASTM standards specified in the approved construction documents.	—	X	Applicable ASTM material standards	
c. Manufacturer's certified mill test reports.	—	X		
4. Material verification of weld filler materials:				
a. Identification markings to conform to AWS specification in the approved construction documents.	—	X	AISC 360, Section A3.5 and Applicable AWS A5 documents	—
b. Manufacturer's certificate of compliance required.	—	X	—	—
5. Inspection of welding:				
a. <u>Structural steel and cold-formed steel deck</u> :				
1) Complete and partial joint penetration groove welds.	X	—	AWS D1.1	1704.3.1
2) Multipass fillet welds	X	—		
3) Single-pass fillet welds > 5/16"	X	—		
4) Plug and slot welds	X	—		
5) Single-pass fillet welds ≤ 5/16"	—	X		
6) Floor and roof deck welds.	—	X	AWS D1.3	
b. Reinforcing steel:				
1) Verification of weldability of reinforcing steel other than ASTM A706	—	X	AWS D1.4 or ACI 318: Section 3.5.2	—
2) Reinforcing steel-resisting flexural and axial forces in intermediate and special moment frames, and boundary elements of special reinforced concrete shear walls and shear reinforcement.	X	—		
3) Shear reinforcement.	X	—		
4) Other reinforcing steel	—	X		
6. Inspection of steel frame joint details for compliance with approved construction documents:				
a. Details such as bracing and stiffening.	—	X	—	1704.3.2
b. Member locations.	—	X		
c. Application of joint details at each connection.	—	X		

Committee Reason: This proposal revises the table for inspection of steel construction to include appropriate nomenclature, making the table more user friendly. Requirements for slip-critical bolts are made clearer. The modification provides clarification that limits the inspection of cold-formed steel to floor and roof decks.

Assembly Action:

None

Final Hearing Results

S112-07/08

AM

Code Change No: S115-07/08

Original Proposal

Sections: 1704.3.4 (New), 1704.6.2 (New)

Proponent: Edwin Huston, National Council of Structural Engineers Association (NCSEA), representing NCSEA Code Advisory Committee – General Engineering Subcommittee

Add new text as follows:

1704.3.4 Cold-formed steel trusses spanning 60 feet or greater. Where a cold formed steel truss clear span is 60 feet (18288mm) or greater, the special inspector shall verify that the temporary installation restraint/bracing and the permanent individual truss member restraint/bracing are installed in accordance with the approved truss submittal package.

1704.6.2 Metal-plate connected wood trusses spanning 60 feet or greater. Where a truss clear span is 60 feet (18288 mm) or greater, the special inspector shall verify that the temporary installation restraint/bracing and the permanent individual truss member restraint/bracing are installed in accordance with the approved permit drawings.

Reason: This language is needed in order coordinate with Section 2210.3 (Cold Formed Steel Trusses) and Section 2303.4. (Wood Trusses) for criteria needed for long span truss conditions.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Modified

Modify proposal as follows:

1704.3.4 Cold-formed steel trusses spanning 60 feet or greater. Where a cold formed steel truss clear span is 60 feet (18288mm) or greater, the special inspector shall verify that the temporary installation restraint/bracing and the permanent individual truss member restraint/bracing are installed in accordance with the approved truss submittal package.

1704.6.2 Metal-plate connected wood trusses spanning 60 feet or greater. Where a truss clear span is 60 feet (18288 mm) or greater, the special inspector shall verify that the temporary installation restraint/bracing and the permanent individual truss member restraint/bracing are installed in accordance with the approved ~~permit drawings~~ truss submittal package.

Committee Reason: This proposal adds special inspections for long span trusses that should be spelled out in the code. The modification makes an editorial change under the section for wood trusses to make the wording consistent with other code sections.

Assembly Action:

None

Final Hearing Results

S115-07/08

AM

Code Change No: **S117-07/08**

Original Proposal

Table 1704.4, Section 1912.2 (New)

Proponent: Randall Shackelford, P.E., Simpson Strong-Tie, Co., Inc. representing himself

1. Revise table as follows:

**TABLE 1704.4
REQUIRED VERIFICATION AND INSPECTION OF CONCRETE CONSTRUCTION**

VERIFICATION AND INSPECTION	CONTINUOUS	PERIODIC	REFERENCED STANDARD ^a	IBC REFERENCE
3. <u>Where allowable loads have been increased or design strengths have not been decreased, inspect headed bolts, headed studs, and hooked bolts to be installed in concrete prior to and during placement of concrete where allowable loads have been increased and inspect expansion and undercut anchors during installation in hardened concrete.</u>	X	—	<u>ACI 318: Appendix D</u>	1911.5, 1912.2

(Portions of table not shown remain unchanged)

2. Add new text as follows:

1912.2 Strength reduction for no special inspection. Where special inspection is not provided for the installation of anchors designed in accordance with this section, a 50-percent decrease in the tension design strength shall be taken. No decrease in shear design strength is required.

Reason: The purposes of the proposed code changes are to:

- 1) Utilize consistent language when referring to anchors, bolts, studs, etc between Table 1704.4 and IBC Sections 1911.1 and 1912.1.
- 2) Clarify that design strengths calculated under IBC Section 1912 presume that special inspection is provided.
- 3) Allow the design professional to eliminate the special inspection requirement provided that the design tension strengths calculated under IBC Section 1912 are decreased by 50 percent.

Justification (Reference the numbers above):

- 1) Use of inconsistent names for anchors between the code sections causes confusion and can lead users of the code to believe that some types of cast-in-place and post-installed anchors require special inspection while other types do not. The intent of the code is that the requirements for special inspection apply uniformly to all types of cast in place anchors and post-installed anchors, regardless of name.
- 2) The design strengths calculated under IBC Section 1912 (i.e. ACI 318 Appendix D) are based on the 5% fracture strengths of cast-in-place and post-installed anchors in concrete from research, theory, and testing. Unlike anchors in IBC Section 1911, no reductions have been pre-applied to the design strengths calculated in accordance with ACI 318 Appendix D to account for the removal of special inspection.
- 3) IBC Section 1911.5 allows design professionals the option of requiring or not requiring special inspection for anchors. If special inspection is not provided, the allowable tension load for anchors designed under Section 1911 is effectively reduced by 50 percent. The proposal permits design professionals to similarly eliminate the requirement for special inspection for anchors designed under Section 1912 by reducing design strength by 50 percent.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: With the testimony on this proposal as well as S116-07/08, it was obvious that there are unresolved issues and no consensus on just how to incorporate the needed inspections of concrete anchors at this time. The addition of special inspections for drilled-in anchors has merit, but the requirements are not yet clear enough.

Assembly Action:

None

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

John Silva, Hilti North America, representing himself, requests Approval as Modified by this public comment.

Modify proposal as follows:

**TABLE 1704.4
REQUIRED VERIFICATION AND INSPECTION OF CONCRETE CONSTRUCTION**

VERIFICATION AND INSPECTION	CONTINUOUS	PERIODIC	REFERENCED STANDARDS	IBC REFERENCE
3. Where allowable loads have been increased or design strengths have not been decreased, inspection of headed bolts, headed studs, and hooked bolts to be installed in concrete prior to and during placement of concrete where allowable loads have been increased and inspect expansion and undercut anchors during installation in hardened concrete, or where strength design is used.	X	–	ACI 318 8.1.3, 21.2.8 Appendix D	1911.5, 1912.1 4912.2
4. Inspection of anchors installed in hardened concrete		X	ACI 318: 3.8.6, 8.1.3, 21.2.8	1912.1

(Portions of table not shown remain unchanged)

~~**1912.2 Strength reduction for no special inspection.** Where special inspection is not provided for the installation of anchors designed in accordance with this section, a 50-percent decrease in the tension design strength shall be taken. No decrease in shear design strength is required.~~

Commenter's Reason: Currently, Table 1704.4 does not require special inspection for the following cases:

- Bolts designed in accordance with the strength design procedures of ACI 318 Appendix D;
- Anchors installed in hardened concrete (e.g., expansion and undercut anchors); and
- All bolts and anchors designed to resist seismic loads.

While the ICC-ES Evaluation Service currently issues Evaluation Service Reports for expansion and undercut anchors with the requirement that continuous special inspection be provided in all cases, this is not explicitly supported by the code. The ICC-ES position is based on the global safety factor associated with anchor designs under Appendix D and on Section 1704.13; note however, that Section 1704.13 does not specify the type of special inspection, periodic or continuous, that is required. The imposition of continuous special inspection has created hardship for projects involving the installation of large numbers of anchors, whereby the simultaneous inspection of all installations is impractical and unwarranted. The omission of inspection requirements in Table 1704.4 for bolts designed in accordance with Appendix D (and, therefore, for all bolts and anchors designed to resist seismic loads) is simply in error.

S117-07/08 attempted to redress this situation by restoring the inspection requirements traditionally associated with the use of post-installed anchors under the allowable stress design rules (i.e., no special inspection for 50% tension resistance). This approach was rejected by the committee.

The proposal provided in this public comment adds "anchors installed in hardened concrete" as a new line item in Table 1704.4 and simultaneously clarifies the inspection requirements for CIP bolts ("bolts to be installed in concrete prior to and during placement of concrete") by adding "or where strength design is used" with the appropriate standard and section references. The inspection requirement for anchors installed in hardened concrete is given as "periodic". This reflects the usual manner in which anchor installations are treated in the inspection process and is also in conformance with Sections 1707.6, 1707.7 and 1707.8 for inspection of anchorage of architectural and mechanical components where seismic resistance is required.

This proposal is endorsed by the Concrete Anchor Manufacturers' Association and by the Rack Manufacturers Institute.

Final Hearing Results

S117-07/08

AMPC

Code Change No: S118-07/08

Original Proposal

Sections: 1704.5, Table 1704.5.1, Table 1704.5.3, 1708.1 through Table 1708.1.4

Proponent: Jason Thompson, Concrete Masonry Association, representing Masonry Alliance for Codes and Standards

1. Revise as follows:

1704.5 Masonry construction. Masonry construction shall be inspected and ~~evaluated~~ verified in accordance with the requirements of Sections 1704.5.1 through 1704.5.3, depending on the classification of the building or structure or nature of the occupancy, as defined by this code.

Exception: Special inspections shall not be required for:

1. Empirically designed masonry, glass unit masonry or masonry veneer designed by Section 2109, 2110 or Chapter 14, respectively, or by Chapter 5, 7 or 6 of ACI 530/ASCE 5/TMS 402, respectively, when they are part of structures classified as Occupancy Category I, II or III in accordance with Section 1604.5.
2. Masonry foundation walls constructed in accordance with Table 1805.5(1), 1805.5(2), 1805.5(3) or 1805.5(4).
3. Masonry fireplaces, masonry heaters or masonry chimneys installed or constructed in accordance with Section 2111, 2112 or 2113, respectively.

**TABLE 1704.5.1
LEVEL 1 SPECIAL INSPECTION
LEVEL 1 REQUIRED VERIFICATION AND INSPECTION OF MASONRY CONSTRUCTION**

<u>VERIFICATION AND INSPECTION TASK</u>	<u>FREQUENCY OF INSPECTION</u>		<u>REFERENCE FOR CRITERIA</u>		
	<u>Continuous during task listed</u> CONTINUOUS	<u>Periodically during task listed</u> PERIODIC	<u>IBC Section</u> SECTION	<u>ACI 530/ASCE 5/TMS 402^a</u>	<u>ACI 530.1/ASCE 6/TMS 602^a</u>
1. <u>Verify compliance with the approved submittals</u>	=	X	=	=	<u>Art. 1.5</u>
2. <u>Verification of f'_m and f'_{AAC} prior to construction except where specifically exempted by this code</u>	=	X	=	=	<u>Art. 1.4B</u>
3. <u>Verification of slump flow and VSI as delivered to the site for self-consolidating grout</u>	X	=	=	=	<u>Art 1.5B.1.b.3</u>
44. <u>As masonry construction begins, the following shall be verified to ensure compliance:</u>					
a. <u>Proportions of site-prepared mortar.</u>	—	X	—	—	Art. 2.6A
b. <u>Construction of mortar joints.</u>	—	X	—	—	Art. 3.3B
c. <u>Location of reinforcement, connectors, prestressing tendons and anchorages.</u>	—	X	—	—	Art. 3.4, 3.6A
d. <u>Prestressing technique.</u>	—	X	—	—	Art. 3.6B
e. <u>Grade and size of prestressing tendons and anchorages.</u>	—	X	—	—	Art. 2.4B, 2.4H
25. <u>The During construction the inspection</u>					

VERIFICATION AND INSPECTION TASK	FREQUENCY OF INSPECTION		REFERENCE FOR CRITERIA		
	Continuous during task listed <u>CONTINUOUS</u>	Periodically during task listed <u>PERIODIC</u>	IBC Section <u>SECTION</u>	ACI 530/ASCE 5/TMS 402 ^a	ACI 530.1/ASCE 6/TMS 602 ^a
program shall verify:					
a. Size and location of structural elements.	—	X	—	—	Art. 3.3G
b. Type, size and location of anchors, including other details of anchorage of masonry to structural members, frames or other construction.	—	X	—	Sec. 1.2.2(e), 2.1.4, 3.1.6	—
c. Specified size, grade and type of reinforcement, <u>anchor bolts, prestressing tendons and anchorages.</u>	—	X	—	Sec. 1.13	Art. 2.4, 3.4
d. Welding of reinforcing bars	X	—	—	Sec. 2.1.10.7.2, 3.3.3.4(b)	—
e. <u>Preparation, construction and protection</u> of masonry during cold weather (temperature below 40°F) or hot weather (temperature above 90°F).	—	X	Sec 2104.3, 2104.4	—	Art. 1.8C, 1.8D
f. Application and measurement of prestressing force.	<u>X</u> —	<u>—</u> X	—	—	Art. 3.6B
36. Prior to grouting, the following shall be verified to ensure compliance:					
a. Grout space is clean	—	X	—	—	Art. 3.2D
b. Placement of reinforcement and connectors, and prestressing tendons and anchorages.	—	X	—	Sec. 1.13	Art. 3.4
c. Proportions of site-prepared grout and prestressing grout for bonded tendons.	—	X	—	—	Art. 2.6B
d. Construction of mortar joints.	—	X	—	—	Art. 3.3B
47. Grout placement shall be verified to ensure compliance with code and construction document provisions.	X	—	—	—	Art 3.5
a. Grouting of prestressing bonded tendons.	X	—	—	—	Art. 3.6C
58. Preparation of any required grout specimens, mortar specimens and/or prisms shall be observed.	<u>—</u> X	<u>X</u> —	Sec. 2105.2.2, 2105.3	—	Art. 1.4
6. Compliance with required inspection provisions of the construction documents and the approved submittals shall be verified	—	X	—	—	Art. 1.5

For SI: °C = (°F - 32)/1.8.

a. The specific standards referenced are those listed in Chapter 35.

**TABLE 1704.5.32
LEVEL 2 SPECIAL INSPECTION
LEVEL 2 REQUIRED VERIFICATION AND INSPECTION OF MASONRY CONSTRUCTION**

VERIFICATION AND INSPECTION TASK	Continuous during task listed CONTINUOUS	Periodically during task listed PERIODIC	REFERENCE FOR CRITERIA		
			IBC section SECTION	TMS 402/ACI 530/ ASCE 5 ^a	TMS 602/ACI 530.1/ ASCE 6 ^a
1. Verify compliance with the approved submittals	=	X	=	=	Art. 1.5
2. Verification of f'_m and f'_{AAC} prior to construction and for every 5000 sq.ft. during construction.	=	X	=	=	Art. 1.4B
3. Verification of proportions of materials in premixed or preblended mortar and grout as delivered to the site.	=	X	=	=	Art. 1.5B
4 Verification of slump flow and VSI as delivered to the site for self-consolidating grout	X	=	=	=	Art. 1.5B.1.b.3
15 From the beginning of masonry construction, the The following shall be verified to ensure compliance:					
a. Proportions of site-prepared mortar, grout and prestressing grout for bonded tendons.	—	X	—	—	Art. 2.6A
b. Placement of masonry units and construction of mortar joints.	—	X	—	—	Art.
c. Placement of reinforcement, connectors and prestressing tendons and anchorages.	X—	=X	—	Sec. 1.13	Art. 3.4, 3.6A
d. Grout space prior to grouting.	X	—	—	—	Art. 3.2D
e. Placement of grout.	X	—	—	—	Art. 3.5
f. Placement of prestressing grout.	X	—	—	—	Art. 3.6C
2. The inspection program shall verify:					
ag. Size and location of structural elements	—	X	—	—	Art. 3.3G
bh. Type, size and location of anchors, including other details of anchorage of masonry to structural members, frames or other construction.	X	—	—	Sec. 1.2.2(e), 2.1.4, 3.1.6	—
ej. Specified size, grade and type of reinforcement, anchor bolts, prestressing tendons and anchorages.	—	X	—	Sec. 1.13	Art. 2.4, 3.4
dj. Welding of reinforcing bars.	X	—	—	Sec. 2.1.10.7.2, 3.3.3.4(b)	—
ek. Preparation, construction and protection of masonry during cold weather (temperature below 40°F) or hot weather (temperature above 90°F).	—	X	Sec 2104.3, 2104.4	—	Art. 1.8C, 1.8D
fl. Application and measurement of prestressing force.	X	—	—	—	Art. 3.6B

VERIFICATION AND INSPECTION TASK	Continuous during task listed <u>CONTINUOUS</u>	Periodically during task listed <u>PERIODIC</u>	REFERENCE FOR CRITERIA		
			IBC section <u>SECTION</u>	TMS <u>402/ACI</u> <u>530/ASCE</u> <u>5^a</u>	TMS <u>602/ACI</u> <u>530.1/ASCE</u> <u>6^a</u>
36 Preparation of any required grout specimens, mortar specimens and/or prisms shall be observed.	X	—	Sec. 2105.2.2, 2105.3	—	Art. 1.4
4. Compliance with required inspection provisions of the construction documents and the approved submittals shall be verified	—	X	—	—	Art. 1.5

For SI: °C = (°F - 32)/1.8.

a. The specific standards referenced are those listed in Chapter 35.

2. Delete without substitution as follows:

1708.1 (Supp) Special inspections for wind requirements. Special inspections itemized in Sections 1708.2 through 1708.4, unless exempted by the exceptions to Section 1704.1, are required for buildings and structures constructed in the following areas:

1. In wind Exposure Category B, where the 3-second-gust basic wind speed is 120 miles per hour (52.8 m/se) or greater.
2. In wind Exposure Categories C or D, where the 3-second-gust basic wind speed is 110 mph (49 m/se) or greater.

1708.1.1 Empirically designed masonry and glass unit masonry in Occupancy Category I, II or III. For masonry designed by Section 2109 or 2110 or by Chapter 5 or 7 of ACI 530/ASCE 5/TMS 402 in structures classified as Occupancy Category I, II or III, in accordance with Section 1604.5, certificates of compliance used in masonry construction shall be verified prior to construction.

1708.1.2 Empirically designed masonry and glass unit masonry in Occupancy Category IV. The minimum testing and verification prior to construction for masonry designed by Section 2109 or 2110 or by Chapter 5 or 7 of ACI 530/ASCE 5/TMS 402 in structures classified as Occupancy Category IV, in accordance with Section 1604.5, shall comply with the requirements of Table 1708.1.2.

**TABLE 1708.1.2
LEVEL 1 QUALITY ASSURANCE
MINIMUM TESTS AND SUBMITTALS**

Certificates of compliance used in masonry construction.

Verification of f_m and f_{AAC} prior to construction, except where specifically exempted by this code.

1708.1.3 Engineered masonry in Occupancy Category I, II or III. The minimum testing and verification prior to construction for masonry designed by Section 2107 or 2108 or by chapters other than Chapter 5, 6 or 7 of ACI 530/ASCE 5/TMS 402 in structures classified as Occupancy Category I, II or III, in accordance with Section 1604.5, shall comply with Table 1708.1.2.

1708.1.4 Engineered masonry in Occupancy Category IV. The minimum testing and verification prior to construction for masonry designed by Section 2107 or 2108 or by chapters other than Chapter 5, 6 or 7 of ACI 530/ASCE 5/TMS 402 in structures classified as Occupancy Category IV, in accordance with Section 1604.5, shall comply with Table 1708.1.4.

**TABLE 1708.1.4
LEVEL 2 QUALITY ASSURANCE
MINIMUM TESTS AND SUBMITTALS**

Certificates of compliance used in masonry construction.

Verification of f_m and f_{AAC} prior to construction and every 5,000 square feet during construction.

Verification of proportions of materials in mortar and grout as delivered to the site.

(Renumber subsequent sections)

CODE CHANGES RESOURCE COLLECTION – INTERNATIONAL BUILDING CODE

Reason: The revisions proposed in this code change reflect editorial and substantive revisions incorporated into the 2008 edition of the Building Code Requirements for Masonry Structures (TMS 402/ACI 530/ASCE 5), commonly referred to as the Masonry Standard Joint Committee (MSJC) Code. This code change proposal is one of several to harmonize the design and construction requirements for masonry within the IBC with those in the reference standard. A complete list of revisions incorporated into the reference standard is available for download at www.masonrystandards.org.

Specific revisions proposed above include:

IBC Section T1704.5.1 and 1704.5.3 have been revised to comply with the changes in the 2008 MSJC and to conform to the format of the tables for steel and concrete. In Section 1708 we are proposing to delete the Seismic Testing Provisions for masonry. 1708 doesn't indicate which SDC's require these tests. As such they are required in any SDC and are routinely performed in all SDC's. This has caused significant confusion to many practitioners who don't know when to require this testing. They think it is only required in zones of moderate or high seismicity. Moving these requirements to T1704.5.1 and 1704.5.3 allows them to be eliminated from 1708 and follows the model of concrete.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Errata: Revise first deleted section under item 2 to read as follows:

~~1708.1 Masonry. Testing and verification of masonry materials and assemblies prior to construction shall comply with the requirements of Sections 1708.1.1 through 1708.1.4, depending on the classification of the building or structure or nature of the occupancy, as defined by this code.~~

Committee Action:

Approved as Modified

Modify proposal as follows:

1704.5 Masonry construction. Masonry construction shall be inspected and verified in accordance with the requirements of Sections 1704.5.1 through 1704.5.3, depending on the classification of the building or structure or nature of the occupancy, as defined by this code.

Exception: Special inspections shall not be required for:

1. Empirically designed masonry, glass unit masonry or masonry veneer designed by Section 2109, 2110 or Chapter 14, respectively, or by Chapter 5, 7 or 6 of ACI 530/ASCE 5/TMS 402, respectively, when they are part of structures classified as Occupancy Category I, II or III in accordance with Section 1604.5.
2. Masonry foundation walls constructed in accordance with Table 1805.5(1), 1805.5(2), 1805.5(3) or 1805.5(4).
3. Masonry fireplaces, masonry heaters or masonry chimneys installed or constructed in accordance with Section 2111, 2112 or 2113, respectively.

**TABLE 1704.5.1
LEVEL 1 REQUIRED VERIFICATION AND INSPECTION OF MASONRY CONSTRUCTION
FREQUENCY OF INSPECTION REFERENCE FOR CRITERIA**

VERIFICATION AND INSPECTION	CONTINUOUS	PERIODIC	IBC SECTION	ACI 530/ASCE 5/TMS 402 ^a	ACI 530.1/ASCE 6/TMS 602 ^a
1. <u>Compliance with required inspection provisions of the construction documents and the approved submittals shall be verified. Verify compliance with the approved submittals</u>	—	X	—	—	Art. 1.5

**TABLE 1704.5.2
LEVEL 2 REQUIRED VERIFICATION AND INSPECTION OF MASONRY CONSTRUCTION**

VERIFICATION AND INSPECTION	CONTINUOUS	PERIODIC	REFERENCE FOR CRITERIA		
			IBC SECTION	TMS 402/ACI 530/ ASCE 5 ^a	TMS 602/ACI 530.1/ ASCE 6 ^a
1. <u>Compliance with required inspection provisions of the construction documents and the approved submittals. Verify compliance with the approved submittals</u>	—	X	—	—	Art. 1.5
5 The following shall be verified to ensure compliance:					
a. Proportions of site-prepared mortar, grout and prestressing grout for bonded tendons.	—	X	—	—	Art. 2.6A

VERIFICATION AND INSPECTION	CONTINUOUS	PERIODIC	REFERENCE FOR CRITERIA		
			IBC SECTION	TMS 402/ACI 530/ASCE 5 ^a	TMS 602/ACI 530.1/ ASCE 6 ^a
b. Placement of masonry units and construction of mortar joints.	—	X	—	—	Art. 3.3B
c. Placement of reinforcement, connectors and prestressing tendons and anchorages.	×	X	—	Sec. 1.13	Art. 3.4, 3.6A

(Portions of proposal not shown do not change)

Committee Reason: This code change brings the IBC requirements for masonry inspections into better alignment with the referenced standards for masonry construction. The modification retains the current requirement for periodic inspection of placement of reinforcement, connectors and prestressing tendons and anchorages. It also makes appropriate wording changes for the purpose of consistency.

Assembly Action:

None

Final Hearing Results

S118-07/08

AM

Code Change No: **S121-07/08**

Original Proposal

Sections: 1704.7, 1704.8, 1704.9

Proponent: Philip Brazil, PE, SE, Reid Middleton, Inc., representing himself

Revise as follows:

1704.7 (Supp) Soils. Special inspections for existing site soil conditions, fill placement and load-bearing requirements shall be as required by this section and Table 1704.7. The approved soils report, required by Section 1802.2, and the construction documents prepared by the registered design professionals shall be used to determine compliance. During fill placement, the special inspector shall determine that proper materials and procedures are used in accordance with the provisions of the approved soils report, as specified in Section 1803.5.

Exception: Special inspection is not required during placement of controlled fill having a total depth of 12 inches (305 mm) or less.

1704.8 (Supp) Pile foundations. Special inspections shall be performed during installation and testing of pile foundations as required by Table 1704.8. The approved soils report, required by Section 1802.2, and the construction documents prepared by the registered design professionals shall be used to determine compliance.

1704.9 (Supp) Pier foundations. Special inspections shall be performed during installation and testing of pier foundations as required by Table 1704.9. The approved soils report, required by Section 1802.2, and the construction documents prepared by the registered design professionals shall be used to determine compliance.

Reason: The changes are proposed for consistency with the provisions of Section 106.1 on submittal documents and Sections 106.2 and 1603 on construction documents. Please refer to the 2007 IBC Supplement for the current provisions in Sections 106.1 and 106.2, which were revised by Proposal G222-06/07-AM (Part I).

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: This is a straightforward change which makes it clear that compliance is based on the construction documents.

Assembly Action:

None

Final Hearing Results

S121-07/08

AS

Code Change No: S122-07/08

Original Proposal

Sections: 1704.7, Table 1704.7, 1704.8, Table 1704.8, 1704.9, Table 1704.9, 1704.10, 1707.5, 1803.5

Proponent: Edwin T. Huston, Smith & Huston, Inc., representing the National Council of Structural Engineering Associations

1. Revise as follows:

1704.7 (Supp) Soils. Special inspections for existing site soil conditions, fill placement and load-bearing requirements shall be as required by this section and Table 1704.7. The approved soils geotechnical report, ~~required by Section 1802.2~~, and the documents prepared by the registered design professional shall be used to determine compliance. During fill placement, the special inspector shall determine that proper materials and procedures are used in accordance with the provisions of the approved soils geotechnical report, ~~as specified in Section 1803.5~~.

Exception: ~~Special inspection is not required during placement of controlled fill having a total depth of 12 inches (305 mm) or less. Where Section 1803 does not require reporting of materials and procedures for fill placement, the special inspector shall verify that fill is compacted to a minimum of 90 percent Modified Proctor in accordance with ASTM D 1557.~~

**TABLE 1704.7
REQUIRED VERIFICATION AND INSPECTION OF SOILS**

VERIFICATION AND INSPECTION TASK	CONTINUOUS DURING TASK LISTED	PERIODICALLY DURING TASK LISTED
1. Verify materials below footings <u>shallow foundations</u> are adequate to achieve the design bearing capacity.	—	X
2. Verify excavations are extended to proper depth and have reached proper material.	—	X
3. Perform classification and testing of controlled <u>compacted fill</u> materials.	—	X
4. Verify use of proper materials, densities and lift thicknesses during placement and compaction of controlled <u>compacted fill</u> .	X	—
5. Prior to placement of controlled <u>compacted fill</u> , observe subgrade and verify that site has been prepared properly.	—	X

1704.8 (Supp) Pile Driven deep foundations. Special inspections shall be performed during installation and testing of pile driven deep foundations elements as required by Table 1704.8. The approved ~~soils~~ geotechnical report, ~~required by Section 1802.2,~~ and the documents prepared by the registered design professional shall be used to determine compliance.

**TABLE 1704.8
REQUIRED VERIFICATION AND INSPECTION OF PILE DRIVEN DEEP FOUNDATION ELEMENTS**

VERIFICATION AND INSPECTION TASK	CONTINUOUS DURING TASK LISTED	PERIODICALLY DURING TASK LISTED
1. Verify <u>pile element</u> materials, sizes and lengths comply with the requirements.	X	—
2. Determine capacities of test <u>piles elements</u> and conduct additional load tests, as required.	X	—
3. Observe driving operations and maintain complete and accurate records for each <u>pile element</u> .	X	—
4. Verify placement locations and plumbness, confirm type and size of hammer, record number of blows per foot of penetration, determine required penetrations to achieve design capacity, record tip and butt elevations and document any <u>pile damage to foundation elements</u> .	X	—
5. For steel <u>piles elements</u> , perform additional inspections in accordance with Section 1704.3.	—	—
6. For concrete <u>piles elements</u> and concrete-filled <u>piles elements</u> , perform additional inspections in accordance with Section 1704.4.	—	—
7. For specialty <u>piles elements</u> , perform additional inspections as determined by the registered design professional in responsible charge.	—	—
8. For augered uncased piles and caisson piles, perform inspections in accordance with Section 1704.9.	—	—

1704.9 (Supp) Pier Cast-in-place deep foundations. Special inspections shall be performed during installation and testing of pier cast-in-place deep foundations elements as required by Table 1704.9. The approved ~~soils~~ geotechnical report, ~~required by Section 1802.2,~~ and the documents prepared by the registered design professional shall be used to determine compliance.

**TABLE 1704.9
REQUIRED VERIFICATION AND INSPECTION OF PIER CAST-IN-PLACE DEEP FOUNDATION ELEMENTS**

VERIFICATION AND INSPECTION TASK	CONTINUOUS DURING TASK LISTED	PERIODICALLY DURING TASK LISTED
1. Observe drilling operations and maintain complete and accurate records for each <u>element pier</u> .	X	—
2. Verify placement locations and plumbness, confirm <u>element pier</u> diameters, bell diameters (if applicable), lengths, embedment into bedrock (if applicable) and adequate end bearing strata capacity.	X	—
3. For concrete <u>elements piers</u> , perform additional inspections in accordance with Section 1704.4.	—	—
4. For masonry piers, perform additional inspections in accordance with Section 1704.5.	—	—

1704.10 Vertical masonry foundation elements. ~~Special inspection shall be performed in accordance with Section 1704.5 for vertical masonry foundation elements.~~

(Renumber subsequent sections)

2. Delete without substitution:

~~**1707.5 Pier foundations.** Special inspection is required for pier foundations for buildings assigned to Seismic Design Category C, D, E or F in accordance with Section 1613. Periodic special inspection is required during placement of reinforcement and continuous special inspection is required during placement of the concrete.~~

3. Revise as follows:

1803.5 Compacted fill material. Where footings will bear on compacted fill material, the compacted fill shall comply with the provisions of an approved report, which shall contain the following:

1. Specifications for the preparation of the site prior to placement of compacted fill material.
2. Specifications for material to be used as compacted fill.
3. Test method to be used to determine the maximum dry density and optimum moisture content of the material to be used as compacted fill.
4. Maximum allowable thickness of each lift of compacted fill material.
5. Field test method for determining the in-place dry density of the compacted fill.
6. Minimum acceptable in-place dry density expressed as a percentage of the maximum dry density determined in accordance with Item 3.
7. Number and frequency of field tests required to determine compliance with Item 6.

Exception: ~~Compacted fill material less than 12 inches (305 mm) in depth or less~~ need not comply with an approved report, provided it has been compacted to a minimum of 90 percent Modified Proctor in accordance with ASTM D 1557. The compaction shall be verified by ~~a qualified inspector approved by the building official~~ special inspection in accordance with Section 1704.7.

Reason: Code clarification and update.

Removes conflict between Section 1704.7 (no special inspection) and Section 1803.5 (special inspection required). Corrects “controlled” as “compacted” in Table 1704.7.

Removes Section 1707.5, which is unnecessary. Section 1704.9 sets forth special inspection requirements for piers. Item 3 in Table 1704.9 requires compliance with Section 1704.4. For ALL seismic design categories Table 1704.4 requires periodic special inspection of reinforcement and continuous special inspection of concrete placement.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Errata: Revise Exception to Section 1803.5 as follows:

Exception: ~~Compacted fill material less than 12 inches (305 mm) in depth or less~~ need not comply with an approved report, provided it has been compacted to a minimum of 90 percent Modified Proctor in accordance with ASTM D 1557. The compaction shall be verified by ~~a qualified inspector approved by the building official~~ special inspection in accordance with Section 1704.7.

Committee Action:

Approved as Modified

Modify proposal as follows:

1704.7 (Supp) Soils. Special inspections for existing site soil conditions, fill placement and load-bearing requirements shall be as required by this section and Table 1704.7. The approved geotechnical report, and the documents prepared by the registered design professional shall be used to determine compliance. During fill placement, the special inspector shall determine that proper materials and procedures are used in accordance with the provisions of the approved geotechnical report.

Exception: Where Section 1803 does not require reporting of materials and procedures for fill placement, the special inspector shall verify that the in-place dry density of the compacted fill is compacted to a minimum of not less than 90 percent of the maximum dry density at optimum moisture content determined Modified Proctor in accordance with ASTM D 1557.

1803.5 Compacted fill material. Where footings will bear on compacted fill material, the compacted fill shall comply with the provisions of an approved report, which shall contain the following:

1. Specifications for the preparation of the site prior to placement of compacted fill material.
2. Specifications for material to be used as compacted fill.
3. Test method to be used to determine the maximum dry density and optimum moisture content of the material to be used as compacted fill.
4. Maximum allowable thickness of each lift of compacted fill material.

5. Field test method for determining the in-place dry density of the compacted fill.
6. Minimum acceptable in-place dry density expressed as a percentage of the maximum dry density determined in accordance with Item 3.
7. Number and frequency of field tests required to determine compliance with Item 6.

Exception: Compacted fill material 12 inches (305 mm) in depth or less need not comply with an approved report, provided the in-place dry density is not less than it has been compacted to a minimum of 90 percent of the maximum dry density at optimum moisture content Modified Proctor in accordance with ASTM D 1557. The compaction shall be verified special inspection in accordance with Section 1704.7.

(Portions of proposal not shown remain unchanged)

Committee Reason: This proposal clarifies the requirements for special inspections of soil and fill. The modification rewords the exceptions for consistency with ASTM D 1557.

Assembly Action:

None

Final Hearing Results

S122-07/08

AM

Code Change No: **S123-07/08**

Original Proposal

Table 1704.9

Proponent: Edwin T. Huston, Smith & Huston, Inc., representing National Council of Structural Engineering Associations

Revise table as follows:

**TABLE 1704.9
REQUIRED VERIFICATION AND INSPECTION OF PIER FOUNDATIONS**

VERIFICATION AND INSPECTION TASK	CONTINUOUS DURING TASK LISTED	PERIODICALLY DURING TASK LISTED
1. Observe drilling operations and maintain complete and accurate records for each pier.	X	—
2. Verify placement locations and plumbness, confirm pier diameters, bell diameters (if applicable), lengths, embedment into bedrock (if applicable) and adequate end bearing strata capacity. <u>Record concrete or grout volumes.</u>	X	—
3. For concrete piers, perform additional inspections in accordance with Section 1704.4.	—	—
4. For masonry piers, perform additional inspections in accordance with Section 1704.5.	—	—

Reason: Code update. Adds an item to the required special inspections for piers to reflect typical practice. Continuous special inspection is already required during placement of concrete (Table 1704.4, item 6). Recorded volumes of concrete or grout placed are often the first indicator of potentially significant problems with the construction.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: Recording concrete volume is a critical diagnostic tool. Adding it to the required special inspections for piers is consistent with current practice.

Assembly Action:

None

Final Hearing Results

S123-07/08

AS

Code Change No: **S125-07/08**

Original Proposal

Sections: 1705.3, 1707.1, 1708.2

Proponent: Bonnie Manley, American Iron and Steel Institute, representing American Institute of Steel Construction

1. Revise as follows:

1705.3 (Supp) Seismic resistance. The statement of special inspections shall include seismic requirements for the following cases:

1. The seismic-force-resisting systems in structures assigned to Seismic Design Category C, D, E or F, in accordance with Section 1613.
2. Designated seismic systems in structures assigned to Seismic Design Category D, E or F.
3. The following additional systems and components in structures assigned to Seismic Design Category C:
 - 3.1. Heating, ventilating and air-conditioning (HVAC) ductwork containing hazardous materials and anchorage of such ductwork.
 - 3.2. Piping systems and mechanical units containing flammable, combustible or highly toxic materials.
 - 3.3. Anchorage of electrical equipment used for emergency or standby power systems.
4. The following additional systems and components in structures assigned to Seismic Design Category D:
 - 4.1. Systems required for Seismic Design Category C.
 - 4.2. Exterior wall panels and their anchorage.
 - 4.3. Suspended ceiling systems and their anchorage.
 - 4.4. Access floors and their anchorage.
 - 4.5. Steel storage racks and their anchorage, where the importance factor is equal to 1.5 in accordance with Section 15.5.3 of ASCE 7.
5. The following additional systems and components in structures assigned to Seismic Design Category E or F:
 - 5.1. Systems required for Seismic Design Categories C and D.
 - 5.2. Electrical equipment.

Exception: Seismic requirements are permitted to be excluded from the statement of special inspections for structures designed and constructed in accordance with the following:

1. The structure consists of light-frame construction; the design spectral response acceleration at short periods, S_{DS} , is determined in Section 1613.5.4, does not exceed 0.5g; and the height of the structure does not exceed 35 feet (10 668 mm) above grade plane; or
2. The structure is constructed using a reinforced masonry structural system or reinforced concrete structural system; the design spectral response acceleration at short periods, S_{DS} , as determined in Section 1613.5.4, does not exceed 0.5g, and the height of the structure does not exceed 25 feet (7620 mm) above grade plane; or
3. Detached one- or two-family dwellings not exceeding two stories above grade plane, provided the structure does not have any of the following plan or vertical irregularities in accordance with Section 12.3.2 of ASCE 7:
 - 3.1. Torsional irregularity.
 - 3.2. Nonparallel systems.
 - 3.3. Stiffness irregularity extreme soft story and soft story.
 - 3.4. Discontinuity in capacity weak story.
4. Steel systems in structures that are assigned to Seismic Design Category C that are not specifically detailed for seismic resistance, with a response modification coefficient, R, of 3 or less, excluding cantilever column systems.

1707.1 Special inspections for seismic resistance. Special inspections itemized in Sections 1707.2 through 1707.10, unless exempted by the exceptions of Section 1704.1 or 1705.3, are required for the following:

1. The seismic-force-resisting systems in structures assigned to Seismic Design Category C, D, E or F, as determined in Section 1613.
2. Designated seismic systems in structures assigned to Seismic Design Category D, E or F.
3. Architectural, mechanical and electrical components in structures assigned to Seismic Design Category C, D, E or F that are required in Sections 1707.7 and 1707.8.

1708.2 (Supp) Testing and qualification for seismic resistance. The testing and qualification specified in Sections 1708.3 through 1708.6, unless exempted from special inspections by the exceptions of Section 1704.1 and 1705.3, are required as follows:

1. The seismic-force-resisting systems in structures assigned to Seismic Design Category C, D, E or F, as determined in Section 1613 shall meet the requirements of Sections 1708.3 and 1708.4, as applicable.
2. Designated seismic systems in structures assigned to Seismic Design Category D, E or F in Section 13.2.2 of ASCE 7 shall meet the requirements of Section 1708.5.
3. Architectural, mechanical and electrical components in structures assigned to Seismic Design Category C, D, E or F with an $I_p = 1.0$ shall be permitted to be seismically qualified by meeting the requirements of Section 1708.5.
4. The seismic isolation system in seismically isolated structures shall meet the testing requirements of Section 1708.6.

Reason: In Sections 1705.3, 1707.1 and 1708.2, a general reference to SDC C is included for seismic force resisting systems in order to recognize that many structural systems require special detailing because of their seismic response characteristics. However, this general requirement does not reflect the unique response characteristics of some steel buildings. ASCE 7-05, Table 12.2-1 assigns steel building structures a response modification coefficient of $R = 3$, if they are built in SDC A, B or C as a “steel system not specifically detailed for seismic resistance, excluding cantilever column systems.” For these building systems, the assigned seismic response coefficient reflects their inherent ductility. As a consequence, these structures are permitted to be constructed using only AISC 360 (that is, not detailed in accordance with the additional provisions of AISC 341). As these construction details and connections are the same as would be used in typical steel buildings following AISC 360, no additional inspection or testing should be required beyond that applied to typical steel buildings. The modifications to IBC Sections 1705.3, 1707.1 and 1708.2 reflect this concept.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Modified

Modify proposal as follows:

1705.3 (Supp) Seismic resistance. The statement of special inspections shall include seismic requirements for the following cases:

1. The seismic-force-resisting systems in structures assigned to Seismic Design Category C, D, E or F, in accordance with Section 1613.

Exception: Requirements for the seismic-force resisting system are permitted to be excluded from the statement of special inspections for steel systems in structures assigned to Seismic Design Category C that are not specifically detailed for seismic resistance, with a response modification coefficient, R , of 3 or less, excluding cantilever column systems.

2. Designated seismic systems in structures assigned to Seismic Design Category D, E or F.
3. The following additional systems and components in structures assigned to Seismic Design Category C:
 - 3.1. Heating, ventilating and air-conditioning (HVAC) ductwork containing hazardous materials and anchorage of such ductwork.
 - 3.2. Piping systems and mechanical units containing flammable, combustible or highly toxic materials.
 - 3.3. Anchorage of electrical equipment used for emergency or standby power systems.
4. The following additional systems and components in structures assigned to Seismic Design Category D:
 - 4.1. Systems required for Seismic Design Category C.
 - 4.2. Exterior wall panels and their anchorage.
 - 4.3. Suspended ceiling systems and their anchorage.
 - 4.4. Access floors and their anchorage.
 - 4.5. Steel storage racks and their anchorage, where the importance factor is equal to 1.5 in accordance with Section 15.5.3 of ASCE 7.
5. The following additional systems and components in structures assigned to Seismic Design Category E or F:
 - 5.1. Systems required for Seismic Design Categories C and D.
 - 5.2. Electrical equipment.

Exception: Seismic requirements are permitted to be excluded from the statement of special inspections for structures designed and constructed in accordance with the following:

1. The structure consists of light-frame construction; the design spectral response acceleration at short periods, $S_p S$, is determined in Section 1613.5.4, does not exceed 0.5g; and the height of the structure does not exceed 35 feet (10 668 mm) above grade plane; or

2. The structure is constructed using a reinforced masonry structural system or reinforced concrete structural system; the design spectral response acceleration at short periods, S_{DS} , as determined in Section 1613.5.4, does not exceed 0.5g, and the height of the structure does not exceed 25 feet (7620 mm) above grade plane; or
3. Detached one- or two-family dwellings not exceeding two stories above grade plane, provided the structure does not have any of the following plan or vertical irregularities in accordance with Section 12.3.2 of ASCE 7:
 - 3.1. Torsional irregularity.
 - 3.2. Nonparallel systems.
 - 3.3. Stiffness irregularity extreme soft story and soft story.
 - 3.4. Discontinuity in capacity weak story.
4. ~~Steel systems in structures that are assigned to Seismic Design Category C that are not specifically detailed for seismic resistance, with a response modification coefficient, R , of 3 or less, excluding cantilever column systems.~~

(Portions of proposal not shown remain unchanged)

Committee Reason: The committee agrees that the new exception is consistent with the intent of the current code and differentiates between designs under AISC 360 versus AISC 341. The modification puts the exception in a more appropriate location.

Assembly Action:

None

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

David P. Tyree, American Forest and Paper Association, requests Approval as Modified by this Public Comment.

Further modify proposal as follows:

1705.3 Seismic resistance. The statement of special inspections shall include seismic requirements for ~~the following cases:~~ cases covered in Sections 1705.3.1 through 1705.3.5.

Exception: Seismic requirements are permitted to be excluded from the statement of special inspections for structures designed and constructed in accordance with the following:

1. The structure consists of light-frame construction; the design spectral response acceleration at short periods, S_{DS} , as determined in Section 1613.5.4, does not exceed 0.5g; and the height of the structure does not exceed 35 feet (10 668 mm) above grade plane; or
2. The structure is constructed using a reinforced masonry structural system or reinforced concrete structural system; the design spectral response acceleration at short periods, S_{DS} , as determined in Section 1613.5.4, does not exceed 0.5g, and the height of the structure does not exceed 25 feet (7620 mm) above grade plane; or
3. Detached one- or two-family dwellings not exceeding two stories above grade plane, provided the structure does not have any of the following plan or vertical irregularities in accordance with Section 12.3.2 of ASCE 7:
 - 3.1. Torsional irregularity.
 - 3.2. Nonparallel systems.
 - 3.3. Stiffness irregularity-extreme soft story and soft story.
 - 3.4. Discontinuity in capacity-weak story.

~~1705.3.1~~ 4. The seismic-force-resisting systems in structures assigned to Seismic Design Category C, D, E or F, in accordance with Section 1613.

Exception: Requirements for the seismic-force resisting system are permitted to be excluded from the statement of special inspections for steel systems in structures assigned to Seismic Design Category C that are not specifically detailed for seismic resistance, with a response modification coefficient, R , of 3 or less, excluding cantilever column systems.

~~1705.3.2~~ 2. Designated seismic systems in structures assigned to Seismic Design Category D, E or F.

~~1705.3.3~~ 3. The following additional systems and components in structures assigned to Seismic Design Category C:

- 3.1. Heating, ventilating and air-conditioning (HVAC) ductwork containing hazardous materials and anchorage of such ductwork.
- 3.2. Piping systems and mechanical units containing flammable, combustible or highly toxic materials.
- 3.3. Anchorage of electrical equipment used for emergency or standby power systems.

~~1705.3.4~~ 4. The following additional systems and components in structures assigned to Seismic Design Category D:

- 4.1. Systems required for Seismic Design Category C.
- 4.2. Exterior wall panels and their anchorage.
- 4.3. Suspended ceiling systems and their anchorage.
- 4.4. Access floors and their anchorage.
- 4.5. Steel storage racks and their anchorage, where the importance factor is equal to 1.5 in accordance with Section 15.5.3 of ASCE 7.

1705.3.5 ~~5~~. The following additional systems and components in structures assigned to Seismic Design Category E or F:

- ~~5.1. Systems required for Seismic Design Categories C and D.~~
- ~~5.2. Electrical equipment.~~

Exception: ~~Seismic requirements are permitted to be excluded from the statement of special inspections for structures designed and constructed in accordance with the following:~~

- ~~1. The structure consists of light frame construction; the design spectral response acceleration at short periods, *SDS*, is determined in Section 1613.5.4, does not exceed 0.5g; and the height of the structure does not exceed 35 feet (10 668 mm) above grade plane; or~~
- ~~2. The structure is constructed using a reinforced masonry structural system or reinforced concrete structural system; the design spectral response acceleration at short periods, *SDS*, as determined in Section 1613.5.4, does not exceed 0.5g, and the height of the structure does not exceed 25 feet (7620 mm) above grade plane; or~~
- ~~3. Detached one- or two-family dwellings not exceeding two stories above grade plane, provided the structure does not have any of the following plan or vertical irregularities in accordance with Section 12.3.2 of ASCE 7:~~
 - ~~3.1. Torsional irregularity.~~
 - ~~3.2. Nonparallel systems.~~
 - ~~3.3. Stiffness irregularity extreme soft story and soft story.~~
 - ~~3.4. Discontinuity in capacity weak story.~~

(Portions of proposal not shown remain unchanged)

Commenter's Reason: This public comment is editorial in nature and rennumbers this section and the original proposal into a more user friendly format. Further, it relocates the existing exception which is placed under the current 5.1 (which obviously does not apply to electrical equipment and will cause confusion) to apply to the appropriate section, Section 1705.3.

Final Hearing Results

S125-07/08

AMPC

Code Change No: S127-07/08

Original Proposal

Section: 1706.1

Proponent: D. Kirk Harman, PE, SE, The Harman Group, Inc., representing The National Council of Structural Engineers Associations (NCSEA) Code Advisory Committee, Quality Assurance and Special Inspection Subcommittee

Delete without substitution:

SECTION 1706 CONTRACTOR RESPONSIBILITY

~~**1706.1 Contractor responsibility.** Each contractor responsible for the construction of a main wind- or seismic-force-resisting system, designated seismic system or a wind- or seismic-resisting component listed in the statement of special inspections shall submit a written statement of responsibility to the building official and the owner prior to the commencement of work on the system or component. The contractor's statement of responsibility shall contain the following: 1. Acknowledgment of awareness of the special requirements contained in the statement of special inspections; 2. Acknowledgment that control will be exercised to obtain conformance with the construction documents approved by the building official; 3. Procedures for exercising control within the contractor's organization, the method and frequency of reporting and the distribution of the reports; and 4. Identification and qualifications of the person(s) exercising such control and their position(s) in the organization.~~

(Renumber subsequent sections)

Reason: This requirement was originally to go along with the Quality Assurance Plan, which has now been deleted from the code. The requirement is unenforceable, is not followed typically by contractors and is often ignored by jurisdictions.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: There is no need for the section on contractor responsibility. Contractor responsibility is already implicit.

Assembly Action:

None

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because public comments were submitted.

Public Comment 1:

Stephan Kiefer, City of Livermore, representing Peninsula, East Bay and Monterey Bay Chapters (Tri-Chapters), requests Approval as Modified by this Public Comment.

Replace proposal as follows:

1706.1 Contractor responsibility. Each contractor responsible for the construction of a main wind- or seismic-force-resisting system, designated seismic system or a wind- or seismic-resisting component listed in the statement of special inspections shall submit a written statement of responsibility to the building official and the owner prior to the commencement of work on the system or component. The contractor's statement of responsibility shall contain ~~the following:~~ acknowledgement of awareness of the special requirements contained in the statement of special inspection.

- ~~1. Acknowledgement of awareness of the special requirements contained in the statement of special inspections;~~
- ~~2. Acknowledgement that control will be exercised to obtain conformance with the construction documents approved by the building official;~~
- ~~3. Procedures for exercising control within the contractor's organization, the method and frequency of reporting and the distribution of the reports; and~~
- ~~4. Identification and qualifications of the person(s) exercising such control and their position(s) in the organization.~~

Commenter's Reason: "Section 1704.1.1 requires that the registered design professional in responsible charge prepare and submits a "statement of special inspections" identifying the special inspections and tests required by Sections 1704, 1707, and 1708. Section 1706, as currently written, requires the Contractor to submit a written statement to the building official and to the owner acknowledging awareness of the items in the statement of special inspection, and describing how the contractor's quality control effort will be used to ensure that the work conforms with the construction documents. This section came into IBC at the beginning, directly from the Quality Assurance provisions of the NEHRP "Recommended Provisions for the Development of Seismic Regulations for New Buildings" (FEMA 95 from 1986, FEMA 222A from 1995.) These documents were the source for the "Quality Assurance Plan" of earlier editions of the IBC that is now called the statement of special inspection.

The contractor's statement of responsibility is a central part of this nationally-recognized long-standing effort to improve construction quality for seismic resistance by stressing the Contractor's Quality Control effort as an important element of the overall construction quality assurance effort, and thus should not be completely removed. This proposed modification simplifies the existing language by eliminating items 2, 3 and 4."

Final Hearing Results

S127-07/08

AMPC1

Code Change No: S128-07/08

Original Proposal

Section: 1707.2

Proponent: Bonnie Manley, American Iron and Steel Institute, representing American Institute of Steel Construction

Revise as follows:

1707.2 Structural steel. ~~Continuous special inspection is required for structural welding in accordance with AISC 341.~~ Special inspection for structural steel members shall be in accordance with the quality assurance plan requirements of AISC 341.

Exceptions:

1. ~~Single pass fillet welds not exceeding 5/16 inch (7.9 mm) in size.~~
2. ~~Floor and roof deck welding.~~

Reason: Between the 2003 and 2006 editions of the IBC, the terminology in Section 1705 was changed from “quality assurance plan” to “statement of special inspection”. Unfortunately, the change in terminology was not picked up in time for the 2005 edition of AISC 341, *Seismic Provisions for Structural Steel Buildings*. In order to ensure that there is no confusion, a direct reference to the quality assurance plan requirements in AISC 341 is recommended for structural steel members. Part 1, Appendix Q of the 2005 AISC Seismic Provisions provides a comprehensive Quality Assurance Plan including Tables of QC and QA inspection requirements. For structures designed according to AISC 341, it is required that QC and QA be provided as specified in that section.

Earlier versions of AISC 341 did not specifically address the frequency of welding inspection. However, the Quality Assurance Plan in Appendix Q of AISC 341-05 now addresses frequency of inspection. The first exception for single pass fillet welds is recommended for deletion. Fillet welds are now covered in Appendix Q of AISC 341-05, so the exception is no longer necessary. Also, the second exception for floor and roof deck welding is recommended for deletion. This section requires adequate special inspections for seismic resistance of structural steel only. Section 1704.3 Exception 2.2 already sufficiently addresses the welding of the floor and roof deck in a general manner.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:**Approved as Modified****Modify proposal as follows:**

1707.2 Structural steel. Special inspection for structural steel ~~members~~ shall be in accordance with the quality assurance plan requirements of AISC 341.

Exception: Special inspections of structural steel in structures assigned to Seismic Design Category C that are not specifically detailed for seismic resistance, with a response modification coefficient, R, of 3 or less, excluding cantilever column systems.

Committee Reason: This proposal helps clarify special inspections for seismic resistance. The modification adds as exception that is consistent with the intent of the current code as well as the action taken on S125-07/08.

Assembly Action:**None**

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

W. Lee Shoemaker, P.E., Ph.D., Thomas Associates Inc, representing Metal Building Manufacturers Association, requests Approval as Modified by this Public Comment.

Further modify proposal as follows:

1707.2 Structural steel. Special inspection for structural steel shall be in accordance with the quality assurance plan requirements of AISC 341.

Exceptions:

1. Special inspections of structural steel in structures assigned to Seismic Design Category C that are not specifically detailed for seismic resistance, with a response modification coefficient, R, of 3 or less, excluding cantilever column systems.
2. For ordinary moment frames, ultrasonic and magnetic particle testing of complete joint penetration groove welds is only required for demand critical welds.

Commenter-s Reason: This proposal is consistent with ongoing discussions at AISC to modify AISC 341 in recognition that ordinary moment frames have minimal inelastic straining. Therefore, only demand critical welds are of concern with regard to potential flaws in complete joint penetration groove welds. The first exception was accepted by the ICC Structural Committee as a modification by the proponent. The added exception is the modification requested by this public comment to make IBC 2009 consistent with what has been proposed to AISC 341 update process. But, because IBC-09 will reference the older edition of AISC 341 (2005), this exception needs to be added here as well. This is intended to be a temporary solution until AISC 341-10 is completed and adopted by the IBC.

Final Hearing Results

S128-07/08**AMPC**

Code Change No: S129-07/08

Original Proposal

Section: 1707.4

Proponent: Bonnie Manley, American Iron and Steel Institute, American Iron and Steel Institute

Revise as follows:

1707.4 Cold-formed steel framing and cold-formed steel light frame construction. Periodic special inspection is required during welding operations of elements of the seismic-force-resisting system. Periodic special inspection is required for screw attachment, bolting, anchoring and other fastening of components within the seismic-force-resisting system, including struts, braces, and hold-downs.

Exception: Special inspection is not required for cold-formed steel light frame shearwalls, shear panels and diaphragms, including screw attachment, bolting, anchoring and other fastening to other components of the seismic-force-resisting system, where either of the following apply:

1. The sheathing is gypsum board or fiberboard.
2. The sheathing is wood structural panel or steel sheets on only one side of the shear wall, shear panel or diaphragm assembly and the fastener spacing of the sheathing is more than 4 inches (102 mm) on center (o.c.).

Reason: The title of the section has been modified editorially to match the terminology used in IBC Section 2209 and Section 2210.

Wood and cold-formed steel light frame construction have similar requirements for their lateral force resisting systems. Therefore, the exception in IBC Section 1707.3 should also apply, with the appropriate adaptation, to cold-formed steel light frame construction. A quick historical review indicated that the 4" spacing for wood construction roughly translates to a minimum capacity of 380lb/ft. Cold-formed steel light frame shear walls, shear panels and diaphragms meeting the above requirements satisfy this minimum capacity, per AISI S213-07, *North American Standard for Cold-Formed Steel Framing – Lateral Design*.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Modified

Modify proposal as follows:

1707.4 Cold-formed steel and cold-formed steel light frame construction. Periodic special inspection is required during welding operations of elements of the seismic-force-resisting system. Periodic special inspection is required for screw attachment, bolting, anchoring and other fastening of components within the seismic-force-resisting system, including shear walls, struts, braces, diaphragms, collectors (drag struts) and hold-downs.

Exception: Special inspection is not required for cold-formed steel light frame shear walls, ~~braces, shear panels and~~ diaphragms, ~~collectors (drag struts), and hold downs including screw attachment, bolting, anchoring and other fastening to other components of the seismic-force-resisting system,~~ where either of the following apply:

1. The sheathing is gypsum board or fiberboard.
2. The sheathing is wood structural panel or steel sheets on only one side of the shear wall, shear panel or diaphragm assembly and the fastener spacing of the sheathing is more than 4 inches (102 mm) on center (o.c.).

Committee Reason: This proposal makes appropriate editorial corrections to special inspection requirements for cold-formed steel. The modification corrects the title to more accurately reflect the subject matter and makes the charging language consistent with the exception.

Assembly Action:

None

Final Hearing Results

S129-07/08

AM

Code Change No: S130-07/08

Original Proposal

Section: 1707.7

Proponent: Andy Williams, Alcan Composites USA, Inc., representing himself

Revise as follows:

1707.7 (Supp) Architectural components. Periodic special inspection during the erection and fastening of exterior cladding, interior and exterior nonbearing walls and interior and exterior veneer in structures assigned to Seismic Design Category D, E, or F.

Exceptions:

1. Special inspection is not required for exterior cladding, interior and exterior nonbearing walls and interior and exterior veneer 30 feet (9144 mm) or less in height above grade or walking surface.
2. Special inspection is not required for exterior cladding and interior and exterior veneer weighing 5 psf (24.5 N/m²) or less.
3. Special inspection is not required for interior nonbearing walls weighing 15 psf (73.5 N/m²) or less.

Reason: This code change proposal is merely intended to editorially clarify the exceptions to this section which was revised during the last code development cycle. It is not intended to make any technical changes. It simply utilizes wording within the exceptions that is consistent with the wording in the charging paragraph to which the exceptions are made. Thus, the language in the exceptions will parallel the language in the main paragraph as the exceptions apply to the specific cases indicated. This should make these exceptions much more user friendly and easier to enforce.

Cost Impact: The code change proposal will not increase the cost of construction.

Committee Action:

Approved as Submitted

Committee Reason: This proposal is editorial and clearly defines the wall types in Exceptions 1 and 2.

Assembly Action:

None

Final Hearing Results

S130-07/08

AS

Code Change No: S133-07/08

Original Proposal

Section: 1708.3

Proponent: Bonnie Manley, American Iron and Steel Institute, representing American Iron and Steel Institute

Revise as follows:

1708.3 (Supp) Cold-formed steel framing ~~light-frame construction~~. Periodic special inspection is required during welding operations of elements of the main wind-force-resisting system. Periodic special inspection is required for screw attachment, bolting, anchoring and other fastening of components within the main wind-force-resisting system, including struts, braces, and holdowns.

Exception: Special inspection is not required for cold-formed steel light-frame shearwalls, shear panels and diaphragms, including screw attachment, bolting, anchoring and other fastening to other components of the main wind-force-resisting system, where either of the following apply:

1. The sheathing is gypsum board or fiberboard.
2. The sheathing is wood structural panel or steel sheets on only one side of the shear wall, shear panel or diaphragm assembly and the fastener spacing of the sheathing is more than 4 inches (102 mm) on center (o.c.).

Reason: The title of the section has been modified editorially to match the terminology used in IBC Section 2210.

Wood and cold-formed steel light frame construction have similar requirements for their lateral force resisting systems. Therefore, the exception in IBC Section 1707.3 should also apply, with the appropriate adaptation, to cold-formed steel light frame construction. A quick historical review indicated that the 4" spacing for seismic detailing of wood construction, which is the presumed source of the wood construction exception, roughly translates to a minimum capacity of 380lb/ft. Cold-formed steel light frame shear walls, shear panels and diaphragms meeting the above requirements satisfy this minimum capacity, per AISI S213-07, *North American Standard for Cold-Formed Steel Framing – Lateral Design*.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Modified

Modify proposal as follows:

1708.3 (Supp) Cold-formed steel light-frame construction. Periodic special inspection is required during welding operations of elements of the main wind-force-resisting system. Periodic special inspection is required for screw attachment, bolting, anchoring and other fastening of components within the main wind-force-resisting system, including shear walls, struts, braces, diaphragms, collectors (drag struts) and hold downs.

Exception: Special inspection is not required for cold-formed steel light-frame shear walls, braces, shear panels and diaphragms, collectors (drag struts) and hold downs including screw attachment, bolting, anchoring and other fastening to other components of the main wind-force-resisting system, where either of the following apply:

1. The sheathing is gypsum board or fiberboard.
2. The sheathing is wood structural panel or steel sheets on only one side of the shear wall, shear panel or diaphragm assembly and the fastener spacing of the sheathing is more than 4 inches (102 mm) on center (o.c.).

Committee Reason: This code change brings consistent and more concise language to the special inspection requirements for cold formed steel. The modification provides consistency between the exception and the charging language.

Assembly Action:

None

Final Hearing Results

S133-07/08

AM

Code Change No: S135-07/08

Original Proposal

Section: 1708.2

Proponent: Jim W. Sealy, FAIA; Robert E. Bachman, SE; and John D. Gillengerten, Building Seismic Safety Council of the National Institute of Building Sciences, representing FEMA/BSSC Code Resource Support Committee

Revise as follows:

1708.2 (Supp) Testing for seismic resistance. ~~The tests and qualification specified in Sections 1708.3 through 1708.6 are required as follows:~~

1. The seismic-force-resisting systems in structures assigned to Seismic Design Category C, D, E or F, as determined in Section 1613, shall meet the requirements of Sections 1708.3 and 1708.4, as applicable.
2. Designated seismic systems in structures assigned to Seismic Design Category C, D, E or F ~~is~~ subject to the special certification requirements of ASCE 7 Section 13.2.2 of ASCE shall meet the requirements of ~~are required to be tested in accordance with~~ Section 1708.5.
3. Architectural, mechanical and electrical components in structures assigned to Seismic Design Category C, D, E or F with an $I_p=1.0$ ~~shall be permitted to be seismically qualified by meeting the requirements of Section 1708.5~~ are required to be tested in accordance with Section 1708.5 where the general design requirements of ASCE 7 Section 13.2.1.2 for manufacturer's certification are satisfied by testing.
4. Seismic Isolation Systems are required to be tested in accordance with Section 1708.6.

Reason: This proposal clarifies the requirements for special certification of designated seismic systems. In ASCE 7, all nonstructural components must comply with general design provisions of Section 13.2.1. This section permits justification of components by project-specific design or certification by the manufacturer. The manufacturer can use analysis, testing, or experience data.

Special certification is only required for active mechanical and electrical components that must remain operable following an earthquake, and components with hazardous contents. Obtaining this certification requires shake table testing or use of experience data.

The changes to Items 1 and 4 provide pointers to the appropriate code sections. The changes to item 2 clarify when the special seismic qualification procedures (i.e., shake table testing) are required – only for those components identified in ASCE 7. Item 3 clarifies the process when the basic seismic design requirements (anchorage and bracing) are addressed by a manufacturer's certification.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: This proposal makes editorial changes to the requirements for testing for seismic resistance that help clarify the intent of this provision.

Assembly Action:

None

Final Hearing Results

S135-07/08

AS

Code Change No: **S136-07/08**

Original Proposal

Section: 1708.3

Proponent: Philip Brazil, PE, SE, Reid Middleton, Inc., representing himself

Revise as follows:

1708.3 Reinforcing and prestressing steel. Certified mill test reports shall be provided for each shipment of ~~reinforcing steel reinforcement~~ used to resist flexural, shear and axial forces in reinforced concrete intermediate frames, and special moment frames and boundary elements of special reinforced concrete or reinforced and masonry shear walls. Where reinforcement complying with ASTM A 615 ~~reinforcing steel~~ is used to resist earthquake-induced flexural and axial forces in special moment frames and ~~in wall boundary elements of special reinforced concrete~~ shear walls in structures assigned to Seismic Design Category C, D, E or F, as determined in Section 1613, the testing requirements of Section 21.2.5 of ACI 318 shall be met. Where reinforcement complying with ASTM A 615 ~~reinforcing steel~~ is to be welded, chemical tests shall be performed to determine weldability in accordance with Section 3.5.2 of ACI 318.

Exception: Certified mill test reports are not required to be provided for reinforcement complying with ASTM A 706.

Reason: The purpose of this proposal is to align the provisions of IBC Section 1708.3 with related provisions in ASCE 7 and ACI 318. The reference to axial forces is deleted for consistency with Section 21.2.5 of ACI 318-05. The references to types of seismic-force resisting systems are revised for consistency with Table 12.1-1 of ASCE 7-05. The exception for reinforcement complying with ASTM A 706 is proposed in

recognition of the exemption from any special requirements for the use of such bars by Sections 3.5.2 and 21.2.5 of ACI 318-05. Note that Section 16 of ASTM A 706 specifies requirements for the marking of individual reinforcing bars complying with the standard for ready identification during construction.

The references in the proposal to sections of ACI 318, current and proposed, are to the 2005 edition. I assume the 2008 edition of ACI 318 will be the edition that is referenced in the 2009 IBC. The sections in the public draft of ACI 318-08 corresponding to the sections in the proposal are 21.1.5.2 for Section 21.2.5 and 3.5.2 for Section 3.5.2.

The reference to the testing requirements in Section 21.2.5 of ACI 318-05 ought to specify all frame members and structural wall boundary elements, which could conceivably include intermediate and special reinforced concrete moment frames and shear walls. Section 21.1.5.2 of the public draft of ACI 318-08, however, revises the requirement so that it applies to special moment frames, special structural walls and coupling beams. Section 21.1.1.4 of the public draft on structures assigned to Seismic Design Category C specifies compliance with the applicable provisions of Sections 21.1.3 through 21.1.7 for structures using special moment frames or special structural walls. The proposed revisions incorporate these upcoming changes in ACI 318.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Modified

Modify proposal as follows:

~~1708.3 Reinforcing and prestressing steel Concrete reinforcement. Certified mill test reports shall be provided for each shipment of reinforcement used to resist flexural and axial forces in reinforced concrete intermediate and special moment frames and boundary elements of special reinforced concrete and masonry shear walls. Where reinforcement complying with ASTM A 615 is used to resist earthquake-induced flexural and axial forces in special moment frames, and special reinforced concrete shear structural walls and coupling beams connecting special structural walls, in structures assigned to Seismic Design Category B, C, D, E or F, as determined in Section 1613, the testing requirements of reinforcement shall comply with Section 21.1.5.2 of ACI 318 shall be met. Certified mill test reports shall be provided for each shipment of such reinforcement. Where reinforcement complying with ASTM A 615 is to be welded, chemical tests shall be performed to determine weldability in accordance with Section 3.5.2 of ACI 318.~~

~~**Exception:** Certified mill test reports are not required to be provided for reinforcement complying with ASTM A 706.~~

Committee Reason: This code change to seismic testing of concrete reinforcement provides consistency with the ACI 318 standard. The modification makes further adjustments in the wording and eliminates the proposed exception to certified mill test reports.

Assembly Action:

None

Final Hearing Results

S136-07/08

AM

Code Change No: S137-07/08

Original Proposal

Section: 1708.4, Chapter 35

Proponent: Bonnie Manley, American Iron and Steel Institute, representing American Institute of Steel Construction

1. Revise as follows:

1708.4 (Supp) Structural steel. ~~Testing for structural steel shall be in accordance with the quality assurance plan requirements of AISC 341. The testing contained in the quality assurance plan shall be as required by AISC 341 and the additional requirements herein. The acceptance criteria for nondestructive testing shall be as required in AWS D1.1 as specified by the registered design professional. Base metal thicker than 1.5 inches (38 mm), where subject to through thickness weld shrinkage strains, shall be ultrasonically tested for discontinuities behind and adjacent to such welds after joint completion. Any material discontinuities shall be accepted or rejected on the basis of ASTM A 435 or ASTM A 898 (Level 1 criteria) and criteria as established by the registered design professional(s) in responsible charge and the construction documents~~

2. Revise Chapter 35 as follows:**AISC**

341-05 Seismic Provisions for Structural Steel Buildings, including Supplement No. 1 dated 2005~~6~~. . . . 1613.6.2, 1707.2, 1709~~8~~.4, 2205.2.1, 2205.2.2, 2205.3, 2205.3.1

ASTM INTERNATIONAL

~~A 435/A 435M—90 (2001) Specification for Straight-beam Ultrasonic Examination of Steel Plates~~

~~A 898/A 898M—91 (2001) Specification for Straight-Beam Ultrasonic Examination of Rolled Steel Shapes~~

AWS

D1.1—04 Structural Welding Code—Steel

Reason: Section 1709.4, 1st paragraph (Numbering based upon IBC-06 w/2007 Supplement): Between the 2003 and 2006 editions of the IBC, the terminology in Section 1705 was changed from “quality assurance plan” to “statement of special inspection”. Unfortunately, the change in terminology was not picked up in time for the 2005 edition of AISC 341, *Seismic Provisions for Structural Steel Buildings*. In order to ensure that there is no confusion, a direct reference to the quality assurance plan requirements in AISC 341 is recommended for structural steel. In fact, AISC 341-05 Appendix Q provides the user with the minimum acceptable requirements for a quality assurance plan that applies to the construction of welded joints, bolted joints, and other details in the seismic load resisting system. The requirements of AISC 341, Appendix Q are recommended for implementation without revision. Where appropriate, AISC 341-05 Appendix Q references AWS D1.1 for specific acceptance criteria. Thus, the second sentence of the first paragraph is unnecessary and redundant with language that currently exists in AISC 341-05.

Section 1709.4, 2nd paragraph: The requirements of this paragraph are recommended for deletion. This paragraph focuses on the ultrasonic testing of base metal that may be subject to lamellar tearing or have laminations present. However, AISC 341-05, Section 5.2(2)(c) currently addresses this specific topic by stating when non-destructive testing (NDT) is needed, where it is needed and the appropriate acceptance criteria as follows:

Q5.2(2)(c) Base Metal NDT for Lamellar Tearing and Laminations. After joint completion, base metal thicker than 1-1/2 in. (38 mm) loaded in tension in the through thickness direction in tee and corner joints, where the connected material is greater than 3/4 in. (19 mm) and contains CJP groove welds, shall be ultrasonically tested for discontinuities behind and adjacent to the fusion line of such welds. Any base metal discontinuities found within t/4 of the steel surface shall be accepted or rejected on the basis of criteria of AWS D1.1 Table 6.2, where t is the thickness of the part subjected to the through thickness strain.

Referenced in AISC-341, Section Q5.2(2)(c), AWS D1.1 Table 6.2 provides the acceptance criteria for ultrasonically tested joints when statically loaded. The criteria is similar to that used prior to adoption of the current language in IBC 2000, which had used the term of “larger reflector criteria” in the UBC, and left it to the engineer in the NBC. The “larger reflector criteria”, a termed used in the 1970s, is now identified as a “Class A” discontinuity in Table 6.2. By referencing only Table 6.2, and not referencing Class A, the additional considerations of flaw length and reflector height is made.

Finally, the direct references to ASTM A 435 and ASTM A898 are no longer needed because the AISC 341 criteria has been made more restrictive regarding permitted flaws, and more properly reflects the angle-beam ultrasonic methodology used for post-welding examinations. The prior reference to ASTM A 435 and A 898 were straight-beam ultrasonic tests to detect laminations in base metal prior to welding, and have been deemed inadequate for post-welding lamellar tearing checks.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Modified

Modify proposal as follows:

1708.4 Structural steel. Testing for structural steel shall be in accordance with the quality assurance plan requirements of AISC 341.

Exception: Testing for structural steel in structures assigned to Seismic Design Category C that are not specifically detailed for seismic resistance, with a response modification coefficient, R, of 3 or less, excluding cantilever column systems.

(Portions of proposal not shown remain unchanged)

Committee Reason: This proposal helps clarify structural steel testing requirements for seismic resistance. The modification adds as exception that is consistent with the intent of the current code as well as S125-07/08.

Assembly Action:

None

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

W. Lee Shoemaker, P.E., Ph.D, Thomas Associates, Inc, representing Metal Building Manufacturers Association requests Approval as Modified by this Public Comment.

Further modify proposal as follows:

1708.4 Structural steel. Testing for structural steel shall be in accordance with the quality assurance plan requirements of AISC 341.

Exceptions

1. Testing for structural steel in structures assigned to Seismic Design Category C that are not specifically detailed for seismic resistance, with a response modification coefficient, R, of 3 or less, excluding cantilever column systems.
2. For ordinary moment frames, ultrasonic and magnetic particle testing of complete joint penetration groove welds is only required for demand critical welds.

(Portions of proposal not shown remain unchanged)

Commenter's Reason: This proposal is consistent with ongoing discussions at AISC to modify AISC 341 in recognition that ordinary moment frames have minimal inelastic straining. Therefore, only demand critical welds are of concern with regard to potential flaws in complete joint penetration groove welds. The first exception was accepted by the ICC Structural Committee as a modification by the proponent. The added exception is the modification requested by this public comment to make IBC 2009 consistent with what has been proposed to AISC 341 update process. But, because IBC-09 will reference the older edition of AISC 341 (2005), this exception needs to be added here as well. This is intended to be a temporary solution until AISC 341-10 is completed and adopted by the IBC.

Final Hearing Results

S137-07/08

AMPC

Code Change No: S138-07/08

Original Proposal

Section: 1708.5

Proponent: Jim W. Sealy, FAIA; Robert E. Bachman, SE; and John D. Gillengerten, Building Seismic Safety Council of the National Institute of Building Sciences, representing FEMA/BSSC Code Resource Support Committee

Revise as follows:

1708.5 (Supp) Seismic qualification certification of mechanical and electrical equipment nonstructural components. The registered design professional shall state the applicable seismic qualification certification requirements for nonstructural components and designated seismic systems on the construction documents. ~~Each~~

1. The manufacturer of each designated seismic system components subject to the provisions of ASCE 7 Section 13.2.2 shall test or analyze the component and its mounting system or anchorage and submit a certificate of compliance for review and acceptance by the registered design professional for the design of the designated seismic system and for approval by the building official. Qualification shall be by Certification shall be based on an actual test on a shake table, by three-dimensional shock tests, by an analytical method using dynamic characteristics and forces, by the use of experience data (i.e., historical data demonstrating acceptable seismic performance) or by a more rigorous analysis providing for equivalent safety.
2. Manufacturers certification of compliance for the general design requirements of ASCE 7 Section 13.2.1 shall be based on analysis, testing, or experience data.

Reason: This proposal clarifies the requirements for special certification of designated seismic systems, and clarifies the distinctions between seismic certification and special seismic certification. In ASCE 7, all nonstructural components must comply with general design provisions of Section 13.2.1, which permits justification of components by project-specific design or certification by the manufacturer (through analysis, testing, or experience data). Special certification is only required for active mechanical and electrical components that must remain operable following an earthquake, and components with hazardous contents. Obtaining this certification requires shake table testing or use of experience data. The term "seismic qualification" is replaced, since it does not apply.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: This code change clarifies the code requirement for seismic certification of designated seismic systems.

Assembly Action:

None

Final Hearing Results

S138-07/08

AS

Code Change No: S139-07/08

Original Proposal

Section: 1708.5

Proponent: Philip Brazil, PE, SE, Reid Middleton, Inc., representing himself

Revise as follows:

1708.5 (Supp) Seismic qualification of mechanical and electrical equipment. The registered design professional shall state the applicable seismic qualification requirements for designated seismic systems on the construction documents. Each manufacturer of designated seismic system components shall test or analyze the component and its mounting system or anchorage and submit a certificate of compliance for review and acceptance by the registered design professional responsible for the design of the designated seismic system and for approval by the building official. Qualification shall be by actual test on a shake table, by three-dimensional shock tests, by an analytical method using dynamic characteristics and forces, by the use of experience data (i.e., historical data demonstrating acceptable seismic performance) or by more rigorous analysis providing for equivalent safety.

Reason: The change is proposed for consistency with other instances in the IBC when a registered design professional's specific responsibilities are specified. This is also being proposed to correct an oversight on my part during development of Proposal S37-06/07-AM.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: This proposal provides consistency with other occurrences of the term registered design professional.

Assembly Action:

None

Final Hearing Results

S139-07/08

AS

Code Change No: **S140-07/08**

Original Proposal

Sections: 1709.2, [F] 903.3.5.2, 1802.2.6, 1802.2.7, 1805.5.1.3, 2306.4.2, 2306.4.3, 2306.4.4, 2306.4.5

Proponent: Philip Brazil, PE, SE, Reid Middleton, Inc., representing himself

Revise as follows:

[F] 903.3.5.2 Secondary water supply. A secondary on-site water supply equal to the hydraulically calculated sprinkler demand, including the hose stream requirement, shall be provided for high-rise buildings ~~in assigned to~~ Seismic Design Category C, D, E or F as determined by this code. The secondary water supply shall have a duration of not less than 30 minutes as determined by the occupancy hazard classification in accordance with NFPA 13.

Exception: Existing buildings.

1709.2 (Supp) Structural observations for seismic resistance. Structural observations shall be provided for those structures ~~included in assigned to~~ Seismic Design Category D, E or F, as determined in Section 1613, where one or more of the following conditions exist:

1. The structure is classified as Occupancy Category III or IV in accordance with Table 1604.5.
2. The height of the structure is greater than 75 feet (22 860 mm) above the base.
3. The structure is assigned to Seismic Design Category E, is classified as Occupancy Category I or II in accordance with Table 1604.5, and is greater than two stories above grade plane.
4. When so designated by the registered design professional responsible for the structural design.
5. When such observation is specifically required by the building official.

1802.2.6 Seismic Design Category C. Where a structure is ~~determined to be in assigned to~~ Seismic Design Category C in accordance with Section 1613, an investigation shall be conducted and shall include an evaluation of the following potential hazards resulting from earthquake motions: slope instability, liquefaction and surface rupture due to faulting or lateral spreading.

1802.2.7 Seismic Design Category D, E or F. Where the structure is ~~determined to be in assigned to~~ Seismic Design Category D, E or F, in accordance with Section 1613, the soils investigation requirements for Seismic Design Category C, given in Section 1802.2.6, shall be met, in addition to the following. The investigation shall include:

1. A determination of lateral pressures on basement and retaining walls due to earthquake motions.
2. An assessment of potential consequences of any liquefaction and soil strength loss, including estimation of differential settlement, lateral movement or reduction in foundation soil-bearing capacity, and shall address mitigation measures. Such measures shall be given consideration in the design of the structure and can include but are not limited to ground stabilization, selection of appropriate foundation type and depths, selection of appropriate structural systems to accommodate anticipated displacements or any combination of these measures. The potential for liquefaction and soil strength loss shall be evaluated for site peak ground acceleration magnitudes and source characteristics consistent with the design earthquake ground motions. Peak ground acceleration shall be determined from a site-specific study taking into account soil amplification effects, as specified in Chapter 21 of ASCE 7.

Exception: A site-specific study need not be performed, provided that peak ground acceleration equal to $SDS/2.5$ is used, where SDS is determined in accordance with Section 21.2.1 of ASCE 7.

1805.5.1.3 Rubble stone. Foundation walls of rough or random rubble stone shall not be less than 16 inches (406 mm) thick. Rubble stone shall not be used for foundations ~~for~~ of structures ~~in assigned to~~ Seismic Design Category C, D, E or F.

2306.4.2 (Supp) Lumber sheathed shear walls. Single and double diagonally sheathed lumber shear walls shall be designed and constructed in accordance with AF&PA SDPWS. Single and double diagonally sheathed lumber walls shall not be used to resist seismic ~~loads~~ forces in structures ~~in assigned to~~ Seismic Design Category E or F.

2306.4.3 (Supp) Particleboard shear walls. Particleboard shear walls shall be designed and constructed in accordance with AF&PA SDPWS. Particleboard shear walls shall be permitted to resist horizontal forces using the allowable shear capacities set forth in Table 2306.4.3. Allowable capacities in Table 2306.4.3 are permitted to be increased 40 percent for wind design. Particleboard shall not be used to resist seismic forces in structures ~~in~~ assigned to Seismic Design Category D, E or F.

2306.4.4 (Supp) Fiberboard shear walls. Fiberboard shear walls shall be designed and constructed in accordance with AF&PA SDPWS. Fiberboard shear walls are permitted to resist horizontal forces using the allowable shear capacities set forth in Table 2306.4.4. Allowable capacities in Table 2306.4.4 are permitted to be increased 40 percent for wind design. Fiberboard shall not be used to resist seismic forces in structures ~~in~~ assigned to Seismic Design Category D, E or F.

2306.4.5 (Supp) Shear walls sheathed with other materials. Shear walls sheathed with portland cement plaster, gypsum lath, gypsum sheathing, or gypsum board shall be designed and constructed in accordance with AF&PA SDPWS. Shear walls sheathed with these materials are permitted to resist horizontal forces using the allowable shear capacities set forth in Table 2306.4.5. Shear walls sheathed with portland cement plaster, gypsum lath, gypsum sheathing, or gypsum board shall not be used to resist seismic ~~loads~~ forces in structures ~~in~~ assigned to Seismic Design Category E or F.

Reason: The changes are proposed for consistency with the use of "assigned to" in conjunction with structures and Seismic Design Category elsewhere in the 2006 IBC (more than 60 code sections) and with Proposal S39-04/05-AM. The sections in the proposal contain the only such instances in the 2007 Supplement and 2006 IBC with respect to structures and Seismic Design Category that merit consideration by the Correlating Committee. Other instances should be modified through the code development process. In Sections 2306.4.2 and 2306.4.5, "seismic loads" is changed to "seismic forces" for consistency with use of the latter term throughout the IBC.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: This change is an editorial improvement that uses more accurate wording that is consistent with the earthquake provisions.

Assembly Action:

None

Final Hearing Results

S140-07/08

AS

Code Change No: **S145-07/08**

Original Proposal

Section: 1801.2.1

Proponent: Edwin T. Huston, Smith & Huston, Inc., representing National Council of Structural Engineering Associations

Revise as follows:

1801.2.1 Foundation design for seismic overturning. Where the foundation is proportioned using the load combinations of Section 1605.2 or 1605.3.1, and the computation of the seismic overturning moment is by the equivalent lateral-force method or the modal analysis method, the proportioning shall be in accordance with Section 12.13.4 of ASCE 7.

Reason: Code consistency. ASCE 7 permits the reduction of seismic overturning for foundation design where either strength design or allowable stress design load combinations are used. The load combinations of Sections 1605.2 and 1605.3.1 correspond to the two sets of ASCE 7 load combinations. Because the load combinations in Section 1605.3.2 include 0.9D where overturning is assessed (rather than 0.6D as in Section 1605.3.1), reduction of seismic overturning in accordance with Section 12.13.4 of ASCE 7 would be unconservative where those load combinations are used.

In a related proposal Section 1801.2.1 is moved to new Section 1808.3.1. If both proposals are approved this change should be made in the new section.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: This proposal improves consistency with the ASCE 7 standard when using allowable stress design.

Assembly Action:

None

Final Hearing Results

S145-07/08

AS

Code Change No: S146-07/08

Original Proposal

Sections: 106.1, 1610.1, 1802, 1803, 1805.3.5, 1808.2.2, 1808.2.8.4, 1808.2.10, 3304.1.4, Appendix J101.1, J104.3, J106.1, J107.1, J107.6

Proponent: Edwin T. Huston, Smith & Huston, Inc., representing the National Council of Structural Engineering Associations

Revise as follows:

106.1 (Supp) General. Submittal documents consisting of construction documents, statement of special inspections, geotechnical report and other data shall be submitted in one or more sets with each application for a permit. The construction documents shall be prepared by a registered design professional where required by the statutes of the jurisdiction in which the project is to be constructed. Where special conditions exist, the building official is authorized to require additional construction documents to be prepared by a registered design professional.

Exception: The building official is authorized to waive the submission of construction documents and other data not required to be prepared by a registered design professional if it is found that the nature of the work applied for is such that review of construction documents is not necessary to obtain compliance with this code.

1610.1 General. Basement, foundation and retaining walls shall be designed to resist lateral soil loads. Soil loads specified in Table 1610.1 shall be used as the minimum design lateral soil loads unless specified determined otherwise ~~in by a soil geotechnical investigation report approved by the building official in accordance with Section 1803.~~ Basement walls and other walls in which horizontal movement is restricted at the top shall be designed for at-rest pressure. Retaining walls free to move and rotate at the top ~~are~~ shall be permitted to be designed for active pressure. Design lateral pressure from surcharge loads shall be added to the lateral earth pressure load. Design lateral pressure shall be increased if soils with expansion potential are present at the site.

Exception: Basement walls extending not more than 8 feet (2438 mm) below grade and supporting flexible floor systems shall be permitted to be designed for active pressure.

**SECTION ~~1802~~ 1803
FOUNDATION AND SOILS GEOTECHNICAL INVESTIGATIONS**

~~1802.4~~ 1803.1 General. ~~Foundation and soils~~ Geotechnical investigations shall be conducted in ~~conformance~~ accordance with ~~Sections 1802.2 through 1802.6~~ Section 1803.2 and reported in accordance with Section 1803.6. Where required by the building official ~~the classification and investigation of the soil or where geotechnical investigations involve in-situ testing, laboratory testing, or engineering calculations, such investigations shall be made conducted~~ by a registered design professional.

~~1802.2 1803.2~~ **Where Investigations required.** ~~The owner or applicant shall submit a foundation and soils investigation to the building official where required in~~ Geotechnical investigations shall be conducted in accordance with Sections 1802.2.1 through 1802.2.7 1803.3 through 1803.5.

Exception: ~~The building official need not require~~ shall be permitted to waive the requirement for a foundation or soils geotechnical investigation where satisfactory data from adjacent areas is available that demonstrates an investigation is not necessary for any of the conditions in Sections 1802.2.1 through 1802.2.6 1803.5.1 through 1803.5.6 and Sections 1803.5.10 and 1803.5.11.

~~1802.3~~ **Soil classification.** ~~Where required, soils shall be classified in accordance with Section 1802.3.1 or 1802.3.2.~~

~~1802.4~~ **1803.3 Basis of investigation.** Soil classification shall be based on observation and any necessary tests of the materials disclosed by borings, test pits or other subsurface exploration made in appropriate locations. Additional studies shall be made as necessary to evaluate slope stability, soil strength, position and adequacy of load-bearing soils, the effect of moisture variation on soil-bearing capacity, compressibility, liquefaction and expansiveness.

~~1802.4.1~~ **1803.3.1 Exploratory boring Scope of investigation.** The scope of the ~~soil~~ geotechnical investigation including the number and types of borings or soundings, the equipment used to drill and or sample, the in-situ testing equipment and the laboratory testing program shall be determined by a registered design professional.

~~1802.5~~ **1803.4 Soil boring and sampling Qualified representative.** ~~The soil boring and sampling investigation procedure and apparatus shall be in accordance with generally accepted engineering practice. The registered design professional shall have a fully qualified representative on the site during all boring and or sampling operations.~~

1803.5 Investigated conditions. Geotechnical investigations shall be conducted as indicated in Sections 1803.5.1 through 1803.5.12.

~~1802.3.1~~ **1803.5.1 General Classification.** ~~For the purposes of this chapter, the definition and classification of Soil materials for use in Table 1804.2 shall be~~ classified in accordance with ASTM D 2487.

~~1802.2.1~~ **1803.5.2 Questionable soil.** ~~Where the classification, strength or compressibility of the soil is in doubt or where a load-bearing value superior to that specified in this code is claimed, the building official shall be permitted to require that the necessary a geotechnical investigation be made conducted. Such investigation shall comply with the provisions of Sections 1802.4 through 1802.6.~~

~~1802.2.2~~ **1803.5.3 Expansive soils soil.** In areas likely to have expansive soil, the building official shall require soil tests to determine where such soils do exist.

~~1802.3.2~~ **Expansive soils.** Soils meeting all four of the following provisions shall be considered expansive, except that tests to show compliance with Items 1, 2 and 3 shall not be required if the test prescribed in Item 4 is conducted:

1. Plasticity index (PI) of 15 or greater, determined in accordance with ASTM D 4318.
2. More than 10 percent of the soil particles pass a No. 200 sieve (75 μ m), determined in accordance with ASTM D 422.
3. More than 10 percent of the soil particles are less than 5 micrometers in size, determined in accordance with ASTM D 422.
4. Expansion index greater than 20, determined in accordance with ASTM D 4829.

~~1802.2.3~~ **1803.5.4 Ground-water table.** A subsurface soil investigation shall be performed to determine whether the existing ground-water table is above or within 5 feet (1524 mm) below the elevation of the lowest floor level where such floor is located below the finished ground level adjacent to the foundation.

Exception: A subsurface soil investigation to determine the location of the ground-water table shall not be required where waterproofing is provided in accordance with Section 1807.

~~1802.2.4~~ **1803.5.5 Deep Pile and pier foundations.** ~~Pile and pier foundations shall be designed and installed on the basis of a foundation investigation and report as specified in Sections 1802.4 through 1802.6 and Section 1808.2.1. Where deep foundations will be used, a geotechnical investigation shall be conducted and shall include all of the following, unless sufficient data upon which to base the design and installation is otherwise available:~~

1. Recommended deep foundation types and installed capacities.
2. Recommended center-to-center spacing of deep foundation elements.
3. Driving criteria.
4. Installation procedures.
5. Field inspection and reporting procedures (to include procedures for verification of the installed bearing capacity where required).
6. Load test requirements.
7. Suitability of deep foundation materials for the intended environment.
8. Designation of bearing stratum or strata.
9. Reductions for group action, where necessary.

1802.2.5 1803.5.6 Rock strata. Where subsurface explorations at the project site indicate variations or doubtful characteristics in the structure of the rock upon which foundations are to be constructed, a sufficient number of borings shall be made to a depth of not less than 10 feet (3048 mm) below the level of the foundations to provide assurance of the soundness of the foundation bed and its load-bearing capacity.

1803.5.7 Excavation near foundations. Where excavation will remove lateral support from any foundation, an investigation shall be conducted to assess the potential consequences and address mitigation measures.

1803.5.8 Compacted fill material. Where shallow foundations will bear on compacted fill material more than 12 inches (305 mm) in depth, a geotechnical investigation shall be conducted and shall include all of the following:

1. Specifications for the preparation of the site prior to placement of compacted fill material.
2. Specifications for material to be used as compacted fill.
3. Test methods to be used to determine the maximum dry density and optimum moisture content of the material to be used as compacted fill.
4. Maximum allowable thickness of each lift of compacted fill material.
5. Field test method for determining the in-place dry density of the compacted fill.
6. Minimum acceptable in-place dry density expressed as a percentage of the maximum dry density determined in accordance with Item 3.
7. Number and frequency of field tests required to determine compliance with Item 6.

1803.5.9 Controlled low-strength material (CLSM). Where shallow foundations will bear on controlled low-strength material (CLSM), a geotechnical investigation shall be conducted and shall include all of the following:

1. Specifications for the preparation of the site prior to placement of the CLSM.
2. Specifications for the CLSM.
3. Laboratory or field test method(s) to be used to determine the compressive strength or bearing capacity of the CLSM.
4. Test methods for determining the acceptance of the CLSM in the field.
5. Number and frequency of field tests required to determine compliance with Item 4.

1803.5.10 Alternate setback and clearance. Where setbacks or clearances other than those required in Section 1805.3 are desired, the building official shall be permitted to require a geotechnical investigation by a registered design professional to demonstrate that the intent of Section 1805.3 would be satisfied. Such an investigation shall include consideration of material, height of slope, slope gradient, load intensity and erosion characteristics of slope material.

1802.2.6 1803.5.11 Seismic Design Category Categories C through F. Where a For structures is determined assigned to be in Seismic Design Category C, D, E, or F in accordance with Section 1613, an a geotechnical investigation shall be conducted, and shall include an evaluation of all the following potential geologic and seismic hazards resulting from earthquake motions:

1. Slope instability.
2. Liquefaction.
3. Differential settlement. and
4. Surface rupture displacement due to faulting or lateral spreading.

1802.2.7 1803.5.12 Seismic Design Category Categories D, E or through F. Where the For structures is determined assigned to be in Seismic Design Category D, E or F, in accordance with Section 1613, the soils geotechnical investigation requirements for Seismic Design Category C, given in required by Section 1802.2.6 1803.5.11, shall be met, in addition to the following. The investigation shall also include:

1. ~~A~~The determination of lateral pressures on basement and retaining walls due to earthquake motions.
2. The potential for liquefaction and soil strength loss evaluated for site peak ground accelerations, magnitudes, and source characteristics consistent with the design earthquake ground motions. Peak ground acceleration shall be permitted to be determined based on a site-specific study taking into account soil amplification effects, as specified in Chapter 21 of ASCE 7, or, in the absence of such a study, peak ground accelerations shall be assumed equal to $S_{DS} / 2.5$, where S_{DS} is determined in accordance with Section 11.4 of ASCE 7.
3. An assessment of potential consequences of ~~any~~ liquefaction and soil strength loss, including estimation of differential settlement, lateral movement ~~or~~, lateral loads on foundations, reduction in foundation soil-bearing capacity, increases in lateral pressures on retaining walls and flotation of buried structures.
4. ~~and shall address Discussion of mitigation measures. Such measures shall be given consideration in the design of the structure and can include, but are such as, but not limited to, ground stabilization, selection of appropriate foundation type and depths, selection of appropriate structural systems to accommodate anticipated displacements and forces, or any combination of these measures and how they shall be considered in the design of the structure. The potential for liquefaction and soil strength loss shall be evaluated for site peak ground acceleration magnitudes and source characteristics consistent with the design earthquake ground motions. Peak ground acceleration shall be determined from a site-specific study taking into account soil amplification effects, as specified in Chapter 21 of ASCE 7.~~

~~**Exception:** A site-specific study need not be performed provided that peak ground acceleration equal to $S_{DS} / 2.5$ is used, where S_{DS} is determined in accordance with Section 21.2.1 of ASCE 7.~~

~~**4802-6 1803.6 Reports Reporting.** The soil classification and design load-bearing capacity shall be shown on the construction document. Where geotechnical investigations are required by the building official, a written report of the investigations shall be submitted that includes to the building official by the owner or authorized agent at the time of permit application. This geotechnical report shall include, but need not be limited to, the following information:~~

1. A plot showing the location of ~~test borings and/or excavations~~ the soil investigations.
2. A complete record of the soil boring and penetration test logs and soil samples.
3. A record of the soil profile.
4. Elevation of the water table, if encountered.
5. Recommendations for foundation type and design criteria, including but not limited to: bearing capacity of natural or compacted soil; provisions to mitigate the effects of expansive soils; mitigation of the effects of liquefaction, differential settlement and varying soil strength; and the effects of adjacent loads.
6. Expected total and differential settlement.
7. ~~Pile and pier~~ Deep foundation information in accordance with Section ~~4808.2-2~~ 1803.5.5.
8. Special design and construction provisions for ~~footings or~~ foundations of structures founded on expansive soils, as necessary.
9. Compacted fill material properties and testing in accordance with Section ~~4803.5~~ 1803.5.8.
10. Controlled low-strength material properties and testing in accordance with Section 1803.5.9.

SECTION 4803 1804 EXCAVATION, GRADING AND FILL

~~**4803-1 1804.1 Excavations Excavation near footings or foundations.** Excavations Excavation for any purpose shall not remove lateral support from any footing or foundation without first underpinning or protecting the footing or foundation against settlement or lateral translation.~~

~~**4803-2 1804.2 Placement of backfill.** The excavation outside the foundation shall be backfilled with soil that is free of organic material, construction debris, cobbles and boulders or with a controlled low-strength material (CLSM). The backfill shall be placed in lifts and compacted, in a manner that does not damage the foundation or the waterproofing or dampproofing material.~~

~~**Exception:** Controlled low-strength material need not be compacted.~~

~~**4803-3 1804.3 Site grading.** The ground immediately adjacent to the foundation shall be sloped away from the building at a slope of not less than one unit vertical in 20 units horizontal (5-percent slope) for a minimum distance of 10 feet (3048 mm) measured perpendicular to the face of the wall. If physical obstructions or lot lines prohibit 10 feet (3048 mm) of horizontal distance, a 5-percent slope shall be provided to an approved alternate method of diverting water away from the foundation. Swales used for this purpose shall be sloped a minimum of 2 percent where located within 10 feet (3048 mm) of the building foundation. Impervious surfaces within 10 feet (3048 mm) of the building foundation shall be sloped a minimum of 2 percent away from the building.~~

Exception: Where climatic or soil conditions warrant, the slope of the ground away from the building foundation ~~is~~ shall be permitted to be reduced to not less than one unit vertical in 48 units horizontal (2-percent slope).

The procedure used to establish the final ground level adjacent to the foundation shall account for additional settlement of the backfill.

1803.4 1804.4 Grading and fill in flood hazard areas. In flood hazard areas established in Section 1612.3, grading and/or fill shall not be approved:

1. Unless such fill is placed, compacted and sloped to minimize shifting, slumping and erosion during the rise and fall of floor water and, as applicable, wave action.
2. In floodways, unless it has been demonstrated through hydrologic and hydraulic analyses performed by a registered design professional in accordance with standard engineering practice that the proposed grading or fill, or both, will not result in any increase in flood levels during the occurrence of the design flood.
3. In flood hazard areas subject to high-velocity wave action, unless such fill is conducted and/or placed to avoid diversion of water and waves toward any building or structure.
4. Where design flood elevations are specified but floodways have not been designated, unless it has been demonstrated that the cumulative effect of the proposed floor hazard area encroachment, when combined with all other existing and anticipated floor hazard area encroachment, will not increase the design flood elevation more than one foot (305 mm) at any point.

1803.5 1804.5 Compacted fill material. Where ~~footings~~ shallow foundations will bear on compacted fill material, the compacted fill shall comply with the provisions of an approved geotechnical report, ~~which shall contain the following:~~ as set forth in Section 1803.

- ~~1. Specifications for the preparation of the site prior to placement of compacted fill material.~~
- ~~2. Specifications for material to be used as compacted fill.~~
- ~~3. Test method to be used to determine the maximum dry density and optimum moisture content of the material to be used as compacted fill.~~
- ~~4. Maximum allowable thickness of each lift of compacted fill material.~~
- ~~5. Field test method for determining the in-place dry density of the compacted fill.~~
- ~~6. Minimum acceptable in-place dry density expressed as a percentage of the maximum dry density determined in accordance with Item 3.~~
- ~~7. Number and frequency of field tests required to determine compliance with Item 6.~~

Exception: Compacted fill material less than 12 inches (305 mm) in depth need not comply with an approved report, provided it has been compacted to a minimum of 90 percent Modified Proctor in accordance with ASTM D 1557. The compaction shall be verified by a qualified inspector approved by the building official.

1803.6 1804.6 Controlled low-strength material (CLSM). Where ~~footings~~ shallow foundations will bear on controlled low-strength material (CLSM), the CLSM shall comply with the provisions of an approved geotechnical report, ~~which shall contain the following:~~ as set forth in Section 1803.

- ~~1. Specifications for the preparation of the site prior to placement of the CLSM.~~
- ~~2. Specifications for the CLSM.~~
- ~~3. Laboratory or field test method(s) to be used to determine the compressive strength or bearing capacity of the CLSM.~~
- ~~4. Test methods for determining the acceptance of the CLSM in the field.~~
- ~~5. Number and frequency of field tests required to determine compliance with Item 4.~~

1805.3.5 Alternate setback and clearance. Alternate setbacks and clearances are permitted, subject to the approval of the building official. The building official ~~is~~ shall be permitted to require an a geotechnical investigation and recommendation of a registered design professional to demonstrate that the intent of this section has been satisfied. Such an investigation shall include consideration of material, height of slope, slope gradient, load intensity and erosion characteristics of slope material as set forth in Section 1803.5.10.

1808.2.2 General. Pier and pile foundations shall be designed and installed on the basis of a foundation geotechnical investigation as defined set forth in Section ~~1802~~ 1803 ~~unless sufficient data upon which to base the design and installation is available.~~

~~The investigation and report provisions of Section 1802 shall be expanded to include, but not be limited to, the following:~~

1. ~~Recommended pier or pile types and installed capacities.~~
2. ~~Recommended center-to-center spacing of piers or piles.~~
3. ~~Driving criteria.~~
4. ~~Installation procedures.~~
5. ~~Field inspection and reporting procedures (to include procedures for verification of the installed bearing capacity where required).~~
6. ~~Pier or pile load test requirements.~~
7. ~~Durability of pier or pile materials.~~
8. ~~Designation of bearing stratum or strata.~~
9. ~~Reductions for group action, where necessary.~~

1808.2.8.4 Allowable frictional resistance. The assumed frictional resistance developed by any pier or uncased cast-in-place pile shall not exceed one-sixth of the bearing value of the soil material at minimum depth as set forth in Table 1804.2, up to a maximum of 500 psf (24 kPa), unless a greater value is allowed by the building official after a ~~soil~~ geotechnical investigation as specified in Section ~~4802~~ 1803 is submitted or a greater value is substantiated by a load test in accordance with Section 1808.2.8.3. Frictional resistance and bearing resistance shall not be assumed to act simultaneously unless ~~recommended~~ determined by a ~~soil~~ geotechnical investigation ~~as specified in accordance with~~ Section ~~4802~~ 1803.

1808.2.10 Use of higher allowable pier or pile stresses. Allowable stresses greater than those specified for piers or for each pile type in Sections 1809 and 1810 are permitted where supporting data justifying such higher stresses is filed with the building official. Such substantiating data shall include:

1. A ~~soils~~ geotechnical investigation in accordance with Section ~~4802~~ 1803.
2. Pier or pile load tests in accordance with Section 1808.2.8.3, regardless of the load supported by the pier or pile.

The design and installation of the pier or pile foundation shall be under the direct supervision of a registered design professional knowledgeable in the field of soil mechanics and pier or pile foundations who shall certify to the building official that the piers or piles as installed satisfy the design criteria.

3304.1.4 Fill supporting foundations. Fill to be used to support the foundations of any building or structure shall comply with Section ~~4803.5~~ 1804.5. Special inspections of compacted fill shall be in accordance with Section 1704.7.

J101.1 Scope. The provisions of this chapter apply to grading, excavation and earthwork construction, including fills and embankments. Where conflicts occur between the technical requirements of this chapter and the ~~soils~~ geotechnical report, the ~~soils~~ geotechnical report shall govern.

J104.3 Soils report. A ~~soils~~ geotechnical report prepared by a registered design ~~professionals~~ professional shall be provided ~~which~~. The report shall identify contain at least the following:

1. The nature and distribution of existing soils;
2. Conclusions and recommendations for grading procedures;
3. Soil design criteria for any structures or embankments required to accomplish the proposed grading; and
4. Where necessary, slope stability studies, and recommendations and conclusions regarding site geology.

Exception: A ~~soils~~ geotechnical report is not required where the building official determines that the nature of the work applied for is such that a report is not necessary.

J106.1 Maximum slope. The slope of cut surfaces shall be no steeper than is safe for the intended use, and shall be no steeper than 2 horizontal to 1 vertical (50 percent) unless the ~~applicant~~ owner or authorized agent furnishes a ~~soils~~ geotechnical report justifying a steeper slope.

Exceptions:

1. A cut surface may be at a slope of 1.5 horizontal to 1 vertical (67 percent) provided that all the following are met:
 - 1.1. It is not intended to support structures or surcharges.
 - 1.2. It is adequately protected against erosion.
 - 1.3. It is no more than 8 feet (2438 mm) in height.
 - 1.4. It is approved by the building official.
 - 1.5. Ground-water is not encountered.
2. A cut surface in bedrock shall be permitted to be at a slope of 1 horizontal to 1 vertical (100 percent).

J107.1 General. Unless otherwise recommended in the ~~soils~~ geotechnical report, fills shall comply with the ~~conform~~ to provisions of this section.

J107.6 Maximum slope. The slope of fill surfaces shall be no steeper than is safe for the intended use. Fill slopes steeper than 2 horizontal to 1 vertical (50 percent) shall be justified by ~~soils~~ a geotechnical report ~~reports~~ or engineering data.

Reason: Code update and clarification.

Reorganizes and clarifies the sections related to geotechnical investigations and excavation, grading and fill. Provides consistent use of “geotechnical” as related to investigations and reports.

Section 1802.1 allows the building official to require that investigations be conducted by a registered design professional (RDP), but does NOT allow the building official to remove such a requirement that appears elsewhere. Several sections of the code do require investigations by a RDP. The text of 1802.1 is revised to clarify those requirements. Section 1802.4.1 requires that a RDP establish the scope of investigations that involve borings and soundings, drilling and sampling, in-situ testing, and laboratory testing. Since the purpose of borings, soundings, drilling, and sampling is related to “in-situ testing, laboratory testing, or engineering calculations”, the scope is slightly revised by use of those terms in new Section 1803.1. Several sections outside 1802 set forth requirements for geotechnical investigations; those items are all collected and coordinated in this proposal.

Where excavation will remove lateral support for a foundation, current Section 1803.1 requires underpinning or protection against settlement or lateral translation. In practice, compliance requires a geotechnical investigation. Section 1803.5.7 is added to reflect that reality.

The addition of a tenth item in the section on reporting relates to an item that already requires investigation.

The requirements related to seismic design categories are recast (and slightly revised) for better agreement with Section 11.8.2 and 11.8.3 of ASCE 7-05.

The change is made to Section J106.1 because cuts below the ground-water table are less stable than those above.

Bibliography:

Composite of Chapter 18 reorganization assuming all of proponent’s proposals are approved.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Errata: Replace the entire proposal with the following:

Revise as follows:

106.1 [Supp] General. Submittal documents consisting of construction documents, statement of special inspections, geotechnical report and other data shall be submitted in one or more sets with each application for a permit. The construction documents shall be prepared by a registered design professional where required by the statutes of the jurisdiction in which the project is to be constructed. Where special conditions exist, the building official is authorized to require additional construction documents to be prepared by a registered design professional.

Exception: The building official is authorized to waive the submission of construction documents and other data not required to be prepared by a registered design professional if it is found that the nature of the work applied for is such that review of construction documents is not necessary to obtain compliance with this code.

1610.1 General. Basement, foundation and retaining walls shall be designed to resist lateral soil loads. Soil loads specified in Table 1610.1 shall be used as the minimum design lateral soil loads unless ~~specified determined~~ otherwise in by a soil geotechnical investigation report approved by the building official in accordance with Section 1803. Basement walls and other walls in which horizontal movement is restricted at the top shall be designed for at-rest pressure. Retaining walls free to move and rotate at the top ~~are~~ shall be permitted to be designed for active pressure. Design lateral pressure from surcharge loads shall be added to the lateral earth pressure load. Design lateral pressure shall be increased if soils with expansion potential are present at the site.

Exception: Basement walls extending not more than 8 feet (2438 mm) below grade and supporting flexible floor systems shall be permitted to be designed for active pressure.

**SECTION ~~1802~~ 1803
FOUNDATION AND SOILS GEOTECHNICAL INVESTIGATIONS**

~~1802.1~~ **1803.1 General.** ~~Foundation and soils~~ Geotechnical investigations shall be conducted in ~~conformance~~ accordance with ~~Sections 1802.2 through 1802.6~~ Section 1803.2 and reported in accordance with Section 1803.6. Where required by the building official ~~the classification and investigation of the soil or where geotechnical investigations involve in-situ testing, laboratory testing, or engineering calculations, such investigations shall be made~~ conducted by a registered design professional.

~~1802.2~~ **1803.2 Where investigations required.** ~~The owner or applicant shall submit a foundation and soils investigation to the building official where required in~~ Geotechnical investigations shall be conducted in accordance with ~~Sections 1802.2.1 through 1802.2.7~~ 1803.3 through 1803.5.

Exception: The building official ~~need not require~~ shall be permitted to waive the requirement for a foundation or soils geotechnical-investigation where satisfactory data from adjacent areas is available that demonstrates an investigation is not necessary for any of the conditions in ~~Sections 1802.2.1 through 1802.2.6~~ 1803.5.1 through 1803.5.6 and Sections 1803.5.10 and 1803.5.11.

~~1802.3~~ **Soil classification.** Where required, soils shall be classified in accordance with ~~Section 1802.3.1 or 1802.3.2~~.

~~1802.4~~ **1803.3 Basis of investigation.** Soil classification shall be based on observation and any necessary tests of the materials disclosed by borings, test pits or other subsurface exploration made in appropriate locations. Additional studies shall be made as necessary to evaluate slope stability, soil strength, position and adequacy of load-bearing soils, the effect of moisture variation on soil-bearing capacity, compressibility, liquefaction and expansiveness.

1802.4.1 1803.3.1 Exploratory boring Scope of investigation. The scope of the soil geotechnical investigation including the number and types of borings or soundings, the equipment used to drill and/or sample, the in-situ testing equipment and the laboratory testing program shall be determined by a registered design professional.

1802.5 1803.4 Soil boring and sampling Qualified representative. The soil boring and sampling investigation procedure and apparatus shall be in accordance with generally accepted engineering practice. The registered design professional shall have a fully qualified representative on the site during all boring and/or sampling operations.

1803.5 Investigated conditions. Geotechnical investigations shall be conducted as indicated in Sections 1803.5.1 through 1803.5.12.

1802.3.1 1803.5.1 General Classification. For the purposes of this chapter, the definition and classification of Soil materials for use in Table 4804.2 shall be classified in accordance with ASTM D 2487.

1802.2.1 1803.5.2 Questionable soil. Where the classification, strength or compressibility of the soil is in doubt or where a load-bearing value superior to that specified in this code is claimed, the building official shall be permitted to require that the necessary a geotechnical investigation be made conducted. Such investigation shall comply with the provisions of Sections 1802.4 through 1802.6.

1802.2.2 1803.5.3 Expansive soils soil. In areas likely to have expansive soil, the building official shall require soil tests to determine where such soils do exist.

1802.3.2 Expansive soils. Soils meeting all four of the following provisions shall be considered expansive, except that tests to show compliance with Items 1, 2 and 3 shall not be required if the test prescribed in Item 4 is conducted:

1. Plasticity index (PI) of 15 or greater, determined in accordance with ASTM D 4318.
2. More than 10 percent of the soil particles pass a No. 200 sieve (75 µm), determined in accordance with ASTM D 422.
3. More than 10 percent of the soil particles are less than 5 micrometers in size, determined in accordance with ASTM D 422.
4. Expansion index greater than 20, determined in accordance with ASTM D 4829.

1802.2.3 1803.5.4 Ground-water table. A subsurface soil investigation shall be performed to determine whether the existing ground-water table is above or within 5 feet (1524 mm) below the elevation of the lowest floor level where such floor is located below the finished ground level adjacent to the foundation.

Exception: A subsurface soil investigation to determine the location of the ground-water table shall not be required where waterproofing is provided in accordance with Section 1807.

1802.2.4 1803.5.5 Deep Pile and pier foundations. Pile and pier foundations shall be designed and installed on the basis of a foundation investigation and report as specified in Sections 1802.4 through 1802.6 and Section 1808.2.1. Where deep foundations will be used, a geotechnical investigation shall be conducted and shall include all of the following, unless sufficient data upon which to base the design and installation is otherwise available:

1. Recommended deep foundation types and installed capacities.
2. Recommended center-to-center spacing of deep foundation elements.
3. Driving criteria.
4. Installation procedures.
5. Field inspection and reporting procedures (to include procedures for verification of the installed bearing capacity where required).
6. Load test requirements.
7. Suitability of deep foundation materials for the intended environment.
8. Designation of bearing stratum or strata.
9. Reductions for group action, where necessary.

1802.2.5 1803.5.6 Rock strata. Where subsurface explorations at the project site indicate variations or doubtful characteristics in the structure of the rock upon which foundations are to be constructed, a sufficient number of borings shall be made to a depth of not less than 10 feet (3048 mm) below the level of the foundations to provide assurance of the soundness of the foundation bed and its load-bearing capacity.

1803.5.7 Excavation near foundations. Where excavation will remove lateral support from any foundation, an investigation shall be conducted to assess the potential consequences and address mitigation measures.

1803.5.8 Compacted fill material. Where shallow foundations will bear on compacted fill material more than 12 inches (305 mm) in depth, a geotechnical investigation shall be conducted and shall include all of the following:

1. Specifications for the preparation of the site prior to placement of compacted fill material.
2. Specifications for material to be used as compacted fill.
3. Test methods to be used to determine the maximum dry density and optimum moisture content of the material to be used as compacted fill.
4. Maximum allowable thickness of each lift of compacted fill material.
5. Field test method for determining the in-place dry density of the compacted fill.
6. Minimum acceptable in-place dry density expressed as a percentage of the maximum dry density determined in accordance with Item 3.
7. Number and frequency of field tests required to determine compliance with Item 6.

1803.5.9 Controlled low-strength material (CLSM). Where shallow foundations will bear on controlled low-strength material (CLSM), a geotechnical investigation shall be conducted and shall include all of the following:

1. Specifications for the preparation of the site prior to placement of the CLSM.
2. Specifications for the CLSM.
3. Laboratory or field test method(s) to be used to determine the compressive strength or bearing capacity of the CLSM.
4. Test methods for determining the acceptance of the CLSM in the field.
5. Number and frequency of field tests required to determine compliance with Item 4.

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1803.5.10 Alternate setback and clearance. Where setbacks or clearances other than those required in Section 1805.3 are desired, the building official shall be permitted to require a geotechnical investigation by a registered design professional to demonstrate that the intent of Section 1805.3 would be satisfied. Such an investigation shall include consideration of material, height of slope, slope gradient, load intensity and erosion characteristics of slope material.

1802.2.6 1803.5.11 Seismic Design Category Categories C through F. Where a For structures is determined assigned to be in Seismic Design Category C, D, E, or F in accordance with Section 1613, an a geotechnical investigation shall be conducted, and shall include an evaluation of all the following potential geologic and seismic hazards resulting from earthquake motions:

1. Slope instability.
2. Liquefaction.
3. Differential settlement. and
4. Surface rupture displacement due to faulting or lateral spreading.

1802.2.7 1803.5.12 Seismic Design Category Categories D, E or through F. Where the For structures is determined assigned to be in Seismic Design Category D, E or F; in accordance with Section 1613, the soils geotechnical investigation requirements for Seismic Design Category C, given in required by Section 1802.2.6 1803.5.11, shall be met, in addition to the following. The investigation shall also include:

1. A-The determination of lateral pressures on basement and retaining walls due to earthquake motions.
2. The potential for liquefaction and soil strength loss evaluated for site peak ground accelerations, magnitudes, and source characteristics consistent with the design earthquake ground motions. Peak ground acceleration shall be permitted to be determined based on a site-specific study taking into account soil amplification effects, as specified in Chapter 21 of ASCE 7, or, in the absence of such a study, peak ground accelerations shall be assumed equal to $S_{DS}/2.5$, where S_{DS} is determined in accordance with Section 11.4 of ASCE 7.
3. An assessment of potential consequences of any liquefaction and soil strength loss, including estimation of differential settlement, lateral movement or lateral loads on foundations, reduction in foundation soil-bearing capacity, increases in lateral pressures on retaining walls and flotation of buried structures.
4. and shall address Discussion of mitigation measures. Such measures shall be given consideration in the design of the structure and can include, but are such as, but not limited to, ground stabilization, selection of appropriate foundation type and depths, selection of appropriate structural systems to accommodate anticipated displacements and forces, or any combination of these measures and how they shall be considered in the design of the structure. The potential for liquefaction and soil strength loss shall be evaluated for site peak ground acceleration magnitudes and source characteristics consistent with the design earthquake ground motions. Peak ground acceleration shall be determined from a site-specific study taking into account soil amplification effects, as specified in Chapter 21 of ASCE 7.

Exception: A site-specific study need not be performed provided that peak ground acceleration equal to $S_{DS}/2.5$ is used, where S_{DS} is determined in accordance with Section 21.2.1 of ASCE 7.

1802.6 1803.6 Reports Reporting. The soil classification and design load-bearing capacity shall be shown on the construction document. Where geotechnical investigations are required by the building official, a written report of the investigations shall be submitted that includes to the building official by the owner or authorized agent at the time of permit application. This geotechnical report shall include, but need not be limited to, the following information:

1. A plot showing the location of test borings and/or excavations the soil investigations.
2. A complete record of the soil boring and penetration test logs and soil samples.
3. A record of the soil profile.
4. Elevation of the water table, if encountered.
5. Recommendations for foundation type and design criteria, including but not limited to: bearing capacity of natural or compacted soil; provisions to mitigate the effects of expansive soils; mitigation of the effects of liquefaction, differential settlement and varying soil strength; and the effects of adjacent loads.
6. Expected total and differential settlement.
7. Pile and pier Deep foundation information in accordance with Section 4808.2.2 1803.5.5.
8. Special design and construction provisions for footings or foundations of structures founded on expansive soils, as necessary.
9. Compacted fill material properties and testing in accordance with Section 4803.5 1803.5.8.
10. Controlled low-strength material properties and testing in accordance with Section 1803.5.9.

SECTION 4803 1804 EXCAVATION, GRADING AND FILL

1803.4 1804.1 Excavations Excavation near footings or foundations. Excavations Excavation for any purpose shall not remove lateral support from any footing or foundation without first underpinning or protecting the footing or foundation against settlement or lateral translation.

1803.2 1804.2 Placement of backfill. The excavation outside the foundation shall be backfilled with soil that is free of organic material, construction debris, cobbles and boulders or with a controlled low-strength material (CLSM). The backfill shall be placed in lifts and compacted, in a manner that does not damage the foundation or the waterproofing or dampproofing material.

Exception: Controlled low-strength material need not be compacted.

1803.3 1804.3 Site grading. The ground immediately adjacent to the foundation shall be sloped away from the building at a slope of not less than one unit vertical in 20 units horizontal (5-percent slope) for a minimum distance of 10 feet (3048 mm) measured perpendicular to the face of the wall. If physical obstructions or lot lines prohibit 10 feet (3048 mm) of horizontal distance, a 5-percent slope shall be provided to an approved alternate method of diverting water away from the foundation. Swales used for this purpose shall be sloped a minimum of 2 percent where located within 10 feet (3048 mm) of the building foundation. Impervious surfaces within 10 feet (3048 mm) of the building foundation shall be sloped a minimum of 2 percent away from the building.

Exception: Where climatic or soil conditions warrant, the slope of the ground away from the building foundation is shall be permitted to be reduced to not less than one unit vertical in 48 units horizontal (2-percent slope).

The procedure used to establish the final ground level adjacent to the foundation shall account for additional settlement of the backfill.

1803.4 1804.4 Grading and fill in flood hazard areas. In flood hazard areas established in Section 1612.3, grading and/or fill shall not be approved:

1. Unless such fill is placed, compacted and sloped to minimize shifting, slumping and erosion during the rise and fall of floor water and, as applicable, wave action.
2. In floodways, unless it has been demonstrated through hydrologic and hydraulic analyses performed by a registered design professional in accordance with standard engineering practice that the proposed grading or fill, or both, will not result in any increase in flood levels during the occurrence of the design flood.
3. In flood hazard areas subject to high-velocity wave action, unless such fill is conducted and/or placed to avoid diversion of water and waves toward any building or structure.
4. Where design flood elevations are specified but floodways have not been designated, unless it has been demonstrated that the cumulative effect of the proposed flood hazard area encroachment, when combined with all other existing and anticipated flood hazard area encroachment, will not increase the design flood elevation more than one foot (305 mm) at any point.

1803.5 1804.5 Compacted fill material. Where ~~footings shallow foundations~~ will bear on compacted fill material, the compacted fill shall comply with the provisions of an approved geotechnical report, which shall contain the following: as set forth in Section 1803.

1. ~~Specifications for the preparation of the site prior to placement of compacted fill material.~~
2. ~~Specifications for material to be used as compacted fill.~~
3. ~~Test method to be used to determine the maximum dry density and optimum moisture content of the material to be used as compacted fill.~~
4. ~~Maximum allowable thickness of each lift of compacted fill material.~~
5. ~~Field test method for determining the in-place dry density of the compacted fill.~~
6. ~~Minimum acceptable in-place dry density expressed as a percentage of the maximum dry density determined in accordance with Item 3.~~
7. ~~Number and frequency of field tests required to determine compliance with Item 6.~~

Exception: Compacted fill material less than 12 inches (305 mm) in depth need not comply with an approved report, provided it has been compacted to a minimum of 90 percent Modified Proctor in accordance with ASTM D 1557. The compaction shall be verified by a qualified inspector approved by the building official.

1803.6 1804.6 Controlled low-strength material (CLSM). Where ~~footings shallow foundations~~ will bear on controlled low-strength material (CLSM), the CLSM shall comply with the provisions of an approved geotechnical report, which shall contain the following: as set forth in Section 1803.

1. ~~Specifications for the preparation of the site prior to placement of the CLSM.~~
2. ~~Specifications for the CLSM.~~
3. ~~Laboratory or field test method(s) to be used to determine the compressive strength or bearing capacity of the CLSM.~~
4. ~~Test methods for determining the acceptance of the CLSM in the field.~~
5. ~~Number and frequency of field tests required to determine compliance with Item 4.~~

1805.3.5 Alternate setback and clearance. Alternate setbacks and clearances are permitted, subject to the approval of the building official. The building official is shall be permitted to require an geotechnical investigation and recommendation of a registered design professional to demonstrate that the intent of this section has been satisfied. Such an investigation shall include consideration of material, height of slope, slope gradient, load intensity and erosion characteristics of slope material as set forth in Section 1803.5.10.

1808.2.2 General. Pier and pile foundations shall be designed and installed on the basis of a foundation geotechnical investigation as defined set forth in Section 1802 1803 unless sufficient data upon which to base the design and installation is available.

The investigation and report provisions of Section 1802 shall be expanded to include, but not be limited to, the following:

1. ~~Recommended pier or pile types and installed capacities.~~
2. ~~Recommended center-to-center spacing of piers or piles.~~
3. ~~Driving criteria.~~
4. ~~Installation procedures.~~
5. ~~Field inspection and reporting procedures (to include procedures for verification of the installed bearing capacity where required).~~
6. ~~Pier or pile load test requirements.~~
7. ~~Durability of pier or pile materials.~~
8. ~~Designation of bearing stratum or strata.~~
9. ~~Reductions for group action, where necessary.~~

1808.2.8.4 Allowable frictional resistance. The assumed frictional resistance developed by any pier or uncased cast-in-place pile shall not exceed one-sixth of the bearing value of the soil material at minimum depth as set forth in Table 1804.2, up to a maximum of 500 psf (24 kPa), unless a greater value is allowed by the building official after a ~~soil geotechnical~~ investigation as specified in Section ~~1802 1803~~ is submitted or a greater value is substantiated by a load test in accordance with Section 1808.2.8.3. Frictional resistance and bearing resistance shall not be assumed to act simultaneously unless ~~recommended determined~~ by a soil geotechnical investigation as specified in accordance with Section 1802 1803.

1808.2.10 Use of higher allowable pier or pile stresses. Allowable stresses greater than those specified for piers or for each pile type in Sections 1809 and 1810 are permitted where supporting data justifying such higher stresses is filed with the building official. Such substantiating data shall include:

1. A ~~soils geotechnical~~ investigation in accordance with Section ~~1802 1803~~.
2. Pier or pile load tests in accordance with Section 1808.2.8.3, regardless of the load supported by the pier or pile.

The design and installation of the pier or pile foundation shall be under the direct supervision of a registered design professional knowledgeable in the field of soil mechanics and pier or pile foundations who shall certify to the building official that the piers or piles as installed satisfy the design criteria.

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3304.1.4 Fill supporting foundations. Fill to be used to support the foundations of any building or structure shall comply with Section ~~4803.5~~ 1804.5. Special inspections of compacted fill shall be in accordance with Section 1704.7.

J101.1 Scope. The provisions of this chapter apply to grading, excavation and earthwork construction, including fills and embankments. Where conflicts occur between the technical requirements of this chapter and the ~~soils~~ geotechnical report, the ~~soils~~ geotechnical report shall govern.

J104.3 Soils report. A ~~soils~~ geotechnical report prepared by a registered design ~~professionals~~ professional shall be provided ~~which~~. The report shall identify contain at least the following:

1. The nature and distribution of existing soils;
2. Conclusions and recommendations for grading procedures;
3. Soil design criteria for any structures or embankments required to accomplish the proposed grading; and
4. Where necessary, slope stability studies, and recommendations and conclusions regarding site geology.

Exception: A ~~soils~~ geotechnical report is not required where the building official determines that the nature of the work applied for is such that a report is not necessary.

J106.1 Maximum slope. The slope of cut surfaces shall be no steeper than is safe for the intended use, and shall be no steeper than 2 horizontal to 1 vertical (50 percent) unless the ~~applicant~~ owner or authorized agent furnishes a ~~soils~~ geotechnical report justifying a steeper slope.

Exceptions:

1. A cut surface may be at a slope of 1.5 horizontal to 1 vertical (67 percent) provided that all the following are met:
 - 1.1. It is not intended to support structures or surcharges.
 - 1.2. It is adequately protected against erosion.
 - 1.3. It is no more than 8 feet (2438 mm) in height.
 - 1.4. It is approved by the building official.
 - 1.5. Ground-water is not encountered.
2. A cut surface in bedrock shall be permitted to be at a slope of 1 horizontal to 1 vertical (100 percent).

J107.1 General. Unless otherwise recommended in the ~~soils~~ geotechnical report, fills shall ~~conform to~~ comply with the provisions of this section.

J107.6 Maximum slope. The slope of fill surfaces shall be no steeper than is safe for the intended use. Fill slopes steeper than 2 horizontal to 1 vertical (50 percent) shall be justified by ~~soils reports~~ a geotechnical report or engineering data.

Committee Action:

Approved as Modified

Modify proposal as follows:

1803.5.4 Ground-water table. A subsurface soil investigation shall be performed to determine whether the existing ground-water table is above or within 5 feet (1524 mm) below the elevation of the lowest floor level where such floor is located below the finished ground level adjacent to the foundation.

Exception: A subsurface soil investigation to determine the location of the ground-water table shall not be required where waterproofing is provided in accordance with Section ~~4807~~ 1805.

1803.5.10 Alternate setback and clearance. Where setbacks or clearances other than those required in Section ~~4805.3~~ 1808.7 are desired, the building official shall be permitted to require a geotechnical investigation by a registered design professional to demonstrate that the intent of Section ~~4805.3~~ 1808.7 would be satisfied. Such an investigation shall include consideration of material, height of slope, slope gradient, load intensity and erosion characteristics of slope material.

1803.5.12 Seismic Design Categories D through F. For structures assigned to Seismic Design Category D, E or F in accordance with Section 1613, the geotechnical investigation required by Section 1803.5.11 shall also include:

1. The determination of lateral pressures on ~~basement~~ foundation walls and retaining walls due to earthquake motions.
2. The potential for liquefaction and soil strength loss evaluated for site peak ground accelerations, magnitudes, and source characteristics consistent with the design earthquake ground motions. Peak ground acceleration shall be permitted to be determined based on a site-specific study taking into account soil amplification effects, as specified in Chapter 21 of ASCE 7, or, in the absence of such a study, peak ground accelerations shall be assumed equal to $S_{DS} / 2.5$, where S_{DS} is determined in accordance with Section 11.4 of ASCE 7.
3. An assessment of potential consequences of liquefaction and soil strength loss, including estimation of differential settlement, lateral movement, lateral loads on foundations, reduction in foundation soil-bearing capacity, increases in lateral pressures on retaining walls and flotation of buried structures.
4. Discussion of mitigation measures such as, but not limited to, ground stabilization, selection of appropriate foundation type and depths, selection of appropriate structural systems to accommodate anticipated displacements and forces, or any combination of these measures and how they shall be considered in the design of the structure.

(Portions of proposal not shown remain unchanged)

Committee Reason: This proposal improves the code by removing redundancy and reorganizing the Chapter 18 provisions. The modification corrects section references to correlate with other approved changes and provides an editorial change to foundation walls for consistency in terminology.

Assembly Action:

None

Final Hearing Results

S146-07/08

AM

Code Change No: **S147-07/08**

Original Proposal

Sections: 1804, 1804.1, 1804.2, Table 1804.2, 1804.3, 1804.3.1, 1806.3.2, 1806.3.3, 1806.3.4

Proponent: Edwin T. Huston, Smith & Huston, Inc., representing the National Council of Structural Engineering Associations

Revise as follows:

SECTION ~~1804~~ 1806 **ALLOWABLE PRESUMPTIVE LOAD-BEARING VALUES OF SOILS**

~~1804.1 Design.~~ **1806.1 Load combinations.** The presumptive load-bearing values provided in Table ~~1804.2~~ 1806.2 shall be used with the allowable stress design load combinations specified in Section 1605.3. The values of vertical foundation pressure and lateral bearing pressure given in Table 1806.2 shall be permitted to be increased by one-third where used with the alternative basic load combinations of Section 1605.3.2 that include wind or earthquake loads.

~~1804.2~~ **1806.2 Presumptive load-bearing values.** ~~The maximum allowable foundation pressure, lateral pressure or lateral sliding resistance load-bearing values used in design for supporting soils near the surface shall not exceed the values specified in Table 1804.2 1806.2 unless data to substantiate the use of a higher value values are submitted and approved. Where the building official has reason to doubt the classification, strength, or compressibility of the soil, the requirements of Section 1802.2.1 shall be satisfied.~~

Presumptive load-bearing values shall apply to materials with similar physical characteristics and dispositions. Mud, organic silt, organic clays, peat or unprepared fill shall not be assumed to have a presumptive load-bearing capacity unless data to substantiate the use of such a value are submitted.

Exception: A presumptive load-bearing capacity ~~is~~ shall be permitted to be used where the building official deems the load-bearing capacity of mud, organic silt or unprepared fill is adequate for the support of lightweight ~~and~~ or temporary structures.

TABLE ~~1804.2~~ 1806.2
ALLOWABLE FOUNDATION AND LATERAL PRESSURE
PRESUMPTIVE LOAD-BEARING VALUES

CLASS OF MATERIALS	ALLOWABLE VERTICAL FOUNDATION PRESSURE (psf) ^d	LATERAL BEARING PRESSURE (psf/f below natural grade) ^d	LATERAL SLIDING RESISTANCE	
			Coefficient of friction ^a	Cohesion Resistance (psf) ^b
1. Crystalline bedrock	12,000	1,200	0.70	—
2. Sedimentary and foliated rock	4,000	400	0.35	—
3. Sandy gravel and/or gravel (GW and GP)	3,000	200	0.35	—
4. Sand, silty sand, clayey sand, silty gravel and clayey gravel (SW, SP, SM, SC, GM and GC)	2,000	150	0.25	—
5. Clay, sandy clay, silty clay, clayey silt, silt and sandy silt (CL, ML, MH and CH)	1,500 ^e	100	—	130

For SI: 1 pound per square foot = 0.0479 kPa, 1 pound per square foot per foot = 0.157 kPa/m.

a. Coefficient to be multiplied by the dead load.

b. ~~Lateral sliding resistance~~ Cohesion value to be multiplied by the contact area, as limited by Section ~~1806.3.2~~ 1804.3.

- ~~e. Where the building official determines that in-place soils with an allowable bearing capacity of less than 1,500 psf are likely to be present at the site, the allowable bearing capacity shall be determined by a soils investigation.~~
~~d. An increase of one-third is permitted when using the alternate load combinations in Section 1605.3.2 that include wind or earthquake loads.~~

1804.3 1806.3 Lateral sliding load resistance. Where the presumptive values of Table 1806.2 are used to determine resistance to lateral loads, the calculations shall be in accordance with Sections 1806.3.1 through 1806.3.4.

1806.3.1 Combined resistance. The total resistance of structural walls to lateral loads sliding shall be permitted to be determined calculated by combining the values derived from the lateral bearing pressure and the lateral sliding resistance specified shown in Table 1804.2 1806.2 unless data to substantiate the use of higher values are submitted for approval.

1806.3.2 Lateral sliding resistance limit. For clay, sandy clay, silty clay, and clayey silt, silt and sandy silt, in no case shall the lateral sliding resistance exceed one-half the dead load.

~~**1804.3.1 Increases in allowable lateral sliding resistance.** The resistance values derived from the table are~~
1806.3.3 Increase for depth. The lateral bearing pressures specified in Table 1806.2 shall be permitted to be increased by the tabular value for each additional foot (305 mm) of depth to a maximum of 15 times the tabular value.

1806.3.4 Increase for poles. Isolated poles for uses such as flagpoles or signs and poles used to support buildings that are not adversely affected by a 0.5 inch (12.7 mm) motion at the ground surface due to short-term lateral wind or earthquake loads are shall be permitted to be designed using lateral bearing values lateral bearing pressures equal to two times the tabular values.

Reason: Code clarification. Changes are editorial. Moves the footnote (d) concerning load combinations to the introductory section with the same scope. Recasts the content of footnote c by referring to the broader requirement in Section 1802.2.1. Makes the terminology more consistent throughout the section. Removes the unnecessary text concerning substantiation of higher values, which is already covered in Section 1802.2.1 and new Section 1806.2. Fixes the apparent oversight of two soil types that appear in item 5 of the table for the list in the section limiting lateral sliding resistance. Clarifies that “short-term lateral loads” are “wind or earthquake loads”.

Bibliography:

Composite of Chapter 18 reorganization assuming all of proponent’s proposals are approved.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Errata: Revise Exception to Section 1804.2 as follows:

Exception: A presumptive load-bearing capacity ~~is~~ shall be permitted to be used where the building official deems the load-bearing capacity of mud, organic silt or unprepared fill is adequate for the support of lightweight ~~and~~ or temporary structures.

Committee Action:

Approved as Modified

Modify proposal as follows:

1806.2 Presumptive load-bearing values. The load-bearing values used in design for supporting soils near the surface shall not exceed the values specified in Table 1806.2 unless data to substantiate the use of higher values are submitted and approved. Where the building official has reason to doubt the classification, strength, or compressibility of the soil, the requirements of Section ~~1802.2.4~~ 1803.5.2 shall be satisfied.

Presumptive load-bearing values shall apply to materials with similar physical characteristics and dispositions. Mud, organic silt, organic clays, peat or unprepared fill shall not be assumed to have a presumptive load-bearing capacity unless data to substantiate the use of such a value are submitted.

Exception: A presumptive load-bearing capacity shall be permitted to be used where the building official deems the load-bearing capacity of mud, organic silt or unprepared fill is adequate for the support of lightweight or temporary structures.

1806.3.4 Increase for poles. Isolated poles for uses such as flagpoles or signs and poles used to support buildings that are not adversely affected by a 0.5 inch (12.7 mm) motion at the ground surface due to ~~wind or earthquake~~ short-term lateral loads shall be permitted to be designed using lateral bearing pressures equal to two times the tabular values.

(Portions of proposal not shown remain unchanged)

Committee Reason: This code change makes editorial changes that provide clarification of the current requirements. The modification correlates section references with other approved code changes and reinstates the original wording “short term lateral” loads which was more general than had been proposed.

Assembly Action:

None

Final Hearing Results

S147-07/08

AM

Code Change No: **S149-07/08**

Original Proposal

Sections: 1610, 1807 (New), 1805.5.2, 1805.5.4, 1805.5.5, 1805.6

Proponent: Edwin T. Huston, Smith & Huston, Inc., representing National Council of Structural Engineering Associations

1. Revise as follows:

1610.1 General. ~~Basement~~ Foundation walls and retaining walls shall be designed to resist lateral soil loads. Soil loads specified in Table 1610.1 shall be used as the minimum design lateral soil loads unless specified otherwise in a soil investigation report approved by the building official. ~~Basement~~ Foundation walls and other walls in which horizontal movement is restricted at the top shall be designed for at-rest pressure. Retaining walls free to move and rotate at the top ~~are shall be~~ permitted to be designed for active pressure. Design lateral pressure from surcharge loads shall be added to the lateral earth pressure load. Design lateral pressure shall be increased if soils ~~with expansion potential are present at the site~~ at the site are expansive. Foundation walls shall be designed to support the weight of the full hydrostatic pressure of undrained backfill unless a drainage system is installed in accordance with Sections 1807.4.2 and 1807.4.3.

Exception: ~~Basement~~ Foundation walls extending not more than 8 feet (2438 mm) below grade and ~~supporting laterally supported at the top by flexible floor systems~~ diaphragms shall be permitted to be designed for active pressure.

TABLE 1610.1
SOIL LATERAL SOIL LOAD

DESCRIPTION OF BACKFILL MATERIAL ^c	UNIFIED SOIL CLASSIFICATION	DESIGN LATERAL SOIL LOAD ^a (pounds per square foot per foot of depth)	
		Active pressure	At-rest pressure
Well-graded, clean gravels; gravel-sand mixes	GW	30	60
Poorly graded clean gravels; gravel-sand mixes	GP	30	60
Silty gravels, poorly graded gravel-sand mixes	GM	40	60
Clayey gravels, poorly graded gravel-and-clay mixes	GC	45	60
Well-graded, clean sands; gravelly sand mixes	SW	30	60
Poorly graded clean sands; sand-gravel mixes	SP	30	60
Silty sands, poorly graded sand-silt mixes	SM	45	60
Sand-silt clay mix with plastic fines	SM-SC	45	100
Clayey sands, poorly graded sand-clay mixes	SC	60	100
Inorganic silts and clayey silts	ML	45	100
Mixture of inorganic silt and clay	ML-CL	60	100
Inorganic clays of low to medium plasticity	CL	60	100
Organic silts and silt clays, low plasticity	OL	Note b	Note b
Inorganic clayey silts, elastic silts	MH	Note b	Note b
Inorganic clays of high plasticity	CH	Note b	Note b
Organic clays and silty clays	OH	Note b	Note b

For SI: 1 pound per square foot per foot of depth = 0.157 kPa/m, 1 foot = 304.8 mm.

- a. Design lateral soil loads are given for moist conditions for the specified soils at their optimum densities. Actual field conditions shall govern. Submerged or saturated soil pressures shall include the weight of the buoyant soil plus the hydrostatic loads.
- b. Unsuitable as backfill material.
- c. The definition and classification of soil materials shall be in accordance with ASTM D 2487.

SECTION 1807
FOUNDATION WALLS, RETAINING WALLS, AND EMBEDDED POSTS AND POLES

1807.1 Foundation walls. Foundation walls shall be designed and constructed in accordance with Sections 1807.1.1 through 1807.1.6. Foundation walls shall be supported by foundations designed in accordance with Section 1808.

1807.1.1 Design lateral soil loads. Foundation walls shall be designed for the lateral soil loads set forth in Section 1610.

1807.1.2 Unbalanced backfill height. Unbalanced backfill height is the difference in height between the exterior finish ground level and the lower of the top of the concrete footing that supports the foundation wall or the interior finish ground level. Where an interior concrete slab on grade is provided and is in contact with the interior surface of the foundation wall, the unbalanced backfill height shall be permitted to be measured from the exterior finish ground level to the top of the interior concrete slab.

1805.5.1.3 1807.1.3 Rubble stone foundation walls. Foundation walls of rough or random rubble stone shall not be less than 16 inches (406 mm) thick. Rubble stone shall not be used for foundations walls for structures ~~in~~ assigned to Seismic Design Category C, D, E or F.

1805.4.6 1807.1.4 Permanent wood foundations systems. Permanent wood foundation systems shall be designed and installed in accordance with AF&PA Technical Report No. 7. Lumber and plywood shall be treated in accordance with AWPA U1 (Commodity Specification A, Use Category 4B and Section 5.2) and shall be identified in accordance with Section 2303.1.8.1.

1805.5 1807.1.5 Concrete and masonry foundation walls. Concrete and masonry foundation walls shall be designed in accordance with Chapter 19 or 21, respectively as applicable.

Exception: Concrete and masonry foundation walls that are laterally supported at the top and bottom within the parameters of Tables 1805.5(1) through 1805.5(5) ~~are~~ shall be permitted to be designed and constructed in accordance with Sections 1805.5.1 through 1805.5.5 Section 1807.1.6.

1807.1.6 Prescriptive design of concrete and masonry foundation walls. Concrete and masonry foundation walls that are laterally supported at the top and bottom shall be permitted to be designed and constructed in accordance with this section.

1805.5.4 1807.1.6.1 Foundation wall thickness. The minimum thickness of concrete and masonry foundation walls shall comply with Sections 1805.5.1.1 through 1805.5.1.3.

1805.5.1.1 Thickness at top of foundation wall. The thickness of prescriptively designed foundation walls shall not be less than the thickness of the wall supported, except that foundation walls of at least 8 inch (203 mm) nominal width ~~are~~ shall be permitted to support brick-veneered frame walls and 10-inch-wide (254 mm) cavity walls provided the requirements of Section 1805.5.1.2 1807.1.6.2 or 1807.1.6.3 are met. ~~Corbeling of masonry shall be in accordance with Section 2104.2. Where an 8-inch (203 mm) wall is corbelled, the top corbel shall not extend higher than the bottom of the floor framing and shall be a full course of headers at least 6 inches (152 mm) in length or the top course bed joint shall be tied to the vertical wall projection. The tie shall be W2.8 (4.8 mm) and spaced at a maximum horizontal distance of 36 inches (914 mm). The hollow space behind the corbelled masonry shall be filled with mortar or grout.~~

1805.5.1.2 Thickness based on soil loads, unbalanced backfill height and wall height. The thickness of foundation walls shall comply with the requirements of Table 1805.5(5) for concrete walls, Table 1805.5(1) for plain masonry walls or Table 1805.5(2), 1805.5(3) or 1805.5(4) for masonry walls with reinforcement. When using the tables, masonry shall be laid in running bond and the mortar shall be Type M or S.

~~Unbalanced backfill height is the difference in height between the exterior finish ground level and the lower of the top of the concrete footing that supports the foundation wall or the interior finish ground level. Where an interior concrete slab on grade is provided and is in contact with the interior surface of the foundation wall, the unbalanced backfill height is permitted to be measured from the exterior finish ground level to the top of the interior concrete slab.~~

1805.5.2 Foundation wall materials. Concrete foundation walls constructed in accordance with Table 1805.5(5) shall comply with Section 1805.5.2.1. Masonry foundation walls constructed in accordance with Table 1805.5(1), 1805.5(2), 1805.5(3) or 1805.5(4) shall comply with Section 1805.5.2.2.

1805.5.2.4 1807.1.6.2 Concrete foundation walls. Concrete foundation walls shall comply with the following:

1. The thickness shall comply with the requirements of Table 1807.1.6.2.
2. The size and spacing of vertical reinforcement shown in Table ~~1805.5(5)~~ 1807.1.6.2 is based on the use of reinforcement with a minimum yield strength of 60,000 psi (414 Mpa). Vertical reinforcement with a minimum yield strength of 40,000 psi (276 Mpa) or 50,000 psi (345 Mpa) is shall be permitted, provided the same size bar is used and the spacing shown in the table is reduced by multiplying the spacing by 0.67 or 0.83, respectively.
3. Vertical reinforcement, when required, shall be placed nearest the inside face of the wall a distance, d , from the outside face (soil face) of the wall. The distance, d , is equal to the wall thickness, t , minus 1.25 inches (32 mm) plus one-half the bar diameter, d_b , [$d = t - (1.25 + d_b / 2)$]. The reinforcement shall be placed within a tolerance of $\pm 3/8$ inch (9.5 mm) where d is less than or equal to 8 inches (203 mm) or $\pm 1/2$ inch (12.7 mm) where d is greater than 8 inches (203 mm).
4. In lieu of the reinforcement shown in Table ~~1805.5(5)~~ 1807.1.6.2, smaller reinforcing bar sizes with closer spacings that provide an equivalent cross-sectional area of reinforcement per unit length are shall be permitted.
5. Concrete cover for reinforcement measured from the inside face of the wall shall not be less than 3/4 inch (19.1 mm). Concrete cover for reinforcement measured from the outside face of the wall shall not be less than 1.5 inches (38 mm) for No. 5 bars and smaller, and not less than 2 inches (51 mm) for larger bars.
6. Concrete shall have a specified compressive strength, f'_c , of not less than 2,500 psi (17.2 MPa) at 28 days.
7. The unfactored axial load per linear foot of wall shall not exceed $1.2 t f'_c$ where t is the specified wall thickness in inches.

1805.5.5.4 1807.1.6.2.1 Seismic requirements for concrete foundation walls. Based on the seismic design category assigned to the structure in accordance with Section 1613, concrete foundation walls designed using Table ~~1805.5(5)~~ 1807.1.6.2 shall be subject to the following limitations:

1. Seismic Design Categories A and B. No additional seismic requirements, except provide not less than two No. 5 bars around window and door openings. Such bars shall extend at least 24 inches (610 mm) beyond the corners of the openings.
2. Seismic Design Categories C, D, E and F. Tables shall not be used except as allowed for plain concrete members in Section 1908.1.15.

**TABLE 1805.5(5) 1807.1.6.2
CONCRETE FOUNDATION WALLS^{b, c}**

MAXIMUM WALL HEIGHT (feet)	MAXIMUM UNBALANCED BACKFILL HEIGHT ^e (feet)	VERTICAL REINFORCEMENT AND SPACING (inches)								
		Design lateral soil load ^a (psf per foot of depth)								
		30 ^d			45 ^d			60		
		Minimum wall thickness (inches)								
		7.5	9.5	11.5	7.5	9.5	11.5	7.5	9.5	11.5
5	4	PC	PC	PC	PC	PC	PC	PC	PC	PC
	5	PC	PC	PC	PC	PC	PC	PC	PC	PC
6	4	PC	PC	PC	PC	PC	PC	PC	PC	PC
	5	PC	PC	PC	PC	PC	PC	PC	PC	PC
7	6	PC	PC	PC	PC	PC	PC	PC	PC	PC
	7	PC	PC	PC	PC	PC	PC	#5 at 48"	PC	PC
	8	PC	PC	PC	#5 at 46"	PC	PC	#6 at 48"	PC	PC
8	4	PC	PC	PC	PC	PC	PC	PC	PC	PC
	5	PC	PC	PC	PC	PC	PC	PC	PC	PC
	6	PC	PC	PC	PC	PC	PC	#5 at 43"	PC	PC
	7	PC	PC	PC	#5 at 41"	PC	PC	#6 at 43"	PC	PC
9	8	#5 at 47"	PC	PC	#6 at 43"	PC	PC	#6 at 32"	#6 at 44"	PC
	4	PC	PC	PC	PC	PC	PC	PC	PC	PC
	5	PC	PC	PC	PC	PC	PC	PC	PC	PC
	6	PC	PC	PC	PC	PC	PC	#5 at 39"	PC	PC
	7	PC	PC	PC	#5 at 37"	PC	PC	#6 at 38"	#5 at 37"	PC
8	#5 at 41"	PC	PC	#6 at 38"	#5 at 37"	PC	#7 at 39"	#6 at 39"	#4 at 48"	
9 ^d	#6 at 46"	PC	PC	#7 at 41"	#6 at 41"	PC	#7 at 31"	#7 at 41"	#6 at 39"	

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MAXIMUM WALL HEIGHT (feet)	MAXIMUM UNBALANCED BACKFILL HEIGHT ^a (feet)	VERTICAL REINFORCEMENT AND SPACING (inches)								
		Design lateral soil load ^a (psf per foot of depth)								
		30 ^d			45 ^d			60		
		Minimum wall thickness (inches)								
		7.5	9.5	11.5	7.5	9.5	11.5	7.5	9.5	11.5
10	4	PC	PC	PC	PC	PC	PC	PC	PC	PC
	5	PC	PC	PC	PC	PC	PC	PC	PC	PC
	6	PC	PC	PC	PC	PC	PC	PC	PC	PC
	7	PC	PC	PC	PC	PC	PC	PC	#5 at 37"	PC
	8	#5 at 38"	PC	PC	#6 at 48"	PC	PC	#6 at 35"	#6 at 48"	PC
	9 ^d	#6 at 41"	#4 at 48"	PC	#7 at 37"	#7 at 48"	#4 at 48"	#6 at 22"	#7 at 37"	#6 at 45"
	10 ^d	#7 at 45"	#6 at 45"	PC	#7 at 31"	#7 at 40"	#6 at 38"	#6 at 22"	#7 at 30"	#7 at 38"

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound per square foot per foot = 0.157 kPa/m.

- For design lateral soil loads for different classes of soil, see Section 1610.
- Provisions for this table are based on design and construction requirements specified in Section 1805.5.2.1 1807.1.6.2.
- "PC" means plain concrete.
- Where unbalanced backfill height exceeds 8 feet and design lateral soil loads from Table 1610.1 are used, the requirements for 30 and 45 psf per foot of depth are not applicable. See Section 1610.
- For height of unbalanced backfill, see Section 1805.5.1.2 1807.1.2.

1805.5.2.2 1807.1.6.3 Masonry foundation walls. Masonry foundation walls shall comply with the following:

- The thickness shall comply with the requirements of Table 1807.1.6.3(1) for plain masonry walls or Table 1807.1.6.3(2), 1807.1.6.3(3) or 1807.1.6.3(4) for masonry walls with reinforcement.
- Vertical reinforcement shall have a minimum yield strength of 60,000 psi (414 Mpa).
- The specified location of the reinforcement shall equal or exceed the effective depth distance, *d*, noted in Tables 1805.5(2), 1805.5(3) and 1805.5(4) 1807.1.6.3(2), 1807.1.6.3(3) and 1807.1.6.3(4) and shall be measured from the face of the exterior (soil) side of the wall to the center of the vertical reinforcement. The reinforcement shall be placed within the tolerances specified in ACI 530.1/ASCE 6/TMS 402, Article 3.4 B7 of the specified location.
- Grout shall comply with Section 2103.12.
- Concrete masonry units shall comply with ASTM C 90.
- Clay masonry units shall comply with ASTM C 652 for hollow brick, except compliance with ASTM C 62 or C 216 is shall be permitted when where solid masonry units are installed in accordance with Table 1805.5(1) 1807.1.6.3(1) for plain masonry.
- Masonry units shall be laid in running bond and installed with Type M or S mortar in accordance with Section 2103.8.
- The unfactored axial load per linear foot of wall shall not exceed $1.2 t f'_m$ where *t* is the specified wall thickness in inches and *f'_m* is the specified compressive strength of masonry in pounds per square inch.
- At least 4 inches (102 mm) of solid masonry shall be provided at girder supports at the top of hollow masonry unit foundation walls.
- Corbeling of masonry shall be in accordance with Section 2104.2. Where an 8-inch (203 mm) wall is corbelled, the top corbel shall not extend higher than the bottom of the floor framing and shall be a full course of headers at least 6 inches (152 mm) in length or the top course bed joint shall be tied to the vertical wall projection. The tie shall be W2.8 (4.8 mm) and spaced at a maximum horizontal distance of 36 inches (914 mm). The hollow space behind the corbelled masonry shall be filled with mortar or grout.

1805.5.3 1807.1.6.3.1 Alternative foundation wall reinforcement. In lieu of the reinforcement provisions for masonry foundation walls in Table 1805.5(2), 1805.5(3) or 1805.5(4) 1807.1.6.3(2), 1807.1.6.3(3) or 1807.1.6.3(4), alternative reinforcing bar sizes and spacings having an equivalent cross-sectional area of reinforcement per linear foot (mm) of wall are shall be permitted to be used, provided the spacing of reinforcement does not exceed 72 inches (1829 mm) and reinforcing bar sizes do not exceed No. 11.

1805.5.4 Hollow masonry walls. At least 4 inches (102 mm) of solid masonry shall be provided at girder supports at the top of hollow masonry unit foundation walls.

1805.5.5 Seismic requirements. Tables 1805.5(1) through 1805.5(5) shall be subject to the following limitations in Sections 1805.5.5.1 and 1805.5.5.2 based on the seismic design category assigned to the structure as defined in Section 1613.

~~1805.5.5.2 1807.1.6.3.2~~ **Seismic requirements for masonry foundation walls.** Based on the seismic design category assigned to the structure in accordance with Section 1613, masonry foundation walls designed using Tables ~~1805.5(1) through 1805.5(4)~~ 1807.1.6.3(1) through 1807.1.6.3(4) shall be subject to the following limitations:

1. Seismic Design Categories A and B. No additional seismic requirements.
2. Seismic Design Category C. A design using Tables ~~1805.5(1) through 1805.5(4)~~ 1807.1.6.3(1) through 1807.1.6.3(4) is subject to the seismic requirements of Section 2106.4.
3. Seismic Design Category D. A design using Tables ~~1805.2(2) through 1805.5(4)~~ 1807.1.6.3(2) through 1807.1.6.3(4) is subject to the seismic requirements of Section 2106.5.
4. Seismic Design Categories E and F. A design using Tables ~~1805.2(2) through 1805.5(4)~~ 1807.1.6.3(2) through 1807.1.6.3(4) is subject to the seismic requirements of Section 2106.6.

(Renumber subsequent sections)

TABLE 1805.5(1) 1807.1.6.3(1)
PLAIN MASONRY FOUNDATION WALLS ^{a, b, c}

MAXIMUM WALL HEIGHT (feet)	MAXIMUM UNBALANCED BACKFILL HEIGHT ^e (feet)	MINIMUM NOMINAL WALL THICKNESS (inches)		
		Soil classes and Design lateral soil load ^a (psf per foot below natural grade of depth)		
		GW, GP, SW and SP soils 30 ^f	GM, GC, SM, SM-SC and ML soils 45 ^f	SC, ML-CL and Inorganic-CL soils 60
7	4 (or less)	8	8	8
	5	8	10	10
	6	10	12	10 (solid ^c)
	7	12	10 (solid ^c)	10 (solid ^c)
8	4 (or less)	8	8	8
	5	8	10	12
	6	10	12	12 (solid ^c)
	7	12	12 (solid ^c)	Note d
9	8	10 (solid ^c)	12 (solid ^c)	Note d
	4 (or less)	8	8	8
	5	8	10	12
	6	12	12	12 (solid ^c)
	7	12 (solid ^c)	12 (solid ^c)	Note d
	8	12 (solid ^c)	Note d	Note d
	9 ^f	Note d	Note d	Note d

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound per square foot per foot = 0.157 kPa/m.

- a. For design lateral soil loads, see Section 1610. ~~Soil classes are in accordance with the Unified Soil Classification System and design lateral soil loads are for moist soil conditions without hydrostatic pressure.~~
- b. Provisions for this table are based on design and construction requirements specified in Section ~~1805.5.2.2~~ 1807.1.6.3.
- c. Solid grouted hollow units or solid masonry units.
- d. A design in compliance with Chapter 21 or reinforcement in accordance with Table ~~1805.5(2)~~ 1807.1.6.3(2) is required.
- e. For height of unbalanced backfill, see Section ~~1805.5.1.2~~ 1807.1.2.
- f. Where unbalanced backfill height exceeds 8 feet and design lateral soil loads from Table 1610.1 are used, the requirements for 30 and 45 psf per foot of depth are not applicable. See Section 1610.

TABLE 1805.5(2) 1807.1.6.3(2)
8-INCH MASONRY FOUNDATION WALLS WITH REINFORCEMENT WHERE $d \geq 5$ INCHES ^{a, b, c}

MAXIMUM WALL HEIGHT (feet-inches)	MAXIMUM UNBALANCED BACKFILL HEIGHT ^d (feet-inches)	VERTICAL REINFORCEMENT		
		Soil classes and <u>Design</u> lateral soil load ^a (psf per foot below natural grade of depth)		
		GW, GP, SW and SP soils 30 ^e	GM, GC, SM, SM-SC and ML soils 45 ^e	SC, ML-CL and Inorganic-CL soils 60
7-4	4-0 (or less)	#4 at 48" o.c.	#4 at 48" o.c.	#4 at 48" o.c.
	5-0	#4 at 48" o.c.	#4 at 48" o.c.	#4 at 48" o.c.
	6-0	#4 at 48" o.c.	#5 at 48" o.c.	#5 at 48" o.c.
	7-4	#5 at 48" o.c.	#6 at 48" o.c.	#7 at 48" o.c.
8-0	4-0 (or less)	#4 at 48" o.c.	#4 at 48" o.c.	#4 at 48" o.c.
	5-0	#4 at 48" o.c.	#4 at 48" o.c.	#4 at 48" o.c.
	6-0	#4 at 48" o.c.	#5 at 48" o.c.	#5 at 48" o.c.
	7-0	#5 at 48" o.c.	#6 at 48" o.c.	#7 at 48" o.c.
8-8	4-0 (or less)	#4 at 48" o.c.	#4 at 48" o.c.	#4 at 48" o.c.
	5-0	#4 at 48" o.c.	#4 at 48" o.c.	#5 at 48" o.c.
	6-0	#4 at 48" o.c.	#5 at 48" o.c.	#6 at 48" o.c.
	7-0	#5 at 48" o.c.	#6 at 48" o.c.	#7 at 48" o.c.
9-4	4-0 (or less)	#4 at 48" o.c.	#4 at 48" o.c.	#4 at 48" o.c.
	5-0	#4 at 48" o.c.	#4 at 48" o.c.	#5 at 48" o.c.
	6-0	#4 at 48" o.c.	#5 at 48" o.c.	#6 at 48" o.c.
	7-0	#5 at 48" o.c.	#6 at 48" o.c.	#7 at 48" o.c.
10-0	4-0 (or less)	#4 at 48" o.c.	#4 at 48" o.c.	#4 at 48" o.c.
	5-0	#4 at 48" o.c.	#4 at 48" o.c.	#5 at 48" o.c.
	6-0	#4 at 48" o.c.	#5 at 48" o.c.	#6 at 48" o.c.
	7-0	#5 at 48" o.c.	#6 at 48" o.c.	#7 at 48" o.c.
	8-0	#6 at 48" o.c.	#7 at 48" o.c.	#8 at 48" o.c.
	9-0 ^e	#7 at 48" o.c.	#8 at 48" o.c.	#9 at 48" o.c.
	10-0 ^e	#7 at 48" o.c.	#9 at 48" o.c.	#9 at 48" o.c.

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound per square foot per foot = 0.157 kPa/m.

- a. For design lateral soil loads, see Section 1610. ~~Soil classes are in accordance with the Unified Soil Classification System and design lateral soil loads are for moist soil conditions without hydrostatic pressure.~~
- b. Provisions for this table are based on design and construction requirements specified in Section 1805.5.2.2 1807.1.6.3.
- c. For alternative reinforcement, see Section 1805.5.3 1807.1.6.3.1.
- d. For height of unbalanced backfill, see Section 1805.5.1.2 1807.1.2.
- e. Where unbalanced backfill height exceeds 8 feet and design lateral soil loads from Table 1610.1 are used, the requirements for 30 and 45 psf per foot of depth are not applicable. See Section 1610.

TABLE 1805.5(3) 1807.1.6.3(3)
10-INCH MASONRY FOUNDATION WALLS WITH REINFORCEMENT WHERE $d \geq 6.75$ INCHES ^{a, b, c}

MAXIMUM WALL HEIGHT (feet-inches)	MAXIMUM UNBALANCED BACKFILL HEIGHT ^d (feet-inches)	VERTICAL REINFORCEMENT		
		Soil classes and Design lateral soil load ^a (psf per foot below natural grade of depth)		
		GW, GP, SW and SP soils 30 ^e	GM, GC, SM, SM-SC and ML soils 45 ^e	SC, ML-CL and Inorganic CL soils 60
7-4	4-0 (or less)	#4 at 56" o.c.	#4 at 56" o.c.	#4 at 56" o.c.
	5-0	#4 at 56" o.c.	#4 at 56" o.c.	#4 at 56" o.c.
	6-0	#4 at 56" o.c.	#4 at 56" o.c.	#5 at 56" o.c.
	7-4	#4 at 56" o.c.	#5 at 56" o.c.	#6 at 56" o.c.
8-0	4-0 (or less)	#4 at 56" o.c.	#4 at 56" o.c.	#4 at 56" o.c.
	5-0	#4 at 56" o.c.	#4 at 56" o.c.	#4 at 56" o.c.
	6-0	#4 at 56" o.c.	#4 at 56" o.c.	#5 at 56" o.c.
	7-0	#4 at 56" o.c.	#5 at 56" o.c.	#6 at 56" o.c.
8-8	8-0	#5 at 56" o.c.	#6 at 56" o.c.	#7 at 56" o.c.
	4-0 (or less)	#4 at 56" o.c.	#4 at 56" o.c.	#4 at 56" o.c.
	5-0	#4 at 56" o.c.	#4 at 56" o.c.	#4 at 56" o.c.
	6-0	#4 at 56" o.c.	#4 at 56" o.c.	#5 at 56" o.c.
9-4	7-0	#4 at 56" o.c.	#5 at 56" o.c.	#6 at 56" o.c.
	8-0	#5 at 56" o.c.	#6 at 56" o.c.	#7 at 56" o.c.
	9-4 ^e	#6 at 56" o.c.	#7 at 56" o.c.	#8 at 56" o.c.
	4-0 (or less)	#4 at 56" o.c.	#4 at 56" o.c.	#4 at 56" o.c.
10-0	5-0	#4 at 56" o.c.	#4 at 56" o.c.	#4 at 56" o.c.
	6-0	#4 at 56" o.c.	#5 at 56" o.c.	#5 at 56" o.c.
	7-0	#5 at 56" o.c.	#6 at 56" o.c.	#7 at 56" o.c.
	8-0	#5 at 56" o.c.	#7 at 56" o.c.	#8 at 56" o.c.
	9-0 ^e	#6 at 56" o.c.	#7 at 56" o.c.	#9 at 56" o.c.
	10-0 ^e	#7 at 56" o.c.	#8 at 56" o.c.	#9 at 56" o.c.

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound per square foot per foot = 0.157 kPa/m.

- For design lateral soil loads, see Section 1610. ~~Soil classes are in accordance with the Unified Soil Classification System and design lateral soil loads are for moist soil conditions without hydrostatic pressure.~~
- Provisions for this table are based on design and construction requirements specified in Section 1805.5.2.2 1807.1.6.3.
- For alternative reinforcement, see Section ~~1805.5.3~~ 1807.1.6.3.1.
- For height of unbalanced backfill, see Section ~~1805.5.1.2~~ 1807.1.2.
- Where unbalanced backfill height exceeds 8 feet and design lateral soil loads from Table 1610.1 are used, the requirements for 30 and 45 psf per foot of depth are not applicable. See Section 1610.

TABLE 1805.5(4) 1807.1.6.3(4)
12-INCH MASONRY FOUNDATION WALLS WITH REINFORCEMENT WHERE $d \geq 8.75$ INCHES ^{a, b, c}

MAXIMUM WALL HEIGHT (feet-inches)	MAXIMUM UNBALANCED BACKFILL HEIGHT ^d (feet-inches)	VERTICAL REINFORCEMENT		
		Soil classes and Design lateral soil load ^a (psf per foot below natural grade of depth)		
		GW, GP, SW and SP soils 30 ^e	GM, GC, SM, SM-SC and ML soils 45 ^e	SC, ML-CL and Inorganic-CL soils 60
7-4	4-0 (or less)	#4 at 72" o.c.	#4 at 72" o.c.	#4 at 72" o.c.
	5-0	#4 at 72" o.c.	#4 at 72" o.c.	#4 at 72" o.c.
	6-0	#4 at 72" o.c.	#4 at 72" o.c.	#5 at 72" o.c.
	7-4	#4 at 72" o.c.	#5 at 72" o.c.	#6 at 72" o.c.
8-0	4-0 (or less)	#4 at 72" o.c.	#4 at 72" o.c.	#4 at 72" o.c.
	5-0	#4 at 72" o.c.	#4 at 72" o.c.	#4 at 72" o.c.
	6-0	#4 at 72" o.c.	#4 at 72" o.c.	#5 at 72" o.c.
	8-0	#5 at 72" o.c.	#6 at 72" o.c.	#7 at 72" o.c.
8-8	4-0 (or less)	#4 at 72" o.c.	#4 at 72" o.c.	#4 at 72" o.c.
	5-0	#4 at 72" o.c.	#4 at 72" o.c.	#4 at 72" o.c.
	6-0	#4 at 72" o.c.	#4 at 72" o.c.	#5 at 72" o.c.
	8-8 ^e	#5 at 72" o.c.	#7 at 72" o.c.	#8 at 72" o.c.
9-4	4-0 (or less)	#4 at 72" o.c.	#4 at 72" o.c.	#4 at 72" o.c.
	5-0	#4 at 72" o.c.	#4 at 72" o.c.	#4 at 72" o.c.
	6-0	#4 at 72" o.c.	#5 at 72" o.c.	#5 at 72" o.c.
	9-4 ^e	#6 at 72" o.c.	#7 at 72" o.c.	#8 at 72" o.c.
10-0	4-0 (or less)	#4 at 72" o.c.	#4 at 72" o.c.	#4 at 72" o.c.
	5-0	#4 at 72" o.c.	#4 at 72" o.c.	#4 at 72" o.c.
	6-0	#4 at 72" o.c.	#5 at 72" o.c.	#5 at 72" o.c.
	7-0	#4 at 72" o.c.	#6 at 72" o.c.	#6 at 72" o.c.
	8-0	#5 at 72" o.c.	#6 at 72" o.c.	#7 at 72" o.c.
	10-0 ^e	#7 at 72" o.c.	#8 at 72" o.c.	#9 at 72" o.c.

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound per square foot per foot = 0.157 kPa/m.

- a. For design lateral soil loads, see Section 1610. ~~Soil classes are in accordance with the Unified Soil Classification System and design lateral soil loads are for moist soil conditions without hydrostatic pressure.~~
- b. Provisions for this table are based on design and construction requirements specified in Section 1805.5.2.2 1807.1.6.3.
- c. For alternative reinforcement, see Section ~~1805.5.3~~ 1807.1.6.3.1.
- d. For height of unbalanced backfill, see Section ~~1805.5.1.2~~ 1807.1.2.
- e. Where unbalanced backfill height exceeds 8 feet and design lateral soil loads from Table 1610.1 are used, the requirements for 30 and 45 psf per foot of depth are not applicable. See Section 1610.

SECTION 1806
RETAINING WALLS

1807.2 Retaining walls. Retaining walls shall be designed in accordance with Sections 1807.2.1 through 1807.2.3.

1806.4 1807.2.1 General. Retaining walls shall be designed to ensure stability against overturning, sliding, excessive foundation pressure and water uplift.

1807.2.2 Design lateral soil loads. Retaining walls shall be designed for the lateral soil loads set forth in Section 1610.

1807.2.3 Safety factor. Retaining walls shall be designed ~~for~~ to resist the lateral action of soil to produce sliding and overturning with a safety factor of 1.5 against lateral sliding and overturning. The load combinations of Section 1605.3 shall not apply to these requirements.

1805.7 1807.3 Designs employing lateral bearing Embedded posts and poles. Designs to resist both axial and lateral loads employing posts or poles as columns embedded in earth or embedded in concrete footings in the earth shall ~~conform to the requirements of~~ be in accordance with Sections 1805.7.1 through 1805.7.3 1807.3.1 through 1807.3.3.

1805.7.1 1807.3.1 Limitations. The design procedures outlined in this section are subject to the following limitations:

1. The frictional resistance for structural walls and slabs on silts and clays shall be limited to one-half of the normal force imposed on the soil by the weight of the footing or slab.
2. Posts embedded in earth shall not be used to provide lateral support for structural or nonstructural materials such as plaster, masonry or concrete unless bracing is provided that develops the limited deflection required.

Wood poles shall be treated in accordance with AWPA U1 for sawn timber posts (Commodity Specification A, Use Category 4B), and for round timber posts (Commodity Specification B, Use Category 4B).

1805.7.2 1807.3.2 Design criteria. The depth to resist lateral loads shall be determined by using the design criteria established in Sections 1805.7.2.1 through 1805.7.2.3 1807.3.2.1 through 1807.3.2.3, or by other methods approved by the building official.

1805.7.2.4 1807.3.2.1 Nonconstrained. The following formula shall be used in determining the depth of embedment required to resist lateral loads where no lateral constraint is provided at the ground surface, such as by a rigid floor or rigid ground surface pavement, and where no lateral constraint is provided above the ground surface, such as by a structural diaphragm.

$$d = 0.5 A \{1 + [1 + (4.36 h / A)]^{1/2}\} \quad \text{(Equation 18-1)}$$

where:

- A = 2.34 $P / S_1 b$.
- b = Diameter of round post or footing or diagonal dimension of square post or footing, feet (m).
- d = Depth of embedment in earth in feet (m) but not over 12 feet (3658 mm) for purpose of computing lateral pressure.
- h = Distance in feet (m) from ground surface to point of application of "P."
- P = Applied lateral force in pounds (kN).
- S_1 = Allowable lateral soil-bearing pressure as set forth in Section 1804.3 based on a depth of one-third the depth of embedment in pounds per square foot (psf) (kPa).

1805.7.2.2 1807.3.2.2 Constrained. The following formula shall be used to determine the depth of embedment required to resist lateral loads where lateral constraint is provided at the ground surface, such as by a rigid floor or pavement.

$$d^2 = 4.25 (P h / S_3 b) \quad \text{(Equation 18-2)}$$

or alternatively

$$d^2 = 4.25 (M_g / S_3 b) \quad \text{(Equation 18-3)}$$

where:

- M_g = Moment in the post at grade, in foot-pounds (kN-m).
- S_3 = Allowable lateral soil-bearing pressure as set forth in Section 1804.3 based on a depth equal to the depth of embedment in pounds per square foot (kPa).

1805.7.2.3 1807.3.2.3 Vertical load. The resistance to vertical loads shall be determined by using the allowable soil-bearing vertical foundation pressure set forth in Table 1804.2.

1805.7.3 1807.3.3 Backfill. The backfill in the annular space around columns not embedded in poured footings shall be by one of the following methods:

1. Backfill shall be of concrete with an ultimate strength of 2,000 psi (13.8 MPa) at 28 days. The hole shall not be less than 4 inches (102 mm) larger than the diameter of the column at its bottom or 4 inches (102 mm) larger than the diagonal dimension of a square or rectangular column.
2. Backfill shall be of clean sand. The sand shall be thoroughly compacted by tamping in layers not more than 8 inches (203 mm) in depth.
3. Backfill shall be of controlled low-strength material (CLSM).

2. Delete without substitution:

~~**1805.5.6 Foundation wall drainage.** Foundation walls shall be designed to support the weight of the full hydrostatic pressure of undrained backfill unless a drainage system is installed in accordance with Sections 1807.4.2 and 1807.4.3.~~

~~**1805.6 Foundation plate or sill bolting.** Wood foundation plates or sills shall be bolted or strapped to the foundation or foundation wall as provided in Chapter 23.~~

Reason: Code clarification.

Makes terminology in 1610.1 consistent with Chapter 18; the IBC does not recognize “basement walls,” instead calling them “foundation walls.” Moves the loading requirement of Section 1805.5.6 to 1610.1, where the related loading requirements occur. Makes the scoping language of the Section 1610.1 exception consistent with the sections concerning foundation walls (current Section 1805.5); the key condition is that walls are “laterally supported at the top”, not that the walls are “supporting” a floor. Also, “flexible floor systems” are undefined, but “flexible diaphragms” are defined.

Editorial reorganization to group requirements related to laterally loaded elements (foundation walls, retaining walls, and embedded posts and poles). Recognizes the distinction between foundation walls and foundations. Moves reference to design lateral soil loads from footnotes to text. Moves the definition of unbalanced backfill height from the prescriptive design requirements to a general section. Moves the general requirements related to rubble stone out of the prescriptive design requirements where it does not apply (as rubble stone is not laid in running bond).

Moves requirements related to permanent wood foundation systems to this section on foundation walls. According to AF&PA PWF-06, such systems are “engineered to support lateral soil pressures as well as dead, live, snow, wind, and seismic loads,” where the foundation wall behavior is primary and vertical load behavior is secondary. That document also repeated refers to “foundation walls” (for instance, see Figures 3 and 4).

Makes footnotes for prescriptively designed concrete and masonry foundation walls more consistent. Separates prescriptive design requirements for concrete and masonry foundation walls.

In each of the tables, clarifies the important footnote related to applicability of 30 and 45 psf design loads. Where the unbalanced backfill height exceeds 8 feet, Section 1610.1 requires that foundation walls be designed for at-rest pressures. Where lateral soil loads from Table 1610.1 are used, values of 30 and 45 psf occur only for active pressure. Therefore, where both of these conditions are satisfied, the prescriptive design table entries for 30 and 45 psf cannot be used.

For prescriptively designed masonry foundation walls, the revision to item 7 (running bond) was in 1805.5.1.2, item 9 was in Section 1805.5.4, and item 10 was in Section 1805.5.1.1.

Section 1805.6 is not needed. As that section indicates, the requirements for sill plate anchorage appear in Chapter 23 (Sections 2305.3.11 and 2308.6).

The safety factor for stability of retaining walls predates modern load combinations. The revised text makes clear that load combinations do not apply to consideration of retaining wall sliding and overturning.

Correlation note: In Section 1704.5 exception 2 change “Table 1805.5(1), 1805.5(2), 1805.5(3) or 1805.5(4)” to “Table 1807.1.6.3(1), 1807.1.6.3(2), 1807.1.6.3(3) or 1807.1.6.3(4)”.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Errata: Replace the entire proposal with the following:

Revise as follows:

1610.1 General. ~~Basement~~ Foundation walls and retaining walls shall be designed to resist lateral soil loads. Soil loads specified in Table 1610.1 shall be used as the minimum design lateral soil loads unless specified otherwise in a soil investigation report approved by the building official. ~~Basement Foundation~~ walls and other walls in which horizontal movement is restricted at the top shall be designed for at-rest pressure. Retaining walls free to move and rotate at the top ~~are~~ shall be permitted to be designed for active pressure. Design lateral pressure from surcharge loads shall be added to the lateral earth pressure load. Design lateral pressure shall be increased if soils ~~with expansion potential are present at the site~~ at the site are expansive. Foundation walls shall be designed to support the weight of the full hydrostatic pressure of undrained backfill unless a drainage system is installed in accordance with Sections 1807.4.2 and 1807.4.3.

Exception: ~~Basement Foundation~~ walls extending not more than 8 feet (2438 mm) below grade and ~~supporting~~ laterally supported at the top by flexible floor systems diaphragms shall be permitted to be designed for active pressure.

**TABLE 1610.1
SOIL LATERAL SOIL LOAD**

DESCRIPTION OF BACKFILL MATERIAL ^c	UNIFIED SOIL CLASSIFICATION	DESIGN LATERAL SOIL LOAD ^a (pounds per square foot per foot of depth)	
		Active pressure	At-rest pressure
Well-graded, clean gravels; gravel-sand mixes	GW	30	60
Poorly graded clean gravels; gravel-sand mixes	GP	30	60
Silty gravels, poorly graded gravel-sand mixes	GM	40	60
Clayey gravels, poorly graded gravel-and-clay mixes	GC	45	60
Well-graded, clean sands; gravelly sand mixes	SW	30	60
Poorly graded clean sands; sand-gravel mixes	SP	30	60
Silty sands, poorly graded sand-silt mixes	SM	45	60
Sand-silt clay mix with plastic fines	SM-SC	45	100
Clayey sands, poorly graded sand-clay mixes	SC	60	100
Inorganic silts and clayey silts	ML	45	100
Mixture of inorganic silt and clay	ML-CL	60	100
Inorganic clays of low to medium plasticity	CL	60	100
Organic silts and silt clays, low plasticity	OL	Note b	Note b
Inorganic clayey silts, elastic silts	MH	Note b	Note b
Inorganic clays of high plasticity	CH	Note b	Note b
Organic clays and silty clays	OH	Note b	Note b

For SI: 1 pound per square foot per foot of depth = 0.157 kPa/m, 1 foot = 304.8 mm.

- Design lateral soil loads are given for moist conditions for the specified soils at their optimum densities. Actual field conditions shall govern. Submerged or saturated soil pressures shall include the weight of the buoyant soil plus the hydrostatic loads.
- Unsuitable as backfill material.
- The definition and classification of soil materials shall be in accordance with ASTM D 2487.

SECTION 1807 FOUNDATION WALLS, RETAINING WALLS, AND EMBEDDED POSTS AND POLES

1807.1 Foundation walls. Foundation walls shall be designed and constructed in accordance with Sections 1807.1.1 through 1807.1.6. Foundation walls shall be supported by foundations designed in accordance with Section 1808.

1807.1.1 Design lateral soil loads. Foundation walls shall be designed for the lateral soil loads set forth in Section 1610.

1807.1.2 Unbalanced backfill height. Unbalanced backfill height is the difference in height between the exterior finish ground level and the lower of the top of the concrete footing that supports the foundation wall or the interior finish ground level. Where an interior concrete slab on grade is provided and is in contact with the interior surface of the foundation wall, the unbalanced backfill height shall be permitted to be measured from the exterior finish ground level to the top of the interior concrete slab.

1805.5.1.3 1807.1.3 Rubble stone foundation walls. Foundation walls of rough or random rubble stone shall not be less than 16 inches (406 mm) thick. Rubble stone shall not be used for foundation walls for structures assigned to Seismic Design Category C, D, E or F.

1805.4.6 1807.1.4 Permanent wood foundation systems. Permanent wood foundation systems shall be designed and installed in accordance with AF&PA Technical Report No. 7. Lumber and plywood shall be treated in accordance with AWPA U1 (Commodity Specification A, Use Category 4B and Section 5.2) and shall be identified in accordance with Section 2303.1.8.1.

1805.5 1807.1.5 Concrete and masonry foundation walls. Concrete and masonry foundation walls shall be designed in accordance with Chapter 19 or 21, respectively as applicable.

Exception: Concrete and masonry foundation walls that are laterally supported at the top and bottom within the parameters of Tables 1805.5(4) through 1805.5(5) are shall be permitted to be designed and constructed in accordance with Sections 1805.5.1 through 1805.5.5 Section 1807.1.6.

1807.1.6 Prescriptive design of concrete and masonry foundation walls. Concrete and masonry foundation walls that are laterally supported at the top and bottom shall be permitted to be designed and constructed in accordance with this section.

1805.5.1 1807.1.6.1 Foundation wall thickness. The minimum thickness of concrete and masonry foundation walls shall comply with Sections 1805.5.1.1 through 1805.5.1.3.

1805.5.1.1 Thickness at top of foundation wall. The thickness of prescriptively designed foundation walls shall not be less than the thickness of the wall supported, except that foundation walls of at least 8 inch (203 mm) nominal width are shall be permitted to support brick-veneered frame walls and 10-inch-wide (254 mm) cavity walls provided the requirements of Section 1805.5.1.2 1807.1.6.2 or 1807.1.6.3 are met. Corbeling of masonry shall be in accordance with Section 2104.2. Where an 8-inch (203 mm) wall is corbelled, the top corbel shall not extend higher than the bottom of the floor framing and shall be a full course of headers at least 6 inches (152 mm) in length or the top course bed joint shall be tied to the vertical wall projection. The tie shall be W2.8 (4.8 mm) and spaced at a maximum horizontal distance of 36 inches (914 mm). The hollow space behind the corbelled masonry shall be filled with mortar or grout.

1805.5.1.2 Thickness based on soil loads, unbalanced backfill height and wall height. The thickness of foundation walls shall comply with the requirements of Table 1805.5(5) for concrete walls, Table 1805.5(4) for plain masonry walls or Table 1805.5(2), 1805.5(3) or 1805.5(4) for masonry walls with reinforcement. When using the tables, masonry shall be laid in running bond and the mortar shall be Type M or S.

Unbalanced backfill height is the difference in height between the exterior finish ground level and the lower of the top of the concrete footing that supports the foundation wall or the interior finish ground level. Where an interior concrete slab on grade is provided and is in contact with the interior surface of the foundation wall, the unbalanced backfill height is permitted to be measured from the exterior finish ground level to the top of the interior concrete slab.

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1805.5.2 Foundation wall materials. Concrete foundation walls constructed in accordance with Table 1805.5(5) shall comply with Section 1805.5.2.1. Masonry foundation walls constructed in accordance with Table 1805.5(1), 1805.5(2), 1805.5(3) or 1805.5(4) shall comply with Section 1805.5.2.2.

1805.5.2.4 1807.1.6.2 Concrete foundation walls. Concrete foundation walls shall comply with the following:

1. The thickness shall comply with the requirements of Table 1807.1.6.2.
2. The size and spacing of vertical reinforcement shown in Table ~~1805.5(5)~~ 1807.1.6.2 is based on the use of reinforcement with a minimum yield strength of 60,000 psi (414 Mpa). Vertical reinforcement with a minimum yield strength of 40,000 psi (276 Mpa) or 50,000 psi (345 Mpa) is shall be permitted, provided the same size bar is used and the spacing shown in the table is reduced by multiplying the spacing by 0.67 or 0.83, respectively.
3. Vertical reinforcement, when required, shall be placed nearest the inside face of the wall a distance, d , from the outside face (soil face) of the wall. The distance, d , is equal to the wall thickness, t , minus 1.25 inches (32 mm) plus one-half the bar diameter, d_b , [$d = t - (1.25 + d_b / 2)$]. The reinforcement shall be placed within a tolerance of $\pm 3/8$ inch (9.5 mm) where d is less than or equal to 8 inches (203 mm) or $\pm 1/2$ inch (12.7 mm) where d is greater than 8 inches (203 mm).
4. In lieu of the reinforcement shown in Table ~~1805.5(5)~~ 1807.1.6.2, smaller reinforcing bar sizes with closer spacings that provide an equivalent cross-sectional area of reinforcement per unit length are shall be permitted.
5. Concrete cover for reinforcement measured from the inside face of the wall shall not be less than 3/4 inch (19.1 mm). Concrete cover for reinforcement measured from the outside face of the wall shall not be less than 1.5 inches (38 mm) for No. 5 bars and smaller, and not less than 2 inches (51 mm) for larger bars.
6. Concrete shall have a specified compressive strength, f'_c , of not less than 2,500 psi (17.2 MPa) at 28 days.
7. The unfactored axial load per linear foot of wall shall not exceed $1.2 t f'_c$ where t is the specified wall thickness in inches.

1805.5.4 1807.1.6.2.1 Seismic requirements for concrete foundation walls. Based on the seismic design category assigned to the structure in accordance with Section 1613, concrete foundation walls designed using Table ~~1805.5(5)~~ 1807.1.6.2 shall be subject to the following limitations:

1. Seismic Design Categories A and B. No additional seismic requirements, except provide not less than two No. 5 bars around window and door openings. Such bars shall extend at least 24 inches (610 mm) beyond the corners of the openings.
2. Seismic Design Categories C, D, E and F. Tables shall not be used except as allowed for plain concrete members in Section 1908.1.15.

**TABLE ~~1805.5(5)~~ 1807.1.6.2
CONCRETE FOUNDATION WALLS^{b, c}**

MAXIMUM WALL HEIGHT (feet)	MAXIMUM UNBALANCED BACKFILL HEIGHT ^a (feet)	VERTICAL REINFORCEMENT AND SPACING (inches)								
		Design lateral soil load ^a (psf per foot of depth)								
		30 ^d			45 ^d			60		
		Minimum wall thickness (inches)								
		7.5	9.5	11.5	7.5	9.5	11.5	7.5	9.5	11.5
5	4	PC	PC	PC	PC	PC	PC	PC	PC	PC
	5	PC	PC	PC	PC	PC	PC	PC	PC	PC
6	4	PC	PC	PC	PC	PC	PC	PC	PC	PC
	5	PC	PC	PC	PC	PC	PC	PC	PC	PC
	6	PC	PC	PC	PC	PC	PC	PC	PC	PC
7	4	PC	PC	PC	PC	PC	PC	PC	PC	PC
	5	PC	PC	PC	PC	PC	PC	PC	PC	PC
	6	PC	PC	PC	PC	PC	PC	#5 at 48"	PC	PC
	7	PC	PC	PC	#5 at 46"	PC	PC	#6 at 48"	PC	PC
8	4	PC	PC	PC	PC	PC	PC	PC	PC	PC
	5	PC	PC	PC	PC	PC	PC	PC	PC	PC
	6	PC	PC	PC	PC	PC	PC	#5 at 43"	PC	PC
	7	PC	PC	PC	#5 at 41"	PC	PC	#6 at 43"	PC	PC
9	8	#5 at 47"	PC	PC	#6 at 43"	PC	PC	#6 at 32"	#6 at 44"	PC
	4	PC	PC	PC	PC	PC	PC	PC	PC	PC
	5	PC	PC	PC	PC	PC	PC	PC	PC	PC
	6	PC	PC	PC	PC	PC	PC	#5 at 39"	PC	PC
	7	PC	PC	PC	#5 at 37"	PC	PC	#6 at 38"	#5 at 37"	PC
10	8	#5 at 41"	PC	PC	#6 at 38"	#5 at 37"	PC	#7 at 39"	#6 at 39"	#4 at 48"
	9 ^d	#6 at 46"	PC	PC	#7 at 41"	#6 at 41"	PC	#7 at 31"	#7 at 41"	#6 at 39"
	4	PC	PC	PC	PC	PC	PC	PC	PC	PC
10	5	PC	PC	PC	PC	PC	PC	PC	PC	PC
	6	PC	PC	PC	PC	PC	PC	#5 at 37"	PC	PC
	7	PC	PC	PC	#6 at 48"	PC	PC	#6 at 35"	#6 at 48"	PC
	8	#5 at 38"	PC	PC	#7 at 47"	#6 at 47"	PC	#7 at 35"	#7 at 47"	#6 at 45"
	9 ^d	#6 at 41"	#4 at 48"	PC	#7 at 37"	#7 at 48"	#4 at 48"	#6 at 22"	#7 at 37"	#7 at 47"
	10 ^d	#7 at 45"	#6 at 45"	PC	#7 at 31"	#7 at 40"	#6 at 38"	#6 at 22"	#7 at 30"	#7 at 38"

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound per square foot per foot = 0.157 kPa/m.

- a. For design lateral soil loads for different classes of soil, see Section 1610.
- b. Provisions for this table are based on design and construction requirements specified in Section ~~1805.5.2.4~~ 1807.1.6.2.
- c. "PC" means plain concrete.
- d. Where unbalanced backfill height exceeds 8 feet and design lateral soil loads from Table 1610.1 are used, the requirements for 30 and 45 psf per foot of depth are not applicable. See Section 1610.
- e. For height of unbalanced backfill, see Section ~~1805.5.4.2~~ 1807.1.2.

1805.5.2.2 1807.1.6.3 Masonry foundation walls. Masonry foundation walls shall comply with the following:

1. The thickness shall comply with the requirements of Table 1807.1.6.3(1) for plain masonry walls or Table 1807.1.6.3(2), 1807.1.6.3(3) or 1807.1.6.3(4) for masonry walls with reinforcement.
2. Vertical reinforcement shall have a minimum yield strength of 60,000 psi (414 Mpa).
3. The specified location of the reinforcement shall equal or exceed the effective depth distance, d , noted in Tables 4805.5(2), 4805.5(3) and 4805.5(4) 1807.1.6.3(2), 1807.1.6.3(3) and 1807.1.6.3(4) and shall be measured from the face of the exterior (soil) side of the wall to the center of the vertical reinforcement. The reinforcement shall be placed within the tolerances specified in ACI 530.1/ASCE 6/TMS 402, Article 3.4 B7 of the specified location.
4. Grout shall comply with Section 2103.12.
5. Concrete masonry units shall comply with ASTM C 90.
6. Clay masonry units shall comply with ASTM C 652 for hollow brick, except compliance with ASTM C 62 or C 216 is shall be permitted ~~when~~ where solid masonry units are installed in accordance with Table 4805.5(4) 1807.1.6.3(1) for plain masonry.
7. Masonry units shall be laid in running bond and installed with Type M or S mortar in accordance with Section 2103.8.
8. The unfactored axial load per linear foot of wall shall not exceed $1.2 t f'_m$ where t is the specified wall thickness in inches and f'_m is the specified compressive strength of masonry in pounds per square inch.
9. At least 4 inches (102 mm) of solid masonry shall be provided at girder supports at the top of hollow masonry unit foundation walls.
10. Corbeling of masonry shall be in accordance with Section 2104.2. Where an 8-inch (203 mm) wall is corbeled, the top corbel shall not extend higher than the bottom of the floor framing and shall be a full course of headers at least 6 inches (152 mm) in length or the top course bed joint shall be tied to the vertical wall projection. The tie shall be W2.8 (4.8 mm) and spaced at a maximum horizontal distance of 36 inches (914 mm). The hollow space behind the corbelled masonry shall be filled with mortar or grout.

4805.5.3 1807.1.6.3.1 Alternative foundation wall reinforcement. In lieu of the reinforcement provisions for masonry foundation walls in Table 4805.5(2), 4805.5(3) or 4805.5(4) 1807.1.6.3(2), 1807.1.6.3(3) or 1807.1.6.3(4), alternative reinforcing bar sizes and spacings having an equivalent cross-sectional area of reinforcement per linear foot (mm) of wall ~~are~~ shall be permitted to be used, provided the spacing of reinforcement does not exceed 72 inches (1829 mm) and reinforcing bar sizes do not exceed No. 11.

4805.5.4 Hollow masonry walls. At least 4 inches (102 mm) of solid masonry shall be provided at girder supports at the top of hollow masonry unit foundation walls.

4805.5.5 Seismic requirements. Tables 1805.5(1) through 1805.5(5) shall be subject to the following limitations in Sections 1805.5.5.1 and 1805.5.5.2 based on the seismic design category assigned to the structure as defined in Section 1613.

4805.5.5.2 1807.1.6.3.2 Seismic requirements for masonry foundation walls. Based on the seismic design category assigned to the structure in accordance with Section 1613, masonry foundation walls designed using Tables 4805.5(1) through 4805.5(4) 1807.1.6.3(1) through 1807.1.6.3(4) shall be subject to the following limitations:

1. Seismic Design Categories A and B. No additional seismic requirements.
2. Seismic Design Category C. A design using Tables 4805.5(1) through 4805.5(4) 1807.1.6.3(1) through 1807.1.6.3(4) is subject to the seismic requirements of Section 2106.4.
3. Seismic Design Category D. A design using Tables 4805.2(2) through 4805.5(4) 1807.1.6.3(2) through 1807.1.6.3(4) is subject to the seismic requirements of Section 2106.5.
4. Seismic Design Categories E and F. A design using Tables 4805.2(2) through 4805.5(4) 1807.1.6.3(2) through 1807.1.6.3(4) is subject to the seismic requirements of Section 2106.6.

(Renumber remaining sections)

TABLE 4805.5(4) 1807.1.6.3(1)
PLAIN MASONRY FOUNDATION WALLS ^{a, b, c}

MAXIMUM WALL HEIGHT (feet)	MAXIMUM UNBALANCED BACKFILL HEIGHT ^e (feet)	MINIMUM NOMINAL WALL THICKNESS (inches)		
		Soil classes and Design lateral soil load ^a (psf per foot below natural grade of depth)		
		GW, GP, SW and SP soils 30 ^f	GM, GC, SM, SM-SC and ML soils 45 ^f	SC, ML-CL and Inorganic-CL soils 60
7	4 (or less)	8	8	8
	5	8	10	10
	6	10	12	10 (solid ^c)
	7	12	10 (solid ^c)	10 (solid ^c)
	8	10 (solid ^c)	12 (solid ^c)	Note d
8	4 (or less)	8	8	8
	5	8	10	12
	6	10	12	12 (solid ^c)
	7	12	12 (solid ^c)	Note d
	8	10 (solid ^c)	12 (solid ^c)	Note d
9	4 (or less)	8	8	8
	5	8	10	12
	6	12	12	12 (solid ^c)
	7	12 (solid ^c)	12 (solid ^c)	Note d
	8	12 (solid ^c)	Note d	Note d
	9 ^f	Note d	Note d	Note d

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound per square foot per foot = 0.157 kPa/m.

- a. For design lateral soil loads, see Section 1610. Soil classes are in accordance with the Unified Soil Classification System and design lateral soil loads are for moist soil conditions without hydrostatic pressure.
- b. Provisions for this table are based on design and construction requirements specified in Section 4805.5.2.2 1807.1.6.3.
- c. Solid grouted hollow units or solid masonry units.
- d. A design in compliance with Chapter 21 or reinforcement in accordance with Table 4805.5(2) 1807.1.6.3(2) is required.
- e. For height of unbalanced backfill, see Section 4805.5.1.2 1807.1.2.
- f. Where unbalanced backfill height exceeds 8 feet and design lateral soil loads from Table 1610.1 are used, the requirements for 30 and 45 psf per foot of depth are not applicable. See Section 1610.

TABLE 1805.5(2) 1807.1.6.3(2)
8-INCH MASONRY FOUNDATION WALLS WITH REINFORCEMENT WHERE $d \geq 5$ INCHES^{a, b, c}

MAXIMUM WALL HEIGHT (feet-inches)	MAXIMUM UNBALANCED BACKFILL HEIGHT ^d (feet-inches)	VERTICAL REINFORCEMENT		
		Soil classes and Design lateral soil load ^a (psf per foot below natural grade of depth)		
		GW, GP, SW and SP soils 30 ^e	GM, GC, SM, SM-SC and ML soils 45 ^e	SC, ML-CL and Inorganic-CL soils 60
7-4	4-0 (or less)	#4 at 48" o.c.	#4 at 48" o.c.	#4 at 48" o.c.
	5-0	#4 at 48" o.c.	#4 at 48" o.c.	#4 at 48" o.c.
	6-0	#4 at 48" o.c.	#5 at 48" o.c.	#5 at 48" o.c.
	7-4	#5 at 48" o.c.	#6 at 48" o.c.	#7 at 48" o.c.
8-0	4-0 (or less)	#4 at 48" o.c.	#4 at 48" o.c.	#4 at 48" o.c.
	5-0	#4 at 48" o.c.	#4 at 48" o.c.	#4 at 48" o.c.
	6-0	#4 at 48" o.c.	#5 at 48" o.c.	#5 at 48" o.c.
	7-0	#5 at 48" o.c.	#6 at 48" o.c.	#7 at 48" o.c.
8-8	4-0 (or less)	#4 at 48" o.c.	#4 at 48" o.c.	#4 at 48" o.c.
	5-0	#4 at 48" o.c.	#4 at 48" o.c.	#5 at 48" o.c.
	6-0	#4 at 48" o.c.	#5 at 48" o.c.	#6 at 48" o.c.
	7-0	#5 at 48" o.c.	#6 at 48" o.c.	#7 at 48" o.c.
9-4	4-0 (or less)	#4 at 48" o.c.	#4 at 48" o.c.	#4 at 48" o.c.
	5-0	#4 at 48" o.c.	#4 at 48" o.c.	#5 at 48" o.c.
	6-0	#4 at 48" o.c.	#5 at 48" o.c.	#6 at 48" o.c.
	7-0	#5 at 48" o.c.	#6 at 48" o.c.	#7 at 48" o.c.
10-0	4-0 (or less)	#4 at 48" o.c.	#4 at 48" o.c.	#4 at 48" o.c.
	5-0	#4 at 48" o.c.	#4 at 48" o.c.	#5 at 48" o.c.
	6-0	#4 at 48" o.c.	#5 at 48" o.c.	#6 at 48" o.c.
	7-0	#5 at 48" o.c.	#6 at 48" o.c.	#7 at 48" o.c.
	8-0	#6 at 48" o.c.	#7 at 48" o.c.	#8 at 48" o.c.
	9-0 ^e	#7 at 48" o.c.	#8 at 48" o.c.	#9 at 48" o.c.
	10-0 ^e	#7 at 48" o.c.	#9 at 48" o.c.	#9 at 48" o.c.

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound per square foot per foot = 0.157 kPa/m.

- a. For design lateral soil loads, see Section 1610. Soil classes are in accordance with the Unified Soil Classification System and design lateral soil loads are for moist soil conditions without hydrostatic pressure.
- b. Provisions for this table are based on design and construction requirements specified in Section 1805.5.2.2 1807.1.6.3.
- c. For alternative reinforcement, see Section 1805.5.3 1807.1.6.3.1.
- d. For height of unbalanced backfill, see Section 1805.5.4.2 1807.1.2.
- e. Where unbalanced backfill height exceeds 8 feet and design lateral soil loads from Table 1610.1 are used, the requirements for 30 and 45 psf per foot of depth are not applicable. See Section 1610.

TABLE 1805.5(3) 1807.1.6.3(3)
10-INCH MASONRY FOUNDATION WALLS WITH REINFORCEMENT WHERE $d \geq 6.75$ INCHES^{a, b, c}

MAXIMUM WALL HEIGHT (feet-inches)	MAXIMUM UNBALANCED BACKFILL HEIGHT ^d (feet-inches)	VERTICAL REINFORCEMENT		
		Soil classes and Design lateral soil load ^a (psf per foot below natural grade of depth)		
		GW, GP, SW and SP soils 30 ^e	GM, GC, SM, SM-SC and ML soils 45 ^e	SC, ML-CL and Inorganic-CL soils 60
7-4	4-0 (or less)	#4 at 56" o.c.	#4 at 56" o.c.	#4 at 56" o.c.
	5-0	#4 at 56" o.c.	#4 at 56" o.c.	#4 at 56" o.c.
	6-0	#4 at 56" o.c.	#4 at 56" o.c.	#5 at 56" o.c.
	7-4	#4 at 56" o.c.	#5 at 56" o.c.	#6 at 56" o.c.
8-0	4-0 (or less)	#4 at 56" o.c.	#4 at 56" o.c.	#4 at 56" o.c.
	5-0	#4 at 56" o.c.	#4 at 56" o.c.	#4 at 56" o.c.
	6-0	#4 at 56" o.c.	#4 at 56" o.c.	#5 at 56" o.c.
	7-0	#4 at 56" o.c.	#5 at 56" o.c.	#6 at 56" o.c.
8-8	4-0 (or less)	#4 at 56" o.c.	#4 at 56" o.c.	#4 at 56" o.c.
	5-0	#4 at 56" o.c.	#4 at 56" o.c.	#4 at 56" o.c.
	6-0	#4 at 56" o.c.	#4 at 56" o.c.	#5 at 56" o.c.
	7-0	#4 at 56" o.c.	#5 at 56" o.c.	#6 at 56" o.c.
9-4	4-0 (or less)	#4 at 56" o.c.	#4 at 56" o.c.	#4 at 56" o.c.
	5-0	#4 at 56" o.c.	#4 at 56" o.c.	#4 at 56" o.c.
	6-0	#4 at 56" o.c.	#5 at 56" o.c.	#5 at 56" o.c.
	7-0	#4 at 56" o.c.	#5 at 56" o.c.	#6 at 56" o.c.
	8-0	#5 at 56" o.c.	#6 at 56" o.c.	#7 at 56" o.c.
	9-4 ^e	#6 at 56" o.c.	#7 at 56" o.c.	#8 at 56" o.c.

MAXIMUM WALL HEIGHT (feet-inches)	MAXIMUM UNBALANCED BACKFILL HEIGHT ^d (feet-inches)	VERTICAL REINFORCEMENT		
		Soil classes and Design lateral soil load ^a (psf per foot below natural grade of depth)		
		GW, GP, SW and SP soils 30 ^e	GM, GC, SM, SM-SC and ML soils 45 ^e	SC, ML-CL and Inorganic CL soils 60
10-0	4-0 (or less)	#4 at 56" o.c.	#4 at 56" o.c.	#4 at 56" o.c.
	5-0	#4 at 56" o.c.	#4 at 56" o.c.	#4 at 56" o.c.
	6-0	#4 at 56" o.c.	#5 at 56" o.c.	#5 at 56" o.c.
	7-0	#5 at 56" o.c.	#6 at 56" o.c.	#7 at 56" o.c.
	8-0	#5 at 56" o.c.	#7 at 56" o.c.	#8 at 56" o.c.
	9-0 ^e 10-0 ^e	#6 at 56" o.c. #7 at 56" o.c.	#7 at 56" o.c. #8 at 56" o.c.	#9 at 56" o.c. #9 at 56" o.c.

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound per square foot per foot = 0.157 kPa/m.

- a. For design lateral soil loads, see Section 1610. Soil classes are in accordance with the Unified Soil Classification System and design lateral soil loads are for moist soil conditions without hydrostatic pressure.
- b. Provisions for this table are based on design and construction requirements specified in Section 4805.5.2.2 1807.1.6.3.
- c. For alternative reinforcement, see Section 4805.5.3 1807.1.6.3.1.
- d. For height of unbalanced backfill, see Section 4805.5.1.2 1807.1.2.
- e. Where unbalanced backfill height exceeds 8 feet and design lateral soil loads from Table 1610.1 are used, the requirements for 30 and 45 psf per foot of depth are not applicable. See Section 1610.

TABLE 1805.5(4) 1807.1.6.3(4)
12-INCH MASONRY FOUNDATION WALLS WITH REINFORCEMENT WHERE d ≥ 8.75 INCHES^{a, b, c}

MAXIMUM WALL HEIGHT (feet-inches)	MAXIMUM UNBALANCED BACKFILL HEIGHT ^d (feet-inches)	VERTICAL REINFORCEMENT		
		Soil classes and Design lateral soil load ^a (psf per foot below natural grade of depth)		
		GW, GP, SW and SP soils 30 ^e	GM, GC, SM, SM-SC and ML soils 45 ^e	SC, ML-CL and Inorganic CL soils 60
7-4	4-0 (or less)	#4 at 72" o.c.	#4 at 72" o.c.	#4 at 72" o.c.
	5-0	#4 at 72" o.c.	#4 at 72" o.c.	#4 at 72" o.c.
	6-0	#4 at 72" o.c.	#4 at 72" o.c.	#5 at 72" o.c.
	7-4	#4 at 72" o.c.	#5 at 72" o.c.	#6 at 72" o.c.
8-0	4-0 (or less)	#4 at 72" o.c.	#4 at 72" o.c.	#4 at 72" o.c.
	5-0	#4 at 72" o.c.	#4 at 72" o.c.	#4 at 72" o.c.
	6-0	#4 at 72" o.c.	#4 at 72" o.c.	#5 at 72" o.c.
	7-0 8-0	#4 at 72" o.c. #5 at 72" o.c.	#5 at 72" o.c. #6 at 72" o.c.	#6 at 72" o.c. #7 at 72" o.c.
8-8	4-0 (or less)	#4 at 72" o.c.	#4 at 72" o.c.	#4 at 72" o.c.
	5-0	#4 at 72" o.c.	#4 at 72" o.c.	#4 at 72" o.c.
	6-0	#4 at 72" o.c.	#4 at 72" o.c.	#5 at 72" o.c.
	7-0 8-8 ^e	#4 at 72" o.c. #5 at 72" o.c.	#5 at 72" o.c. #7 at 72" o.c.	#6 at 72" o.c. #8 at 72" o.c.
9-4	4-0 (or less)	#4 at 72" o.c.	#4 at 72" o.c.	#4 at 72" o.c.
	5-0	#4 at 72" o.c.	#4 at 72" o.c.	#4 at 72" o.c.
	6-0	#4 at 72" o.c.	#5 at 72" o.c.	#5 at 72" o.c.
	7-0	#4 at 72" o.c.	#5 at 72" o.c.	#6 at 72" o.c.
	8-0 9-4 ^e	#5 at 72" o.c. #6 at 72" o.c.	#6 at 72" o.c. #7 at 72" o.c.	#7 at 72" o.c. #8 at 72" o.c.
10-0	4-0 (or less)	#4 at 72" o.c.	#4 at 72" o.c.	#4 at 72" o.c.
	5-0	#4 at 72" o.c.	#4 at 72" o.c.	#4 at 72" o.c.
	6-0	#4 at 72" o.c.	#5 at 72" o.c.	#5 at 72" o.c.
	7-0	#4 at 72" o.c.	#6 at 72" o.c.	#6 at 72" o.c.
	8-0	#5 at 72" o.c.	#6 at 72" o.c.	#7 at 72" o.c.
	9-0 ^e 10-0 ^e	#6 at 72" o.c. #7 at 72" o.c.	#7 at 72" o.c. #8 at 72" o.c.	#8 at 72" o.c. #9 at 72" o.c.

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound per square foot per foot = 0.157 kPa/m.

- a. For design lateral soil loads, see Section 1610. Soil classes are in accordance with the Unified Soil Classification System and design lateral soil loads are for moist soil conditions without hydrostatic pressure.
- b. Provisions for this table are based on design and construction requirements specified in Section 4805.5.2.2 1807.1.6.3.
- c. For alternative reinforcement, see Section 4805.5.3 1807.1.6.3.1.
- d. For height of unbalanced backfill, see Section 4805.5.1.2 1807.1.2.
- e. Where unbalanced backfill height exceeds 8 feet and design lateral soil loads from Table 1610.1 are used, the requirements for 30 and 45 psf per foot of depth are not applicable. See Section 1610.

**SECTION 1806
RETAINING WALLS**

1807.2 Retaining walls. Retaining walls shall be designed in accordance with Sections 1807.2.1 through 1807.2.3.

4806.4 1807.2.1 General. Retaining walls shall be designed to ensure stability against overturning, sliding, excessive foundation pressure and water uplift.

1807.2.2 Design lateral soil loads. Retaining walls shall be designed for the lateral soil loads set forth in Section 1610.

~~1807.2.3 Safety factor.~~ Retaining walls shall be designed for to resist the lateral action of soil to produce sliding and overturning with a safety factor of 1.5 against lateral sliding and overturning. The load combinations of Section 1605.3 shall not apply to these requirements.

~~1805.7 1807.3 Designs employing lateral bearing~~ **Embedded posts and poles.** Designs to resist both axial and lateral loads employing posts or poles as columns embedded in earth or embedded in concrete footings in the earth shall conform to the requirements of be in accordance with Sections 1805.7.1 through 1805.7.3 1807.3.1 through 1807.3.3.

~~1805.7.4~~ **1807.3.1 Limitations.** The design procedures outlined in this section are subject to the following limitations:

1. The frictional resistance for structural walls and slabs on silts and clays shall be limited to one-half of the normal force imposed on the soil by the weight of the footing or slab.
2. Posts embedded in earth shall not be used to provide lateral support for structural or nonstructural materials such as plaster, masonry or concrete unless bracing is provided that develops the limited deflection required.

Wood poles shall be treated in accordance with AWP A U1 for sawn timber posts (Commodity Specification A, Use Category 4B), and for round timber posts (Commodity Specification B, Use Category 4B).

~~1805.7.2~~ **1807.3.2 Design criteria.** The depth to resist lateral loads shall be determined by using the design criteria established in Sections ~~1805.7.2.1 through 1805.7.2.3~~ 1807.3.2.1 through 1807.3.2.3, or by other methods approved by the building official.

~~1805.7.2.4~~ **1807.3.2.1 Nonconstrained.** The following formula shall be used in determining the depth of embedment required to resist lateral loads where no lateral constraint is provided at the ground surface, such as by a rigid floor or rigid ground surface pavement, and where no lateral constraint is provided above the ground surface, such as by a structural diaphragm.

$$d = 0.5 A \{1 + [1 + (4.36 h / A)]^{1/2}\} \quad \text{(Equation 18-1)}$$

where:

- A = 2.34 P / S₁ b.
- b = Diameter of round post or footing or diagonal dimension of square post or footing, feet (m).
- d = Depth of embedment in earth in feet (m) but not over 12 feet (3658 mm) for purpose of computing lateral pressure.
- h = Distance in feet (m) from ground surface to point of application of "P."
- P = Applied lateral force in pounds (kN).
- S₁ = Allowable lateral soil-bearing pressure as set forth in Section 1804.3 based on a depth of one-third the depth of embedment in pounds per square foot (psf) (kPa).

~~1805.7.2.2~~ **1807.3.2.2 Constrained.** The following formula shall be used to determine the depth of embedment required to resist lateral loads where lateral constraint is provided at the ground surface, such as by a rigid floor or pavement.

$$d^2 = 4.25 (P h / S_3 b) \quad \text{(Equation 18-2)}$$

or alternatively

$$d^2 = 4.25 (M_g / S_3 b) \quad \text{(Equation 18-3)}$$

where:

- M_g = Moment in the post at grade, in foot-pounds (kN-m).
- S₃ = Allowable lateral soil-bearing pressure as set forth in Section 1804.3 based on a depth equal to the depth of embedment in pounds per square foot (kPa).

~~1805.7.2.3~~ **1807.3.2.3 Vertical load.** The resistance to vertical loads shall be determined by using the allowable soil-bearing vertical foundation pressure set forth in Table 1804.2.

~~1805.7.3~~ **1807.3.3 Backfill.** The backfill in the annular space around columns not embedded in poured footings shall be by one of the following methods:

1. Backfill shall be of concrete with an ultimate strength of 2,000 psi (13.8 MPa) at 28 days. The hole shall not be less than 4 inches (102 mm) larger than the diameter of the column at its bottom or 4 inches (102 mm) larger than the diagonal dimension of a square or rectangular column.
2. Backfill shall be of clean sand. The sand shall be thoroughly compacted by tamping in layers not more than 8 inches (203 mm) in depth.
3. Backfill shall be of controlled low-strength material (CLSM).

Delete without substitution:

~~1805.5.6 Foundation wall drainage.~~ Foundation walls shall be designed to support the weight of the full hydrostatic pressure of undrained backfill unless a drainage system is installed in accordance with Sections 1807.4.2 and 1807.4.3.

~~1805.6 Foundation plate or sill bolting.~~ Wood foundation plates or sills shall be bolted or strapped to the foundation or foundation wall as provided in Chapter 23.

Committee Action:

Approved as Modified

Modify proposal as follows:

1610.1 General. Foundation walls and retaining walls shall be designed to resist lateral soil loads. Soil loads specified in Table 1610.1 shall be used as the minimum design lateral soil loads unless specified otherwise in a soil investigation report approved by the building official. Foundation walls and other walls in which horizontal movement is restricted at the top shall be designed for at-rest pressure. Retaining walls free to move and

rotate at the top shall be permitted to be designed for active pressure. Design lateral pressure from surcharge loads shall be added to the lateral earth pressure load. Design lateral pressure shall be increased if soils at the site are expansive. Foundation walls shall be designed to support the weight of the full hydrostatic pressure of undrained backfill unless a drainage system is installed in accordance with Sections ~~1807.4.2 and 1807.4.3~~ 1805.4.2 and 1805.4.3.

Exception: Foundation walls extending not more than 8 feet (2438 mm) below grade and laterally supported at the top by flexible diaphragms shall be permitted to be designed for active pressure.

1807.1.6.2.1 Seismic requirements. Based on the seismic design category assigned to the structure in accordance with Section 1613, concrete foundation walls designed using Table 1807.1.6.2 shall be subject to the following limitations:

1. Seismic Design Categories A and B. No additional seismic requirements, except provide reinforcement around openings in accordance with Section 1909.6.3, not less than two No. 5 bars around window and door openings. Such bars shall extend at least 24 inches (610 mm) beyond the corners of the openings.
2. Seismic Design Categories C, D, E and F. Tables shall not be used except as allowed for plain concrete members in Section 1908.1.15.

1807.2.3 Safety factor. Retaining walls shall be designed to resist the lateral action of soil to produce sliding and overturning with a minimum safety factor of 1.5 in each case. The load combinations of Section 1605-3 shall not apply to ~~these requirements~~ this requirement. Instead, design shall be based on 0.7 times nominal earthquake loads, 1.0 times other nominal loads, and investigation with one or more of the variable loads set to zero.

1807.3.2.1 Nonconstrained. The following formula shall be used in determining the depth of embedment required to resist lateral loads where no lateral constraint is provided at the ground surface, such as by a rigid floor or rigid ground surface pavement, and where no lateral constraint is provided above the ground surface, such as by a structural diaphragm.

$$d = 0.5 A \{1 + [1 + (4.36 h / A)]^{1/2}\} \quad \text{(Equation 18-1)}$$

where:

$A = 2.34 P / S_1 b$.

$b =$ Diameter of round post or footing or diagonal dimension of square post or footing, feet (m).

$d =$ Depth of embedment in earth in feet (m) but not over 12 feet (3658 mm) for purpose of computing lateral pressure.

$h =$ Distance in feet (m) from ground surface to point of application of "P."

$P =$ Applied lateral force in pounds (kN).

$S_1 =$ Allowable lateral soil-bearing pressure as set forth in Section ~~1804.3~~ 1806.2 based on a depth of one-third the depth of embedment in pounds per square foot (psf) (kPa).

1807.3.2.2 Constrained. The following formula shall be used to determine the depth of embedment required to resist lateral loads where lateral constraint is provided at the ground surface, such as by a rigid floor or pavement.

$$d^2 = 4.25 (P h / S_3 b) \quad \text{(Equation 18-2)}$$

or alternatively

$$d^2 = 4.25 (M_g / S_3 b) \quad \text{(Equation 18-3)}$$

where:

$M_g =$ Moment in the post at grade, in foot-pounds (kN-m).

$S_3 =$ Allowable lateral soil-bearing pressure as set forth in Section ~~1804.3~~ 1806.2 based on a depth equal to the depth of embedment in pounds per square foot (kPa).

1807.3.2.3 Vertical load. The resistance to vertical loads shall be determined using the vertical foundation pressure set forth in Table ~~1804.2~~ 1806.2.

(Portions of proposal not shown remain unchanged)

Committee Reason: The approval is consistent with other committee actions on proposals that reformat Chapter 18. The modification provides correlation of section references with other approved code changes. The modification to Section 1807.1.6.2.1 provides coordination with Chapter 19 requirements. The modification to Section 1807.2.3 makes editorial changes, clarifies that 0.7 times the earthquake load should be used and coordinates this section with Section 1605.

Assembly Action:

None

Final Hearing Results

S149-07/08

AM

Code Change No: **S150-07/08**

Original Proposal

Sections: 1801.2, 1801.2.1, 1805, 1808, 1809, 1809.2.1, 1908.2.2.5, 1809.2.3.5, 1810.1.1, 1810.1.3, 1810.2.5, 1810.3.4, 1810.4.4, 1810.6.5, 1812.3, 1812.5, 1812.10, 1812.7, 1808.2.23.2, 1809.2.3.1, 1810.3.4, 1810.5.4, 1810.6.4, 1810.7.2, 1810.7.4, 1810.7.6, 1810.8.2

Proponent: Edwin T. Huston, Smith & Huston, Inc., representing the National Council of Structural Engineering Associations

1. Revise as follows:

1801.2 Design basis. Allowable bearing pressures, allowable stresses and design formulas provided in this chapter shall be used with the allowable stress design load combinations specified in Section 1605.3. The quality and design of materials used structurally in excavations, ~~footings~~ and foundations shall ~~conform to~~ comply with the requirements specified in Chapters 16, 19, 21, 22 and 23 of this code. Excavations and fills shall also comply with Chapter 33.

**SECTION ~~1805~~ 1808
FOOTINGS AND FOUNDATIONS**

1808.1 General. Foundations shall be designed and constructed in accordance with Sections 1808.2 through 1808.9. Shallow foundations shall also satisfy the requirements of Section 1809. Deep foundations shall also satisfy the requirements of Section 1810.

~~1805.4 Footings.~~ Footings shall be designed and constructed in accordance with Sections 1805.4.1 through 1805.4.6.

~~1805.4.1~~ **1808.2 Design for capacity and settlement.** ~~Footings~~ Foundations shall be so designed that the allowable bearing capacity of the soil is not exceeded, and that differential settlement is minimized. ~~The minimum width of footings shall be 12 inches (305 mm).~~ ~~Footings~~ Foundations in areas with expansive soils shall be designed in accordance with the provisions of Section ~~1805.8~~ 1808.6.

~~1805.4.1.1~~ **1808.3 Design loads.** ~~Footings~~ Foundations shall be designed for the most unfavorable effects due to the combinations of loads specified in Section 1605.2 or 1605.3. The dead load is permitted to include the weight of foundations, ~~footings~~ and overlying fill. Reduced live loads, as specified in Sections 1607.9 and 1607.11, ~~are~~ shall be permitted to be used in the design of ~~footings~~ foundations.

~~1801.2.1~~ **1808.3.1 Foundation design for Seismic overturning.** Where ~~the foundation is~~ foundations are proportioned using the load combinations of Section 1605.2, and the computation of seismic overturning ~~moment effects~~ is by ~~the~~ Equivalent Lateral Force method Analysis or the Modal Analysis method, the proportioning shall be in accordance with Section 12.13.4 of ASCE 7.

~~1805.4.1.2~~ **1808.4 Vibratory loads.** Where machinery operations or other vibrations are transmitted through the foundation, consideration shall be given in the ~~footing~~ foundation design to prevent detrimental disturbances of the soil.

~~1805.2.3~~ **1808.5 Shifting or moving soils.** Where it is known that the shallow subsoils are of a shifting or moving character, ~~footings~~ foundations shall be carried to a sufficient depth to ensure stability.

~~1805.8~~ **1808.6 Design for expansive soils.** ~~Footings or~~ Foundations for buildings and structures founded on expansive soils shall be designed in accordance with Section ~~1805.8.1 or 1805.8.2~~ 1808.6.1 or 1808.6.2.

Exception: ~~Footings or~~ Foundation design need not comply with Section ~~1805.8.1 or 1805.8.2~~ 1808.6.1 or 1808.6.2 where one of the following conditions is satisfied:

1. The soil is removed in accordance with Section ~~1805.8.3, nor where~~ 1808.6.3; or
2. The building official approves stabilization of the soil in accordance with Section ~~1805.8.4~~ 1808.6.4.

~~1805.8.1~~ 1808.6.1 Foundations. ~~Footings or~~ Foundations placed on or within the active zone of expansive soils shall be designed to resist differential volume changes and to prevent structural damage to the supported structure. Deflection and racking of the supported structure shall be limited to that which will not interfere with the usability and serviceability of the structure.

Foundations placed below where volume change occurs or below expansive soil shall comply with the following provisions:

1. Foundations extending into or penetrating expansive soils shall be designed to prevent uplift of the supported structure.
2. Foundations penetrating expansive soils shall be designed to resist forces exerted on the foundation due to soil volume changes or shall be isolated from the expansive soil.

~~1805.8.2~~ 1808.6.2 Slab-on-ground foundations. Moments, shears and deflections for use in designing slab-on-ground, mat or raft foundations on expansive soils shall be determined in accordance with *WRI/CRSI Design of Slab-on-ground Foundations* or *PTI Standard Requirements for Analysis of Shallow Concrete Foundations on Expansive Soils*. Using the moments, shears and deflections determined above, nonprestressed slabs-on-ground, mat or raft foundations on expansive soils shall be designed in accordance with *WRI/CRSI Design of Slab-on-ground Foundations* and post-tensioned slab-on-ground, mat or raft foundations on expansive soils shall be designed in accordance with *PTI Standard Requirements for Design of Shallow Post-tensioned Concrete Foundations on Expansive Soils*. It shall be permitted to analyze and design such slabs by other methods that account for soil-structure interaction, the deformed shape of the soil support, the plate or stiffened plate action of the slab, as well as both center lift and edge lift conditions. Such alternative methods shall be rational and the basis for all aspects and parameters of the method shall be available for peer review.

~~1805.8.3~~ 1808.6.3 Removal of expansive soil. Where expansive soil is removed in lieu of designing ~~footings or~~ foundations in accordance with Section ~~1805.8.1 or 1805.8.2~~ 1808.6.1 or 1808.6.2, the soil shall be removed to a depth sufficient to ensure a constant moisture content in the remaining soil. Fill material shall not contain expansive soils and shall comply with Section 1803.5 or 1803.6.

Exception: Expansive soil need not be removed to the depth of constant moisture, provided the confining pressure in the expansive soil created by the fill and supported structure exceeds the swell pressure.

~~1805.8.4~~ 1808.6.4 Stabilization. Where the active zone of expansive soils is stabilized in lieu of designing ~~footings or~~ foundations in accordance with Section ~~1805.8.1 or 1805.8.2~~ 1808.6.1 or 1808.6.2, the soil shall be stabilized by chemical, dewatering, presaturation or equivalent techniques.

~~1805.3~~ 1808.7 Footings Foundations on or adjacent to slopes. The placement of buildings and structures on or adjacent to slopes steeper than one unit vertical in three units horizontal (33.3-percent slope) shall ~~conform to~~ comply with Sections ~~1805.3.1 through 1805.3.5~~ 1808.7.1 through 1808.7.5.

~~1805.3.4~~ 1808.7.1 Building clearance from ascending slopes. In general, buildings below slopes shall be set a sufficient distance from the slope to provide protection from slope drainage, erosion and shallow failures. Except as provided for in Section ~~1805.3.5~~ 1808.7.5 and Figure ~~1805.3.4~~ 1808.7.1, the following criteria will be assumed to provide this protection. Where the existing slope is steeper than one unit vertical in one unit horizontal (100-percent slope), the toe of the slope shall be assumed to be at the intersection of a horizontal plane drawn from the top of the foundation and a plane drawn tangent to the slope at an angle of 45 degrees (0.79 rad) to the horizontal. Where a retaining wall is constructed at the toe of the slope, the height of the slope shall be measured from the top of the wall to the top of the slope.

**FIGURE ~~1805.3.4~~ 1808.7.1
FOUNDATION CLEARANCES FROM SLOPES**

(No changes to Figure)

~~1805.3.2~~ 1808.7.2 Footing Foundation setback from descending slope surface. ~~Footings~~ Foundations on or adjacent to slope surfaces shall be founded in firm material with an embedment and set back from the slope surface sufficient to provide vertical and lateral support for the ~~footing foundation~~ without detrimental settlement. Except as provided for in Section ~~1805.3.5~~ 1808.7.5 and Figure ~~1805.3.4~~ 1808.7.1, the following setback is deemed adequate to meet the criteria. Where the slope is steeper than 1 unit vertical in 1 unit horizontal (100-percent slope), the required setback shall be measured from an imaginary plane 45 degrees (0.79 rad) to the horizontal, projected upward from the toe of the slope.

~~1805.3.3~~ **1808.7.3 Pools.** The setback between pools regulated by this code and slopes shall be equal to one-half the building footing setback distance required by this section. That portion of the pool wall within a horizontal distance of 7 feet (2134 mm) from the top of the slope shall be capable of supporting the water in the pool without soil support.

~~1805.3.4~~ **1808.7.4 Foundation elevation.** On graded sites, the top of any exterior foundation shall extend above the elevation of the street gutter at point of discharge or the inlet of an approved drainage device a minimum of 12 inches (305 mm) plus 2 percent. Alternate elevations are permitted subject to the approval of the building official, provided it can be demonstrated that required drainage to the point of discharge and away from the structure is provided at all locations on the site.

~~1805.3.5~~ **1808.7.5 Alternate setback and clearance.** Alternate setbacks and clearances are permitted, subject to the approval of the building official. The building official is permitted to require an investigation and recommendation of a registered design professional to demonstrate that the intent of this section has been satisfied. Such an investigation shall include consideration of material, height of slope, slope gradient, load intensity and erosion characteristics of slope material.

~~1805.4.2~~ **1808.8 Concrete footings foundations.** The design, materials and construction of concrete ~~footings~~ foundations shall comply with Sections ~~1805.4.2.1 through 1805.4.2.6~~ 1808.8.1 through 1808.8.6 and the provisions of Chapter 19.

Exception: Where a ~~specific design is not provided~~, concrete footings supporting walls of light-frame construction are ~~permitted to be designed in accordance with Table 1805.4.2 1809.7~~, a specific design in accordance with Chapter 19 is not required.

~~1805.4.2.1~~ **1808.8.1 Concrete or grout strength and mix proportioning.** Concrete ~~or grout in footings foundations~~ shall have a specified compressive strength (f'_c) ~~of not less than 2,500 pounds per square inch (psi) (17 237 kPa) at 28 days~~ the largest applicable value indicated in Table 1808.8.1.

~~1810.1.1~~ **Materials.** Concrete shall have a 28-day specified compressive strength (f'_c) ~~of not less than 2,500 psi (17.24 MPa).~~ Where concrete is placed through a funnel hopper at the top of a deep foundation element ~~the pile~~, the concrete mix shall be designed and proportioned so as to produce a cohesive workable mix having a slump of not less than 4 inches (102 mm) and not more than 6 inches (152 mm). Where concrete ~~or grout~~ is to be pumped, the mix design including slump shall be adjusted to produce a pumpable mixture ~~concrete~~.

**TABLE 1808.8.1
MINIMUM SPECIFIED COMPRESSIVE STRENGTH, f'_c , OF CONCRETE OR GROUT**

CONDITION	SPECIFIED COMPRESSIVE STRENGTH, f'_c
1. <u>Foundations for structures assigned to Seismic Design Category A, B, or C</u>	2,500 psi (17.24 MPa)
2a. <u>Foundations for Group R or U occupancies of light-framed construction, two stories or less in height, assigned to Seismic Design Category D, E, or F</u>	2,500 psi (17.24 MPa)
2b. <u>Foundations for other structures assigned to Seismic Design Category D, E, or F</u>	3,000 psi (20.68 MPa)
3. <u>Precast nonprestressed driven piles</u>	3,000 psi (20.68 MPa)
4. <u>Socketed drilled shafts</u>	4,000 psi (27.58 MPa)
5. <u>Micropiles</u>	4,000 psi (27.58 MPa)
6. <u>Precast prestressed driven piles</u>	5,000 psi (34.48 MPa)

1808.8.2 Concrete cover. The concrete cover provided for prestressed and nonprestressed reinforcement in foundations shall be no less than that specified in Table 1808.8.2. Concrete cover shall be measured from the concrete surface to the outermost surface of the steel to which the cover requirement applies. Where concrete is placed in a temporary or permanent casing or a mandrel, the inside face of the casing or mandrel shall be considered the concrete surface.

**TABLE 1808.8.2
MINIMUM CONCRETE COVER**

FOUNDATION ELEMENT OR CONDITION	MINIMUM COVER
1. <u>Shallow foundations</u>	<u>In accordance with Section 7.7 of ACI 318</u>
2. <u>Precast nonprestressed deep foundation elements</u> ^a <u>Exposed to seawater</u> <u>Not manufactured under plant conditions</u> <u>Manufactured under plant control conditions</u>	<u>3 inches (76 mm)</u> <u>2 inches (51 mm)</u> <u>In accordance with Section 7.7.3 of ACI 318</u>
3. <u>Precast prestressed deep foundation elements</u> <u>Exposed to seawater</u> <u>Other</u>	<u>2.5 inches (64 mm)</u> <u>In accordance with Section 7.7.3 of ACI 318</u>
4. <u>Cast-in-place deep foundation elements not enclosed by a steel pipe, tube, or permanent casing</u>	<u>2.5 inches (64 mm)</u>
5. <u>Cast-in-place deep foundation elements enclosed by a steel pipe, tube, or permanent casing</u>	<u>1 inch (25 mm)</u>
6. <u>Structural steel core within a steel pipe, tube, or permanent casing</u>	<u>2 inches (51 mm)</u>

a. Longitudinal bars spaced less than 1.5 inches (38 mm) clear distance apart shall be considered bundled bars for which the minimum concrete cover shall be equal to that for the equivalent diameter of the bundled bars.

1805.4.2.4 1808.8.3 Placement of concrete. Concrete shall be placed in such a manner as to ensure the exclusion of any foreign matter and to secure a full-sized foundation. Concrete footings shall not be placed through water unless a tremie or other method approved by the building official is used. Where placed under or in the presence of water, the concrete shall be deposited by approved means to ensure minimum segregation of the mix and negligible turbulence of the water. Where depositing concrete from the top of a deep foundation element, the concrete shall be chuted directly into smooth-sided pipes or tubes or poured in a rapid and continuous operation through a funnel hopper centered at the top of the element.

1805.4.2.5 1808.8.4 Protection of concrete. Concrete footings foundations shall be protected from freezing during depositing and for a period of not less than five days thereafter. Water shall not be allowed to flow through the deposited concrete.

1805.4.2.6 1808.8.5 Forming of concrete. Concrete footings foundations are permitted to be cast against the earth where, in the opinion of the building official, soil conditions do not require forming form work. Where forming form work is required, it shall be in accordance with Chapter 6 of ACI 318.

1805.9 1808.8.6 Seismic requirements. See Section 1908 for additional requirements for ~~footings and~~ foundations of structures assigned to Seismic Design Category C, D, E or F.

~~For structures assigned to Seismic Design Category D, E or F, provisions of ACI 318, Sections 21.10.1 to 21.10.3 through 21.10.4, shall apply when where not in conflict with the provisions of Section 1805 Sections 1808 through 1810. Concrete shall have a specified compressive strength of not less than 3,000 psi (20.68 MPa) at 28 days.~~

Exceptions:

- ~~1. Group R or U occupancies of light-framed construction and two stories or less above grade plane are permitted to use concrete with a specified compressive strength of not less than 2,500 psi (17.2 MPa) at 28 days.~~
1. Detached one- and two-family dwellings of light-frame construction and two stories or less above grade plane are not required to comply with the provisions of ACI 318, Sections 21.10.1 through ~~to~~ 21.10.3 21.10.4.
2. Section 21.10.4.4(a) of ACI 318 shall not apply.

~~1812.7~~ **1808.9 Vertical masonry foundation elements.** ~~Where the unsupported height of foundation piers exceeds six times the least dimension, the allowable working stress on piers of unit masonry shall be reduced~~ Vertical masonry foundation elements that are not foundation piers as defined in Section 2102.1 shall be designed as piers, walls, or columns, as applicable, in accordance with ACI 530/ASCE 5/TMS 402.

1809
SHALLOW FOUNDATIONS

~~1805.1~~ **1809.1 (Supp) General.** ~~Footings and Shallow foundations shall be designed and constructed in accordance with Sections 1805.1 through 1805.9~~ 1809.2 through 1809.13.

1809.2 Supporting soils. ~~Footings and Shallow foundations shall be built on undisturbed soil, compacted fill material or controlled low-strength material (CLSM). Compacted fill material shall be placed in accordance with Section 1803.5. CLSM shall be placed in accordance with Section 1803.6.~~

1809.3 Stepped footings. ~~The top surface of footings shall be level. The bottom surface of footings is shall be permitted to have a slope not exceeding one unit vertical in 10 units horizontal (10-percent slope). Footings shall be stepped where it is necessary to change the elevation of the top surface of the footing or where the surface of the ground slopes more than one unit vertical in 10 units horizontal (10-percent slope).~~

~~1805.2~~ **1809.4 Depth and width of footings.** ~~The minimum depth of footings below the undisturbed ground surface shall be 12 inches (305 mm). Where applicable, the depth of footings requirements of Section 1809.5 shall also conform to Sections 1805.2.1 through 1805.2.3~~ be satisfied. The minimum width of footings shall be 12 inches (305 mm).

~~1805.2.4~~ **1809.5 Frost protection.** ~~Except where otherwise protected from frost, foundation walls, piers and other permanent supports of buildings and structures shall be protected from frost by one or more of the following methods:~~

1. Extending below the frost line of the locality;
2. Constructing in accordance with ASCE-32; or
3. Erecting on solid rock.

Exception: Free-standing buildings meeting all of the following conditions shall not be required to be protected:

1. ~~Classified in~~ Assigned to Occupancy Category I, in accordance with Section 1604.5;
2. Area of 600 square feet (56 m²) or less for light-frame construction or 400 square feet (37 m²) or less for other than light-frame construction; and
3. Eave height of 10 feet (3048 mm) or less.

~~Footings~~ Shallow foundations shall not bear on frozen soil unless such frozen condition is of a permanent character.

~~1805.2.2~~ **1809.6 Isolated Location of footings.** ~~Footings on granular soil shall be so located that the line drawn between the lower edges of adjoining footings shall not have a slope steeper than 30 degrees (0.52 rad) with the horizontal, unless the material supporting the higher footing is braced or retained or otherwise laterally supported in an approved manner or a greater slope has been properly established by engineering analysis.~~

1809.7 Prescriptive footings for light-frame construction. Where a specific design is not provided, concrete or masonry-unit footings supporting walls of light-frame construction shall be permitted to be designed in accordance with Table 1809.7.

TABLE 1805.4.2 1809.7
PRESCRIPTIVE FOOTINGS SUPPORTING WALLS OF LIGHT-FRAME CONSTRUCTION ^{a, b, c, d, e}

NUMBER OF FLOORS SUPPORTED BY THE FOOTING ^f	WIDTH OF FOOTING (inches)	THICKNESS OF FOOTING (inches)
1	12	6
2	15	6
3	18	8 ^g

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm.

- a. Depth of footings shall be in accordance with Section ~~1805.2~~ 1809.4.
- b. The ground under the floor ~~is~~ shall be permitted to be excavated to the elevation of the top of the footing.
- c. Interior-stud-bearing walls ~~are~~ shall be permitted to be supported by isolated footings. The footing width and length shall be twice the width shown in this table, and footings shall be spaced not more than 6 feet on center.
- d. See Section 1908 for additional requirements for concrete footings of structures assigned to Seismic Design Category C, D, E or F.
- e. For thickness of foundation walls, see Section 1805.5.
- f. Footings ~~are~~ shall be permitted to support a roof in addition to the stipulated number of floors. Footings supporting roof only shall be as required for supporting one floor.
- g. Plain concrete footings for Group R-3 occupancies ~~are~~ shall be permitted to be 6 inches thick.

~~1805.4.2.3~~ 1809.8 Plain concrete footings. The edge thickness of plain concrete footings supporting walls of other than light-frame construction shall not be less than 8 inches (203 mm) where placed on soil.

Exception: For plain concrete footings supporting Group R-3 occupancies, the edge thickness is permitted to be 6 inches (152 mm), provided that the footing does not extend beyond a distance greater than the thickness of the footing on either side of the supported wall.

~~1805.4.3~~ 1809.9 Masonry-unit footings. The design, materials and construction of masonry-unit footings shall comply with Sections ~~1805.4.3.1 and 1805.4.3.2~~ 1809.9.1 and 1809.9.2, and the provisions of Chapter 21.

Exception: Where a specific design is not provided, masonry-unit footings supporting walls of light-frame construction ~~are~~ shall be permitted to be designed in accordance with Table ~~1805.4.2~~ 1809.7.

~~1805.4.3.1~~ 1809.9.1 Dimensions. Masonry-unit footings shall be laid in Type M or S mortar complying with Section 2103.8 and the depth shall not be less than twice the projection beyond the wall, pier or column. The width shall not be less than 8 inches (203 mm) wider than the wall supported thereon.

~~1805.4.3.2~~ 1809.9.2 Offsets. The maximum offset of each course in brick foundation walls stepped up from the footings shall be 1.5 inches (38 mm) where laid in single courses, and 3 inches (76 mm) where laid in double courses.

~~1805.5.7~~ 1809.10 Pier and curtain wall foundations. Except in Seismic Design Categories D, E and F, pier and curtain wall foundations ~~are~~ shall be permitted to be used to support light-frame construction not more than two stories above grade plane, provided the following requirements are met:

1. All load-bearing walls shall be placed on continuous concrete footings bonded integrally with the exterior wall footings.
2. The minimum actual thickness of a load-bearing masonry wall shall not be less than 4 inches (102 mm) nominal or 3.625 inches (92 mm) actual thickness, and shall be bonded integrally with piers spaced 6 feet (1829 mm) on center (o.c.).
3. Piers shall be constructed in accordance with Chapter 21 and the following:
 - 3.1. The unsupported height of the masonry piers shall not exceed 10 times their least dimension.
 - 3.2. Where structural clay tile or hollow concrete masonry units are used for piers supporting beams and girders, the cellular spaces shall be filled solidly with concrete or Type M or S mortar.

Exception: Unfilled hollow piers ~~are~~ shall be permitted where the unsupported height of the pier is not more than four times its least dimension.
 - 3.3. Hollow piers shall be capped with 4 inches (102 mm) of solid masonry or concrete or the cavities of the top course shall be filled with concrete or grout.
4. The maximum height of a 4-inch (102mm) load-bearing masonry foundation wall supporting wood frame walls and floors shall not be more than 4 feet (1219 mm) in height.
5. The unbalanced fill for 4-inch (102 mm) foundation walls shall not exceed 24 inches (610 mm) for solid masonry, nor 12 inches (305mm) for hollow masonry.

~~1805.4.4~~ 1809.11 Steel grillage footings. Grillage footings of structural steel shapes shall be separated with approved steel spacers and be entirely encased in concrete with at least 6 inches (152 mm) on the bottom and at least 4 inches (102 mm) at all other points. The spaces between the shapes shall be completely filled with concrete or cement grout.

~~1805.4.5~~ 1809.12 Timber footings. Timber footings ~~are~~ shall be permitted for buildings of Type V construction and as otherwise approved by the building official. Such footings shall be treated in accordance with AWPA U1 (Commodity Specification A, Use Category 4B). Treated timbers are not required where placed entirely below

permanent water level, or where used as capping for wood piles that project above the water level over submerged or marsh lands. The compressive stresses perpendicular to grain in untreated timber footings supported upon treated piles shall not exceed 70 percent of the allowable stresses for the species and grade of timber as specified in the AF&PA NDS.

(Re-number Section 1805.4.6)

1805.4.2.2 1809.13 Footing seismic ties. Where a structure is assigned to Seismic Design Category D, E or F in accordance with Section 1613, individual spread footings founded on soil defined in Section 1613.5.2 as Site Class E or F shall be interconnected by ties. Ties shall be capable of carrying, in tension or compression, a force equal to the product of the larger footing load times the seismic coefficient S_{DS} divided by 10 unless it is demonstrated that equivalent restraint is provided by reinforced concrete beams within slabs on grade or reinforced concrete slabs on grade.

1808.2.23.2 Seismic Design Category D, E or F. Where a structure is assigned to Seismic Design Category D, E or F in accordance with Section 1613, the requirements for Seismic Design Category C given in Section 1808.2.23.1 shall be met, in addition to the following. ~~Provisions of ACI 318, Section 21.10.4, shall apply when not in conflict with the provisions of Sections 1808 through 1812. Concrete shall have a specified compressive strength of not less than 3,000 psi (20.68 MPa) at 28 days.~~

Exceptions:

- ~~1. Group R or U occupancies of light framed construction and two stories or less above grade plane are permitted to use concrete with a specified compressive strength of not less than 2,500 psi (17.2 MPa) at 28 days.~~
- ~~2. Detached one and two family dwellings of light frame construction and two stories or less in height are not required to comply with the provisions of ACI 318, Section 21.10.4.~~
- ~~3. Section 21.10.4.4(a) of ACI 318 need not apply to concrete piles.~~

1809.2.3.1 Materials. Prestressing steel shall conform to ASTM A 416. ~~Concrete shall have a 28-day specified compressive strength (f'_c) of not less than 5,000 psi (34.48 MPa).~~

1810.3.4 Reinforcement. For piles installed with a hollow-stem auger, where full-length longitudinal steel reinforcement is placed without lateral ties, the reinforcement shall be placed through the hollow stem of the auger prior to filling the pile with concrete. ~~All pile reinforcement shall have a concrete cover of not less than 2.5 inches (64 mm).~~

Exception: Where physical constraints do not allow the placement of the longitudinal reinforcement prior to filling the pile with concrete or where partial-length longitudinal reinforcement is placed without lateral ties, the reinforcement is allowed to be placed after the piles are completely concreted but while concrete is still in a semifluid state.

1810.5.4 Reinforcement. ~~Reinforcement shall not be placed within 1 inch (25 mm) of the steel shell.~~ Reinforcing shall be required for unsupported pile lengths or where the pile is designed to resist uplift or unbalanced lateral loads.

1810.6.4 Reinforcement. Reinforcement steel shall conform to Section 1810.1.2. ~~Reinforcement shall not be placed within 1 inch (25 mm) of the steel casing.~~

1810.7.2 Materials. Pipe and steel cores shall conform to the material requirements in Section 1809.3. Pipes shall have a minimum wall thickness of 3/8 inch (9.5 mm) and shall be fitted with a suitable steel-driving shoe welded to the bottom of the pipe. ~~Concrete shall have a 28-day specified compressive strength (f'_c) of not less than 4,000 psi (27.58 MPa). The concrete mix shall be designed and proportioned so as to produce a cohesive workable mix with a slump of 4 inches to 6 inches (102 mm to 152 mm).~~

1810.7.4 Structural core. The gross cross-sectional area of the structural steel core shall not exceed 25 percent of the gross area of the caisson. ~~The minimum clearance between the structural core and the pipe shall be 2 inches (51 mm).~~ Where cores are to be spliced, the ends shall be milled or ground to provide full contact and shall be full-depth welded.

1810.7.6 Installation. The rock socket and pile shall be thoroughly cleaned of foreign materials before filling with concrete. Steel cores shall be bedded in cement grout at the base of the rock socket. ~~Concrete shall not be placed through water except where a tremie or other approved method is used.~~

1810.8.2 (Supp) Materials. Grout shall have a specified compressive strength (f'_c) of not less than 4,000 psi (27.58 MPa). The grout mix shall be designed and proportioned so as to produce a pumpable mixture. Reinforcement shall consist of deformed reinforcing bars in accordance with ASTM A 615 Grade 60 or 75 or ASTM A 722 Grade 150.

The steel pipe shall have a minimum wall thickness of 3/16 inch (4.8 mm). Splices shall comply with Section 1808.2.7. The steel pipe shall have a minimum yield strength exceeding 45,000 psi (310 MPa) and a minimum elongation of 15 percent as shown by mill certifications or two coupon test samples per 40,000 pounds (18 160 kg) of pipe.

2. Delete without substitution:

1809.2.2.1 Materials. Concrete shall have a 28-day specified compressive strength (f'_c) of not less than 3,000 psi (20.68 MPa).

1809.2.2.5 Concrete cover. Reinforcement for piles that are not manufactured under plant conditions shall have a concrete cover of not less than 2 inches (51 mm).

Reinforcement for piles manufactured under plant control conditions shall have a concrete cover of not less than 1.25 inches (32 mm) for No. 5 bars and smaller, and not less than 1.5 inches (38 mm) for No. 6 through No. 11 bars except that longitudinal bars spaced less than 1.5 inches (38 mm) clear distance apart shall be considered bundled bars for which the minimum concrete cover shall be equal to that for the equivalent diameter of the bundled bars. Reinforcement for piles exposed to seawater shall have a concrete cover of not less than 3 inches (76 mm).

1809.2.3.5 Concrete cover. Prestressing steel and pile reinforcement shall have a concrete cover of not less than 1-1/4 inches (32 mm) for square piles of 12 inches (305 mm) or smaller size and 1-1/2 inches (38 mm) for larger piles, except that for piles exposed to seawater, the minimum protective concrete cover shall not be less than 2-1/2 inches (64 mm).

1810.1.3 Concrete placement. Concrete shall be placed in such a manner as to ensure the exclusion of any foreign matter and to secure a full-sized shaft. Concrete shall not be placed through water except where a tremie or other approved method is used. When depositing concrete from the top of the pile, the concrete shall not be chuted directly into the pile but shall be poured in a rapid and continuous operation through a funnel hopper centered at the top of the pile.

1810.2.5 Concrete cover. The minimum concrete cover shall be 2-1/2 inches (64 mm) for uncased shafts and 1 inch (25 mm) for cased shafts.

1810.4.4 Concrete cover. Pile reinforcement shall have a concrete cover of not less than 2.5 inches (64 mm), measured from the inside face of the drive casing or mandrel.

1810.6.5 Placing concrete. The placement of concrete shall conform to Section 1810.1.3, but is permitted to be chuted directly into smooth sided pipes and tubes without a centering funnel hopper.

1812.3 Materials. Concrete shall have a 28-day specified compressive strength (f'_c) of not less than 2,500 psi (17.24 MPa). Where concrete is placed through a funnel hopper at the top of the pier, the concrete mix shall be designed and proportioned so as to produce a cohesive workable mix having a slump of not less than 4 inches (102 mm) and not more than 6 inches (152 mm). Where concrete is to be pumped, the mix design including slump shall be adjusted to produce a pumpable concrete.

1812.5 Concrete placement. Concrete shall be placed in such a manner as to ensure the exclusion of any foreign matter and to secure a full-sized shaft. Concrete shall not be placed through water except where a tremie or other approved method is used. When depositing concrete from the top of the pier, the concrete shall not be chuted directly into the pier but shall be poured in a rapid and continuous operation through a funnel hopper centered at the top of the pier.

1812.10 Dewatering. Where piers are carried to depths below water level, the piers shall be constructed by a method that will provide accurate preparation and inspection of the bottom, and the depositing or construction of sound concrete or other masonry in the dry.

Reason: Clarifies the scope of requirements related to design of all foundations and design of shallow foundations. Collects and unifies general requirements (for instance, related to concrete strength, concrete cover, and concrete placement) to reduce unnecessary repetition.

The revisions in new Section 1808.9 fix a conflict in the existing code. The present text refers to masonry foundation piers with an unsupported height that exceeds six times the least dimension. However, Section 2102.1 and ACI 530 define a masonry foundation pier as having a height less than or equal to 4 times its thickness. The revised text directs the reader to the pertinent definition and design requirements. Depending on the dimensions of a vertical masonry element, it is designed as a foundation pier, a pier, a wall, or a column.

Section 1812.10 is deleted because it conflicts with other requirements and unnecessarily restates other requirements. Section 1812.5 permits placement of concrete in water where proper methods are employed, so placement “in the dry” is not required. Requirements for inspection are already set forth in Chapter 17.

Correlation notes: In Section 1704.4 exception item 2.2, change “Table 1805.4.2” to “Table 1809.7”. In Section 1704.4 exception item 4, change “Table 1805.5(5)” to “Table 1807.1.6.2”.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Errata: Replace the entire proposal with the following:

Revise as follows:

1801.2 Design basis. Allowable bearing pressures, allowable stresses and design formulas provided in this chapter shall be used with the allowable stress design load combinations specified in Section 1605.3. The quality and design of materials used structurally in excavations, footings and foundations shall conform to comply with the requirements specified in Chapters 16, 19, 21, 22 and 23 of this code. Excavations and fills shall also comply with Chapter 33.

SECTION ~~1805~~ 1808 FOOTINGS AND FOUNDATIONS

1808.1 General. Foundations shall be designed and constructed in accordance with Sections 1808.2 through 1808.9. Shallow foundations shall also satisfy the requirements of Section 1809. Deep foundations shall also satisfy the requirements of Section 1810.

~~1805.4 Footings.~~ Footings shall be designed and constructed in accordance with Sections 1805.4.1 through 1805.4.6.

~~1805.4.1-1808.2 Design for capacity and settlement.~~ Footings Foundations shall be so designed that the allowable bearing capacity of the soil is not exceeded, and that differential settlement is minimized. ~~The minimum width of footings shall be 12 inches (305 mm).~~ Footings Foundations in areas with expansive soils shall be designed in accordance with the provisions of Section ~~1805.8~~ 1808.6.

~~1805.4.1.4 1808.3 Design loads.~~ Footings Foundations shall be designed for the most unfavorable effects due to the combinations of loads specified in Section 1605.2 or 1605.3. The dead load is permitted to include the weight of foundations, footings and overlying fill. Reduced live loads, as specified in Sections 1607.9 and 1607.11, ~~are shall be~~ permitted to be used in the design of ~~footings foundations~~.

~~1804.2.4 1808.3.1 Foundation design for seismic overturning.~~ Where ~~the foundation is~~ foundations are proportioned using the load combinations of Section 1605.2, and the computation of seismic overturning ~~moment effects~~ is by the Equivalent Lateral Force ~~method~~ Analysis or the Modal Analysis ~~method~~, the proportioning shall be in accordance with Section 12.13.4 of ASCE 7.

~~1805.4.1.2 1808.4 Vibratory loads.~~ Where machinery operations or other vibrations are transmitted through the foundation, consideration shall be given in the ~~footing foundation~~ design to prevent detrimental disturbances of the soil.

~~1805.2.3 1808.5 Shifting or moving soils.~~ Where it is known that the shallow subsoils are of a shifting or moving character, ~~footings foundations~~ shall be carried to a sufficient depth to ensure stability.

~~1805.8 1808.6 Design for expansive soils.~~ Footings or Foundations for buildings and structures founded on expansive soils shall be designed in accordance with Section ~~1805.8.1 or 1805.8.2~~ 1808.6.1 or 1808.6.2.

Exception: Footing or Foundation design need not comply with Section ~~1805.8.1 or 1805.8.2~~ 1808.6.1 or 1808.6.2 where one of the following conditions is satisfied:

1. The soil is removed in accordance with Section ~~1805.8.3, nor where~~ 1808.6.3; or
2. The building official approves stabilization of the soil in accordance with Section ~~1805.8.4~~ 1808.6.4.

~~1805.8.4 1808.6.1 Foundations.~~ Footings or Foundations placed on or within the active zone of expansive soils shall be designed to resist differential volume changes and to prevent structural damage to the supported structure. Deflection and racking of the supported structure shall be limited to that which will not interfere with the usability and serviceability of the structure.

Foundations placed below where volume change occurs or below expansive soil shall comply with the following provisions:

1. Foundations extending into or penetrating expansive soils shall be designed to prevent uplift of the supported structure.
2. Foundations penetrating expansive soils shall be designed to resist forces exerted on the foundation due to soil volume changes or shall be isolated from the expansive soil.

~~1805.8.2 1808.6.2 Slab-on-ground foundations.~~ Moments, shears and deflections for use in designing slab-on-ground, mat or raft foundations on expansive soils shall be determined in accordance with *WRI/CRSI Design of Slab-on-ground Foundations* or *PTI Standard Requirements for Analysis of Shallow Concrete Foundations on Expansive Soils*. Using the moments, shears and deflections determined above, nonprestressed slabs-on-ground, mat or raft foundations on expansive soils shall be designed in accordance with *WRI/CRSI Design of Slab-on-ground Foundations* and post-tensioned slab-on-ground, mat or raft foundations on expansive soils shall be designed in accordance with *PTI Standard*

Requirements for Design of Shallow Post-tensioned Concrete Foundations on Expansive Soils. It shall be permitted to analyze and design such slabs by other methods that account for soil-structure interaction, the deformed shape of the soil support, the plate or stiffened plate action of the slab, as well as both center lift and edge lift conditions. Such alternative methods shall be rational and the basis for all aspects and parameters of the method shall be available for peer review.

1805.8.3 1808.6.3 Removal of expansive soil. Where expansive soil is removed in lieu of designing ~~footings~~ or foundations in accordance with Section ~~1805.8.4 or 1805.8.2~~ 1808.6.1 or 1808.6.2, the soil shall be removed to a depth sufficient to ensure a constant moisture content in the remaining soil. Fill material shall not contain expansive soils and shall comply with Section 1803.5 or 1803.6.

Exception: Expansive soil need not be removed to the depth of constant moisture, provided the confining pressure in the expansive soil created by the fill and supported structure exceeds the swell pressure.

1805.8.4 1808.6.4 Stabilization. Where the active zone of expansive soils is stabilized in lieu of designing ~~footings~~ or foundations in accordance with Section ~~1805.8.4 or 1805.8.2~~ 1808.6.1 or 1808.6.2, the soil shall be stabilized by chemical, dewatering, presaturation or equivalent techniques.

1805.3 1808.7 Footings Foundations on or adjacent to slopes. The placement of buildings and structures on or adjacent to slopes steeper than one unit vertical in three units horizontal (33.3-percent slope) shall ~~conform to~~ comply with Sections ~~1805.3.1 through 1805.3.5~~ 1808.7.1 through 1808.7.5.

1805.3.4 1808.7.1 Building clearance from ascending slopes. In general, buildings below slopes shall be set a sufficient distance from the slope to provide protection from slope drainage, erosion and shallow failures. Except as provided ~~for~~ in Section ~~1805.3.5~~ 1808.7.5 and Figure ~~1805.3.4~~ 1808.7.1, the following criteria will be assumed to provide this protection. Where the existing slope is steeper than one unit vertical in one unit horizontal (100-percent slope), the toe of the slope shall be assumed to be at the intersection of a horizontal plane drawn from the top of the foundation and a plane drawn tangent to the slope at an angle of 45 degrees (0.79 rad) to the horizontal. Where a retaining wall is constructed at the toe of the slope, the height of the slope shall be measured from the top of the wall to the top of the slope.

**FIGURE ~~1805.3.4~~ 1808.7.1
FOUNDATION CLEARANCES FROM SLOPES**

(No changes to Figure)

1805.3.2 1808.7.2 Footing Foundation setback from descending slope surface. ~~Footings Foundations~~ on or adjacent to slope surfaces shall be founded in firm material with an embedment and set back from the slope surface sufficient to provide vertical and lateral support for the ~~footing foundation~~ without detrimental settlement. Except as provided for in Section ~~1805.3.5~~ 1808.7.5 and Figure ~~1805.3.4~~ 1808.7.1, the following setback is deemed adequate to meet the criteria. Where the slope is steeper than 1 unit vertical in 1 unit horizontal (100-percent slope), the required setback shall be measured from an imaginary plane 45 degrees (0.79 rad) to the horizontal, projected upward from the toe of the slope.

1805.3.3 1808.7.3 Pools. The setback between pools regulated by this code and slopes shall be equal to one-half the building footing setback distance required by this section. That portion of the pool wall within a horizontal distance of 7 feet (2134 mm) from the top of the slope shall be capable of supporting the water in the pool without soil support.

1805.3.4 1808.7.4 Foundation elevation. On graded sites, the top of any exterior foundation shall extend above the elevation of the street gutter at point of discharge or the inlet of an approved drainage device a minimum of 12 inches (305 mm) plus 2 percent. Alternate elevations are permitted subject to the approval of the building official, provided it can be demonstrated that required drainage to the point of discharge and away from the structure is provided at all locations on the site.

1805.3.5 1808.7.5 Alternate setback and clearance. Alternate setbacks and clearances are permitted, subject to the approval of the building official. The building official is permitted to require an investigation and recommendation of a registered design professional to demonstrate that the intent of this section has been satisfied. Such an investigation shall include consideration of material, height of slope, slope gradient, load intensity and erosion characteristics of slope material.

1805.4.2 1808.8 Concrete footings foundations. The design, materials and construction of concrete ~~footings~~ foundations shall comply with Sections ~~1805.4.2.1 through 1805.4.2.6~~ 1808.8.1 through 1808.8.6 and the provisions of Chapter 19.

Exception: Where ~~a specific design is not provided~~, concrete footings supporting walls of light-frame construction are ~~permitted to be~~ designed in accordance with Table ~~1805.4.2~~ 1809.7, a specific design in accordance with Chapter 19 is not required.

1805.4.2.4 1808.8.1 Concrete or grout strength and mix proportioning. Concrete or grout in ~~footings~~ foundations shall have a specified compressive strength ($f'c$) of not less than ~~2,500 pounds per square inch (psi) (17-237 kPa)~~ at 28 days the largest applicable value indicated in Table 1808.8.1.

1810.1.1 Materials. Concrete shall have a 28-day specified compressive strength ($f'c$) of not less than 2,500 psi (17.24 MPa). Where concrete is placed through a funnel hopper at the top of ~~a deep foundation element~~ the pile, the concrete mix shall be designed and proportioned so as to produce a cohesive workable mix having a slump of not less than 4 inches (102 mm) and not more than 6 inches (152 mm). Where concrete or grout is to be pumped, the mix design including slump shall be adjusted to produce a pumpable mixture ~~concrete~~.

TABLE 1808.8.1
MINIMUM SPECIFIED COMPRESSIVE STRENGTH, f'_c , OF CONCRETE OR GROUT

CONDITION	SPECIFIED COMPRESSIVE STRENGTH, f'_c
1. Foundations for structures assigned to Seismic Design Category A, B, or C	2,500 psi (17.24 MPa)
2a. Foundations for Group R or U occupancies of light-framed construction, two stories or less in height, assigned to Seismic Design Category D, E, or F	2,500 psi (17.24 MPa)
2b. Foundations for other structures assigned to Seismic Design Category D, E, or F	3,000 psi (20.68 MPa)
3. Precast nonprestressed driven piles	3,000 psi (20.68 MPa)
5. Socketed drilled shafts	4,000 psi (27.58 MPa)
6. Micropiles	4,000 psi (27.58 MPa)
7. Precast prestressed driven piles	5,000 psi (34.48 MPa)

1808.8.2 Concrete cover. The concrete cover provided for prestressed and nonprestressed reinforcement in foundations shall be no less than that specified in Table 1808.8.2. Concrete cover shall be measured from the concrete surface to the outermost surface of the steel to which the cover requirement applies. Where concrete is placed in a temporary or permanent casing or a mandrel, the inside face of the casing or mandrel shall be considered the concrete surface.

TABLE 1808.8.2
MINIMUM CONCRETE COVER

FOUNDATION ELEMENT OR CONDITION	MINIMUM COVER
1. Shallow foundations	In accordance with Section 7.7 of ACI 318
2. Precast nonprestressed deep foundation elements ^a Exposed to seawater Not manufactured under plant conditions Manufactured under plant control conditions	3 inches (76 mm) 2 inches (51 mm) In accordance with Section 7.7.3 of ACI 318
3. Precast prestressed deep foundation elements Exposed to seawater Other	2.5 inches (64 mm) In accordance with Section 7.7.3 of ACI 318
4. Cast-in-place deep foundation elements not enclosed by a steel pipe, tube, or permanent casing	2.5 inches (64 mm)
5. Cast-in-place deep foundation elements enclosed by a steel pipe, tube, or permanent casing	1 inch (25 mm)
6. Structural steel core within a steel pipe, tube, or permanent casing	2 inches (51 mm)

a. Longitudinal bars spaced less than 1.5 inches (38 mm) clear distance apart shall be considered bundled bars for which the minimum concrete cover shall be equal to that for the equivalent diameter of the bundled bars.

1805.4.2.4 1808.8.3 Placement of concrete. Concrete shall be placed in such a manner as to ensure the exclusion of any foreign matter and to secure a full-sized foundation. Concrete ~~footings~~ shall not be placed through water unless a tremie or other method approved by the building official is used. Where placed under or in the presence of water, the concrete shall be deposited by approved means to ensure minimum segregation of the mix and negligible turbulence of the water. ~~Where depositing concrete from the top of a deep foundation element, the concrete shall be chuted directly into smooth-sided pipes or tubes or poured in a rapid and continuous operation through a funnel hopper centered at the top of the element.~~

1805.4.2.5 1808.8.4 Protection of concrete. Concrete ~~footings~~ foundations shall be protected from freezing during depositing and for a period of not less than five days thereafter. Water shall not be allowed to flow through the deposited concrete.

1805.4.2.6 1808.8.5 Forming of concrete. Concrete ~~footings~~ foundations are permitted to be cast against the earth where, in the opinion of the building official, soil conditions do not require ~~forming form work~~. Where ~~forming form work~~ is required, it shall be in accordance with Chapter 6 of ACI 318.

1805.9 1808.8.6 Seismic requirements. See Section 1908 for additional requirements for ~~footings and~~ foundations of structures assigned to Seismic Design Category C, D, E or F.

For structures assigned to Seismic Design Category D, E or F, provisions of ACI 318, Sections 21.10.1 ~~to 21.10.3~~ through 21.10.4, shall apply ~~when where~~ not in conflict with the provisions of ~~Section 1805~~ Sections 1808 through 1810. ~~Concrete shall have a specified compressive strength of not less than 3,000 psi (20.68 MPa) at 28 days.~~

Exceptions:

- Group R or U occupancies of light-framed construction and two stories or less above grade plane are permitted to use concrete with a specified compressive strength of not less than 2,500 psi (17.2 MPa) at 28 days.

1. Detached one- and two-family dwellings of light-frame construction and two stories or less above grade plane are not required to comply with the provisions of ACI 318, Sections 21.10.1 ~~through to 21.10.3~~ 21.10.4.
2. ~~Section 21.10.4.4(a) of ACI 318 shall not apply.~~

~~4812.7~~ **1808.9 Vertical masonry foundation elements.** ~~Where the unsupported height of foundation piers exceeds six times the least dimension, the allowable working stress on piers of unit masonry shall be reduced.~~ Vertical masonry foundation elements that are not foundation piers as defined in Section 2102.1 shall be designed as piers, walls, or columns, as applicable, in accordance with ACI 530/ASCE 5/TMS 402.

1809 SHALLOW FOUNDATIONS

~~4805.4~~ **1809.1 [Supp] General.** ~~Footings and Shallow foundations shall be designed and constructed in accordance with Sections 4805.4 through 4805.9~~ 1809.2 through 1809.13.

1809.2 Supporting soils. ~~Footings and Shallow foundations shall be built on undisturbed soil, compacted fill material or controlled low-strength material (CLSM). Compacted fill material shall be placed in accordance with Section 1803.5. CLSM shall be placed in accordance with Section 1803.6.~~

1809.3 Stepped footings. ~~The top surface of footings shall be level. The bottom surface of footings is shall be permitted to have a slope not exceeding one unit vertical in 10 units horizontal (10-percent slope). Footings shall be stepped where it is necessary to change the elevation of the top surface of the footing or where the surface of the ground slopes more than one unit vertical in 10 units horizontal (10-percent slope).~~

~~4805.2~~ **1809.4 Depth and width of footings.** ~~The minimum depth of footings below the undisturbed ground surface shall be 12 inches (305 mm). Where applicable, the depth of footings requirements of Section 1809.5 shall also conform to Sections 1805.2.1 through 1805.2.3 be satisfied. The minimum width of footings shall be 12 inches (305 mm).~~

~~4805.2.4~~ **1809.5 Frost protection.** ~~Except where otherwise protected from frost, foundation walls, piers and other permanent supports of buildings and structures shall be protected from frost by one or more of the following methods:~~

1. Extending below the frost line of the locality;
2. Constructing in accordance with ASCE-32; or
3. Erecting on solid rock.

Exception: Free-standing buildings meeting all of the following conditions shall not be required to be protected:

1. ~~Classified in~~ Assigned to Occupancy Category I, in accordance with Section 1604.5;
2. Area of 600 square feet (56 m²) or less for light-frame construction or 400 square feet (37 m²) or less for other than light-frame construction; and
3. Eave height of 10 feet (3048 mm) or less.

~~Footings~~ Shallow foundations shall not bear on frozen soil unless such frozen condition is of a permanent character.

~~4805.2.2~~ **1809.6 Isolated Location of footings.** ~~Footings on granular soil shall be so located that the line drawn between the lower edges of adjoining footings shall not have a slope steeper than 30 degrees (0.52 rad) with the horizontal, unless the material supporting the higher footing is braced or retained or otherwise laterally supported in an approved manner or a greater slope has been properly established by engineering analysis.~~

1809.7 Prescriptive footings for light-frame construction. ~~Where a specific design is not provided, concrete or masonry-unit footings supporting walls of light-frame construction shall be permitted to be designed in accordance with Table 1809.7.~~

TABLE 4805.4.2 1809.7
PRESCRIPTIVE FOOTINGS SUPPORTING WALLS OF LIGHT-FRAME CONSTRUCTION ^{a, b, c, d, e}

NUMBER OF FLOORS SUPPORTED BY THE FOOTING ^f	WIDTH OF FOOTING (inches)	THICKNESS OF FOOTING (inches)
1	12	6
2	15	6
3	18	8 ^g

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm.

- a. ~~Depth of footings shall be in accordance with Section 4805.2~~ 1809.4.
- b. ~~The ground under the floor is shall be~~ permitted to be excavated to the elevation of the top of the footing.
- c. ~~Interior-stud-bearing walls are shall be~~ permitted to be supported by isolated footings. The footing width and length shall be twice the width shown in this table, and footings shall be spaced not more than 6 feet on center.
- d. See Section 1908 for additional requirements for concrete footings of structures assigned to Seismic Design Category C, D, E or F.
- e. For thickness of foundation walls, see Section 1805.5.
- f. ~~Footings are shall be~~ permitted to support a roof in addition to the stipulated number of floors. Footings supporting roof only shall be as required for supporting one floor.
- g. ~~Plain concrete footings for Group R-3 occupancies are shall be~~ permitted to be 6 inches thick.

~~4805.4.2.3~~ **1809.8 Plain concrete footings.** ~~The edge thickness of plain concrete footings supporting walls of other than light-frame construction shall not be less than 8 inches (203 mm) where placed on soil.~~

Exception: For plain concrete footings supporting Group R-3 occupancies, the edge thickness is permitted to be 6 inches (152 mm), provided that the footing does not extend beyond a distance greater than the thickness of the footing on either side of the supported wall.

~~4805.4.3~~ **1809.9 Masonry-unit footings.** ~~The design, materials and construction of masonry-unit footings shall comply with Sections 4805.4.3.1 and 4805.4.3.2~~ 1809.9.1 and 1809.9.2, and the provisions of Chapter 21.

Exception: Where a specific design is not provided, masonry-unit footings supporting walls of light-frame construction ~~are shall be~~ permitted to be designed in accordance with Table ~~4805.4.2~~ 1809.7.

1805.4.3.4 1809.9.1 Dimensions. Masonry-unit footings shall be laid in Type M or S mortar complying with Section 2103.8 and the depth shall not be less than twice the projection beyond the wall, pier or column. The width shall not be less than 8 inches (203 mm) wider than the wall supported thereon.

1805.4.3.2 1809.9.2 Offsets. The maximum offset of each course in brick foundation walls stepped up from the footings shall be 1.5 inches (38 mm) where laid in single courses, and 3 inches (76 mm) where laid in double courses.

1805.5.7 1809.10 Pier and curtain wall foundations. Except in Seismic Design Categories D, E and F, pier and curtain wall foundations ~~are~~ shall be permitted to be used to support light-frame construction not more than two stories above grade plane, provided the following requirements are met:

1. All load-bearing walls shall be placed on continuous concrete footings bonded integrally with the exterior wall footings.
2. The minimum actual thickness of a load-bearing masonry wall shall not be less than 4 inches (102 mm) nominal or 3.625 inches (92 mm) actual thickness, and shall be bonded integrally with piers spaced 6 feet (1829 mm) on center (o.c.).
3. Piers shall be constructed in accordance with Chapter 21 and the following:
 - 3.1. The unsupported height of the masonry piers shall not exceed 10 times their least dimension.
 - 3.2. Where structural clay tile or hollow concrete masonry units are used for piers supporting beams and girders, the cellular spaces shall be filled solidly with concrete or Type M or S mortar.

Exception: Unfilled hollow piers ~~are~~ shall be permitted where the unsupported height of the pier is not more than four times its least dimension.

- 3.3. Hollow piers shall be capped with 4 inches (102 mm) of solid masonry or concrete or the cavities of the top course shall be filled with concrete or grout.
4. The maximum height of a 4-inch (102mm) load-bearing masonry foundation wall supporting wood frame walls and floors shall not be more than 4 feet (1219 mm) in height.
5. The unbalanced fill for 4-inch (102 mm) foundation walls shall not exceed 24 inches (610 mm) for solid masonry, nor 12 inches (305mm) for hollow masonry.

1805.4.4 1809.11 Steel grillage footings. Grillage footings of structural steel shapes shall be separated with approved steel spacers and be entirely encased in concrete with at least 6 inches (152 mm) on the bottom and at least 4 inches (102 mm) at all other points. The spaces between the shapes shall be completely filled with concrete or cement grout.

1805.4.5 1809.12 Timber footings. Timber footings ~~are~~ shall be permitted for buildings of Type V construction and as otherwise approved by the building official. Such footings shall be treated in accordance with AWPA U1 (Commodity Specification A, Use Category 4B). Treated timbers are not required where placed entirely below permanent water level, or where used as capping for wood piles that project above the water level over submerged or marsh lands. The compressive stresses perpendicular to grain in untreated timber footings supported upon treated piles shall not exceed 70 percent of the allowable stresses for the species and grade of timber as specified in the AF&PA NDS.

(Renumber Section 1805.4.6)

1805.4.2.2 1809.13 Footing seismic ties. Where a structure is assigned to Seismic Design Category D, E or F in accordance with Section 1613, individual spread footings founded on soil defined in Section 1613.5.2 as Site Class E or F shall be interconnected by ties. Ties shall be capable of carrying, in tension or compression, a force equal to the product of the larger footing load times the seismic coefficient S_{DS} divided by 10 unless it is demonstrated that equivalent restraint is provided by reinforced concrete beams within slabs on grade or reinforced concrete slabs on grade.

1808.2.23.2 Seismic Design Category D, E or F. Where a structure is assigned to Seismic Design Category D, E or F in accordance with Section 1613, the requirements for Seismic Design Category C given in Section 1808.2.23.1 shall be met, in addition to the following. ~~Provisions of ACI 318, Section 21.10.4, shall apply when not in conflict with the provisions of Sections 1808 through 1812. Concrete shall have a specified compressive strength of not less than 3,000 psi (20.68 MPa) at 28 days.~~

Exceptions:

- ~~1. Group R or U occupancies of light-framed construction and two stories or less above grade plane are permitted to use concrete with a specified compressive strength of not less than 2,500 psi (17.2 MPa) at 28 days.~~
- ~~2. Detached one- and two-family dwellings of light-frame construction and two stories or less in height are not required to comply with the provisions of ACI 318, Section 21.10.4.~~
- ~~3. Section 21.10.4.4(a) of ACI 318 need not apply to concrete piles.~~

1809.2.3.1 Materials. Prestressing steel shall conform to ASTM A 416. ~~Concrete shall have a 28-day specified compressive strength (f'_c) of not less than 5,000 psi (34.48 MPa).~~

1810.3.4 Reinforcement. For piles installed with a hollow-stem auger, where full-length longitudinal steel reinforcement is placed without lateral ties, the reinforcement shall be placed through the hollow stem of the auger prior to filling the pile with concrete. ~~All pile reinforcement shall have a concrete cover of not less than 2.5 inches (64 mm).~~

Exception: Where physical constraints do not allow the placement of the longitudinal reinforcement prior to filling the pile with concrete or where partial-length longitudinal reinforcement is placed without lateral ties, the reinforcement is allowed to be placed after the piles are completely concreted but while concrete is still in a semifluid state.

1810.5.4 Reinforcement. ~~Reinforcement shall not be placed within 1 inch (25 mm) of the steel shell.~~ Reinforcing shall be required for unsupported pile lengths or where the pile is designed to resist uplift or unbalanced lateral loads.

1810.6.4 Reinforcement. Reinforcement steel shall conform to Section 1810.1.2. ~~Reinforcement shall not be placed within 1 inch (25 mm) of the steel casing.~~

1810.7.2 Materials. Pipe and steel cores shall conform to the material requirements in Section 1809.3. Pipes shall have a minimum wall thickness of 3/8 inch (9.5 mm) and shall be fitted with a suitable steel-driving shoe welded to the bottom of the pipe. ~~Concrete shall have a 28-day specified compressive strength (f'_c) of not less than 4,000 psi (27.58 MPa). The concrete mix shall be designed and proportioned so as to produce a cohesive workable mix with a slump of 4 inches to 6 inches (102 mm to 152 mm).~~

1810.7.4 Structural core. The gross cross-sectional area of the structural steel core shall not exceed 25 percent of the gross area of the caisson. ~~The minimum clearance between the structural core and the pipe shall be 2 inches (51 mm).~~ Where cores are to be spliced, the ends shall be milled or ground to provide full contact and shall be full-depth welded.

1810.7.6 Installation. The rock socket and pile shall be thoroughly cleaned of foreign materials before filling with concrete. Steel cores shall be bedded in cement grout at the base of the rock socket. ~~Concrete shall not be placed through water except where a tremie or other approved method is used.~~

1810.8.2 [Supp] Materials. ~~Grout shall have a specified compressive strength (f'_c) of not less than 4,000 psi (27.58 MPa). The grout mix shall be designed and proportioned so as to produce a pumpable mixture.~~ Reinforcement shall consist of deformed reinforcing bars in accordance with ASTM A 615 Grade 60 or 75 or ASTM A 722 Grade 150.

The steel pipe shall have a minimum wall thickness of 3/16 inch (4.8 mm). Splices shall comply with Section 1808.2.7. The steel pipe shall have a minimum yield strength exceeding 45,000 psi (310 MPa) and a minimum elongation of 15 percent as shown by mill certifications or two coupon test samples per 40,000 pounds (18 160 kg) of pipe.

Delete without substitution:

~~**1809.2.2.1 Materials.** Concrete shall have a 28-day specified compressive strength (f'_c) of not less than 3,000 psi (20.68 MPa).~~

~~**1809.2.2.5 Concrete cover.** Reinforcement for piles that are not manufactured under plant conditions shall have a concrete cover of not less than 2 inches (51 mm).~~

~~Reinforcement for piles manufactured under plant control conditions shall have a concrete cover of not less than 1.25 inches (32 mm) for No. 5 bars and smaller, and not less than 1.5 inches (38 mm) for No. 6 through No. 11 bars except that longitudinal bars spaced less than 1.5 inches (38 mm) clear distance apart shall be considered bundled bars for which the minimum concrete cover shall be equal to that for the equivalent diameter of the bundled bars. Reinforcement for piles exposed to seawater shall have a concrete cover of not less than 3 inches (76 mm).~~

~~**1809.2.3.5 Concrete cover.** Prestressing steel and pile reinforcement shall have a concrete cover of not less than 1-1/4 inches (32 mm) for square piles of 12 inches (305 mm) or smaller size and 1-1/2 inches (38 mm) for larger piles, except that for piles exposed to seawater, the minimum protective concrete cover shall not be less than 2-1/2 inches (64 mm).~~

~~**1810.1.3 Concrete placement.** Concrete shall be placed in such a manner as to ensure the exclusion of any foreign matter and to secure a full-sized shaft. Concrete shall not be placed through water except where a tremie or other approved method is used. When depositing concrete from the top of the pile, the concrete shall not be chuted directly into the pile but shall be poured in a rapid and continuous operation through a funnel hopper centered at the top of the pile.~~

~~**1810.2.5 Concrete cover.** The minimum concrete cover shall be 2-1/2 inches (64 mm) for uncased shafts and 1 inch (25 mm) for cased shafts.~~

~~**1810.4.4 Concrete cover.** Pile reinforcement shall have a concrete cover of not less than 2.5 inches (64 mm), measured from the inside face of the drive casing or mandrel.~~

~~**1810.6.5 Placing concrete.** The placement of concrete shall conform to Section 1810.1.3, but is permitted to be chuted directly into smooth-sided pipes and tubes without a centering funnel hopper.~~

~~**1812.3 Materials.** Concrete shall have a 28-day specified compressive strength (f'_c) of not less than 2,500 psi (17.24 MPa). Where concrete is placed through a funnel hopper at the top of the pier, the concrete mix shall be designed and proportioned so as to produce a cohesive workable mix having a slump of not less than 4 inches (102 mm) and not more than 6 inches (152 mm). Where concrete is to be pumped, the mix design including slump shall be adjusted to produce a pumpable concrete.~~

~~**1812.5 Concrete placement.** Concrete shall be placed in such a manner as to ensure the exclusion of any foreign matter and to secure a full-sized shaft. Concrete shall not be placed through water except where a tremie or other approved method is used. When depositing concrete from the top of the pier, the concrete shall not be chuted directly into the pier but shall be poured in a rapid and continuous operation through a funnel hopper centered at the top of the pier.~~

~~**1812.10 Dewatering.** Where piers are carried to depths below water level, the piers shall be constructed by a method that will provide accurate preparation and inspection of the bottom, and the depositing or construction of sound concrete or other masonry in the dry.~~

Committee Action:

Approved as Modified

Modify proposal as follows:

1808.6.3 Removal of expansive soil. Where expansive soil is removed in lieu of designing foundations in accordance with Section 1808.6.1 or 1808.6.2, the soil shall be removed to a depth sufficient to ensure a constant moisture content in the remaining soil. Fill material shall not contain expansive soils and shall comply with Section ~~1803.5 or 1803.6~~ 1804.5 or 1804.6.

Exception: Expansive soil need not be removed to the depth of constant moisture, provided the confining pressure in the expansive soil created by the fill and supported structure exceeds the swell pressure.

**TABLE 1808.8.1
MINIMUM SPECIFIED COMPRESSIVE STRENGTH, f'_c , OF CONCRETE OR GROUT**

FOUNDATION ELEMENT OR CONDITION	SPECIFIED COMPRESSIVE STRENGTH, f'_c
1. Foundations for structures assigned to Seismic Design Category A, B, or C	2,500 psi
2a. Foundations for Group R or U occupancies of light-framed construction, two stories or less in height, assigned to Seismic Design Category D, E, or F	2,500 psi
2b. Foundations for other structures assigned to Seismic Design Category D, E, or F	3,000 psi
3. Precast nonprestressed driven piles	3,000 4,000 psi
5. Socketed drilled shafts	4,000 psi
6. Micropiles	4,000 psi
7. Precast prestressed driven piles	5,000 psi

1808.8.2 Concrete cover. The concrete cover provided for prestressed and nonprestressed reinforcement in foundations shall be no less than ~~that the largest applicable value specified in Table 1808.8.2. Longitudinal bars spaced less than 1.5 inches (38 mm) clear distance apart shall be considered bundled bars for which the concrete cover provided shall also be no less than that required by Section 7.7.4 of ACI 318.~~ Concrete cover shall be measured from the concrete surface to the outermost surface of the steel to which the cover requirement applies. Where concrete is placed in a temporary or permanent casing or a mandrel, the inside face of the casing or mandrel shall be considered the concrete surface.

**TABLE 1808.8.2
MINIMUM CONCRETE COVER**

FOUNDATION ELEMENT OR CONDITION	MINIMUM COVER
1. Shallow foundations	In accordance with Section 7.7 of ACI 318
2. Precast nonprestressed deep foundation elements ^a Exposed to seawater Not manufactured under plant conditions Manufactured under plant control conditions	3 inches 2 inches In accordance with Section 7.7.3 of ACI 318
3. Precast prestressed deep foundation elements Exposed to seawater Other	2.5 inches In accordance with Section 7.7.3 of ACI 318
4. Cast-in-place deep foundation elements not enclosed by a steel pipe, tube, or permanent casing	2.5 inches
5. Cast-in-place deep foundation elements enclosed by a steel pipe, tube, or permanent casing	1 inch
6. Structural steel core within a steel pipe, tube, or permanent casing	2 inches
7. <u>Cast-in-place drilled shafts enclosed by a stable rock socket</u>	<u>1.5 inches</u>

a. ~~Longitudinal bars spaced less than 1.5 inches (38 mm) clear distance apart shall be considered bundled bars for which the minimum concrete cover shall be equal to that for the equivalent diameter of the bundled bars.~~

1808.8.3 Placement of concrete. Concrete shall be placed in such a manner as to ensure the exclusion of any foreign matter and to secure a full-sized foundation. Concrete shall not be placed through water unless a tremie or other method approved by the building official is used. Where placed under or in the presence of water, the concrete shall be deposited by approved means to ensure minimum segregation of the mix and negligible turbulence of the water. Where depositing concrete from the top of a deep foundation element, the concrete shall be chuted directly into smooth-sided pipes or tubes or ~~poured placed~~ in a rapid and continuous operation through a funnel hopper centered at the top of the element.

1809.2 Supporting soils. Shallow foundations shall be built on undisturbed soil, compacted fill material or controlled low-strength material (CLSM). Compacted fill material shall be placed in accordance with Section ~~1803.5~~ 1804.5. CLSM shall be placed in accordance with Section ~~1803.6~~ 1804.6.

1809.5 Frost protection. Except where otherwise protected from frost, foundations ~~walls~~ and other permanent supports of buildings and structures shall be protected from frost by one or more of the following methods:

1. Extending below the frost line of the locality;
2. Constructing in accordance with ASCE-32; or
3. Erecting on solid rock.

Exception: Free-standing buildings meeting all of the following conditions shall not be required to be protected:

1. Assigned to Occupancy Category I, in accordance with Section 1604.5;
2. Area of 600 square feet (56 m²) or less for light-frame construction or 400 square feet (37 m²) or less for other than light-frame construction; and
3. Eave height of 10 feet (3048 mm) or less.

Shallow foundations shall not bear on frozen soil unless such frozen condition is of a permanent character.

TABLE 1809.7
PRESCRIPTIVE FOOTINGS SUPPORTING WALLS OF LIGHT-FRAME CONSTRUCTION ^{a, b, c, d, e}

NUMBER OF FLOORS SUPPORTED BY THE FOOTING ^f	WIDTH OF FOOTING (inches)	THICKNESS OF FOOTING (inches)
1	12	6
2	15	6
3	18	8 ^g

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm.

- Depth of footings shall be in accordance with Section 1809.4.
- The ground under the floor shall be permitted to be excavated to the elevation of the top of the footing.
- Interior-stud-bearing walls shall be permitted to be supported by isolated footings. The footing width and length shall be twice the width shown in this table, and footings shall be spaced not more than 6 feet on center.
- See Section 1908 for additional requirements for concrete footings of structures assigned to Seismic Design Category C, D, E or F.
- For thickness of foundation walls, see Section ~~4805.5~~ 1807.1.6.
- Footings shall be permitted to support a roof in addition to the stipulated number of floors. Footings supporting roof only shall be as required for supporting one floor.
- Plain concrete footings for Group R-3 occupancies shall be permitted to be 6 inches thick.

1809.8 Plain concrete footings. The edge thickness of plain concrete footings supporting walls of other than light-frame construction shall not be less than 8 inches (203 mm) where placed on soil or rock.

Exception: For plain concrete footings supporting Group R-3 occupancies, the edge thickness is permitted to be 6 inches (152 mm), provided that the footing does not extend beyond a distance greater than the thickness of the footing on either side of the supported wall.

(Portions of proposal not shown remain unchanged)

Committee Reason: This reformatting of the foundation provisions makes the section easier to understand and apply. The modification makes editorial clarifications as well as section number correlations based on prior approved code changes. In addition, the minimum strength required for precast nonprecast driven piles (see Table 1808.8.1) is increased to avoid damage during installation. Also footnote a is removed from Table 1808.8.2 and the spacing requirement is added to Section 1808.8.2. Item 7 is added to Table 1808.8.2 to address piers in a rock socket cored in competent rock.

Assembly Action:

None

Final Hearing Results

S150-07/08

AM

Code Change No: S151-07/08

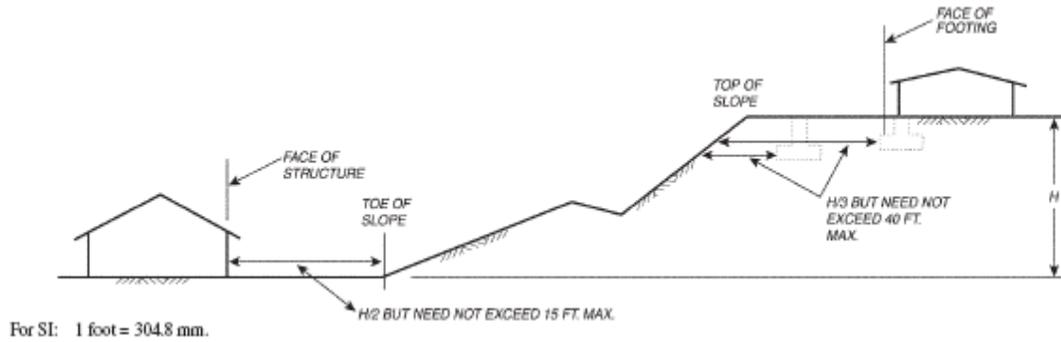
Original Proposal

Figure 1805.3.1

Proponent: Edwin T. Huston, Smith & Huston, Inc., representing the National Council of Structural Engineering Associations

Revise figure notation as follows:

AT LEAST THE SMALLER OF H/2 AND BUT NEED NOT EXCEED 15 FEET FT. MAX
AT LEAST THE SMALLER OF H/3 AND BUT NEED NOT EXCEED 40 FEET FT. MAX



**FIGURE 1805.3.1
FOUNDATION CLEARANCES FROM SLOPES**

Reason: Code clarification. Editorial.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: This proposal rewords the notes of Figure 1805.3.1 so that they will be clearer.

Assembly Action:

None

Final Hearing Results

S151-07/08

AS

Code Change No: S152-07/08

Original Proposal

Sections: 1805.4.2.1, 1805.5.2.1, 1805.7.3, 1805.9, 1808.2.23.2, 1809.2.2.1, 1809.2.2.3, 1809.2.2.4, 1809.2.3.1, 1809.2.3.3, 1809.2.3.4, 1810.1.1, 1810.2.2, 1810.3.1, 1810.4.1, 1810.5.2, 1810.5.2.3, 1810.6.2, 1810.7.2, 1812.3

Proponent: Philip Brazil, PE, SE, Reid Middleton, Inc., representing himself

Revise as follows:

1805.4.2.1 Concrete strength. Concrete in footings shall have a specified compressive strength (f'_c) of not less than 2,500 pounds per square inch (psi) (17 237 kPa) ~~at 28 days.~~

1805.5.2.1 Concrete foundation walls. Concrete foundation walls shall comply with the following:

1. The size and spacing of vertical reinforcement shown in Table 1805.5(5) is based on the use of reinforcement with a minimum yield strength of 60,000 psi (414 MPa). Vertical reinforcement with a minimum yield strength of 40,000 psi (276 MPa) or 50,000 psi (345 MPa) is permitted, provided the same size bar is used and the spacing shown in the table is reduced by multiplying the spacing by 0.67 or 0.83, respectively.
2. Vertical reinforcement, when required, shall be placed nearest the inside face of the wall a distance, d , from the outside face (soil side) of the wall. The distance, d , is equal to the wall thickness, t , minus 1.25 inches (32 mm) plus one-half the bar diameter, d_b [$d = t - (1.25 + d_b/2)$]. The reinforcement shall be placed within a tolerance of $\pm 3/8$ inch (9.5 mm) where d is less than or equal to 8 inches (203 mm) or $\pm 1/2$ inch (12.7 mm) where d is greater than 8 inches (203 mm).

3. In lieu of the reinforcement shown in Table 1805.5(5), smaller reinforcing bar sizes with closer spacings that provide an equivalent cross-sectional area of reinforcement per unit length of wall are permitted.
4. Concrete cover for reinforcement measured from the inside face of the wall shall not be less than 3/4 inch (19.1 mm). Concrete cover for reinforcement measured from the outside face of the wall shall not be less than 1.5 inches (38 mm) for No. 5 bars and smaller and not less than 2 inches (51 mm) for larger bars.
5. Concrete shall have a specified compressive strength, f'_c , of not less than 2,500 psi (17.2 MPa) ~~at 28 days~~.
6. The unfactored axial load per linear foot of wall shall not exceed $1.2 t f'_c$, where t is the specified wall thickness in inches.

1805.7.3 Backfill. The backfill in the annular space around columns not embedded in poured footings shall be by one of the following methods:

1. Backfill shall be of concrete with ~~an ultimate-a specified compressive~~ strength of 2,000 psi (13.8 MPa) ~~at 28 days~~. The hole shall not be less than 4 inches (102 mm) larger than the diameter of the column at its bottom or 4 inches (102 mm) larger than the diagonal dimension of a square or rectangular column.
2. Backfill shall be of clean sand. The sand shall be thoroughly compacted by tamping in layers not more than 8 inches (203 mm) in depth.
3. Backfill shall be of controlled low-strength material (CLSM).

1805.9 (Supp) Seismic requirements. See Section 1908 for additional requirements for footings and foundations of structures assigned to Seismic Design Category C, D, E or F.

For structures assigned to Seismic Design Category D, E or F, provisions of ACI 318, Sections 21.10.1 to 21.10.3, shall apply when not in conflict with the provisions of Section 1805. Concrete shall have a specified compressive strength of not less than 3,000 psi (20.68 MPa) ~~at 28 days~~.

Exceptions:

1. Group R or U occupancies of light-framed construction and two stories or less above grade plane are permitted to use concrete with a specified compressive strength of not less than 2,500 psi (17.2 MPa) ~~at 28 days~~.
2. Detached one- and two-family dwellings of light-frame construction and two stories or less above grade plane are not required to comply with the provisions of ACI 318, Sections 21.10.1 to 21.10.3.

1808.2.23.2 (Supp) Seismic Design Category D, E or F. Where a structure is assigned to Seismic Design Category D, E or F in accordance with Section 1613, the requirements for Seismic Design Category C given in Section 1808.2.23.1 shall be met, in addition to the following. Provisions of ACI 318, Section 21.10.4, shall apply when not in conflict with the provisions of Sections 1808 through 1812. Concrete shall have a specified compressive strength of not less than 3,000 psi (20.68 MPa) ~~at 28 days~~.

Exceptions:

1. Group R or U occupancies of light-frame construction and two stories or less above grade plane are permitted to use concrete with a specified compressive strength of not less than 2,500 psi (17.2 MPa) ~~at 28 days~~.
2. Detached one- and two-family dwellings of light-frame construction and two stories or less in height are not required to comply with the provisions of ACI 318, Section 21.10.4.
3. Section 21.10.4.4(a) of ACI 318 need not apply to concrete piles.

1809.2.2.1 Materials. Concrete shall have a ~~28-day~~ specified compressive strength (f'_c) of not less than 3,000 psi (20.68 MPa).

1809.2.2.3 Allowable stresses. The allowable compressive stress in the concrete shall not exceed 33 percent of the ~~28-day~~ specified compressive strength (f'_c) applied to the gross cross-sectional area of the pile. The allowable compressive stress in the reinforcing steel shall not exceed 40 percent of the yield strength of the steel (f_y) or a maximum of 30,000 psi (207 MPa). The allowable tensile stress in the reinforcing steel shall not exceed 50 percent of the yield strength of the steel (f_y) or a maximum of 24,000 psi (165 MPa).

1809.2.2.4 Installation. A precast concrete pile shall not be driven before the concrete has attained a compressive strength of at least 75 percent of the ~~28-day~~ specified compressive strength (f'_c), but not less than the strength sufficient to withstand handling and driving forces.

1809.2.3.1 Materials. Prestressing steel shall conform to ASTM A 416. Concrete shall have a ~~28-day~~ specified compressive strength (f'_c) of not less than 5,000 psi (34.48 MPa).

1809.2.3.3 (Supp) Allowable stresses. The allowable compressive stress, f_c , in concrete shall be determined as follows:

$$f_c = 0.33 f'_c - 0.27 f_{pc} \quad \text{(Equation 18-10)}$$

where:

f'_c = The ~~28-day~~ specified compressive strength of the concrete.

f_{pc} = The effective prestress stress on the gross section.

1809.2.3.4 Installation. A prestressed pile shall not be driven before the concrete has attained a compressive strength of at least 75 percent of the ~~28-day~~ specified compressive strength (f'_c), but not less than the strength sufficient to withstand handling and driving forces.

1810.1.1 Materials. Concrete shall have a ~~28-day~~ specified compressive strength (f'_c) of not less than 2,500 psi (17.24 MPa). Where concrete is placed through a funnel hopper at the top of the pile, the concrete mix shall be designed and proportioned so as to produce a cohesive workable mix having a slump of not less than 4 inches (102 mm) and not more than 6 inches (152 mm). Where concrete is to be pumped, the mix design including slump shall be adjusted to produce a pumpable concrete.

1810.2.2 Allowable stresses. The maximum allowable design compressive stress for concrete not placed in a permanent steel casing shall be 25 percent of the ~~28-day~~ specified compressive strength (f'_c). Where the concrete is placed in a permanent steel casing, the maximum allowable concrete stress shall be 33 percent of the ~~28-day~~ specified compressive strength (f'_c).

1810.3.1 Allowable stresses. The allowable design stress in the concrete of drilled or augered uncased piles shall not exceed 33 percent of the ~~28-day~~ specified compressive strength (f'_c). The allowable compressive stress of reinforcement shall not exceed 40 percent of the yield strength of the steel or 25,500 psi (175.8 MPa).

1810.4.1 Allowable stresses. The allowable design stress in the concrete shall not exceed 25 percent of the ~~28-day~~ specified compressive strength (f'_c) applied to a cross-sectional area not greater than the inside area of the drive casing or mandrel.

1810.5.2 Allowable stresses. The allowable design compressive stress in the concrete shall not exceed 33 percent of the ~~28-day~~ specified compressive strength (f'_c). The allowable concrete compressive stress shall be 0.40 (f'_c) for that portion of the pile meeting the conditions specified in Sections 1810.5.2.1 through 1810.5.2.4.

1810.5.2.3 Strength. The ratio of steel yield strength (f_y) to ~~28-day~~ specified compressive strength (f'_c) shall not be less than six.

1810.6.2 Allowable stresses. The allowable design compressive stress in the concrete shall not exceed 33 percent of the ~~28-day~~ specified compressive strength (f'_c). The allowable design compressive stress in the steel shall not exceed 35 percent of the minimum specified yield strength of the steel (F_y), provided F_y shall not be assumed greater than 36,000 psi (248 MPa) for computational purposes.

Exception: Where justified in accordance with Section 1808.2.10, the allowable stresses are permitted to be increased to 0.50 F_y .

1810.7.2 Materials. Pipe and steel cores shall conform to the material requirements in Section 1809.3. Pipes shall have a minimum wall thickness of 3/8 inch (9.5 mm) and shall be fitted with a suitable steel-driving shoe welded to the bottom of the pipe. Concrete shall have a ~~28-day~~ specified compressive strength (f'_c) of not less than 4,000 psi (27.58 MPa). The concrete mix shall be designed and proportioned so as to produce a cohesive workable mix with a slump of 4 inches to 6 inches (102 mm to 152 mm).

1812.3 Materials. Concrete shall have a ~~28-day~~ specified compressive strength (f'_c) of not less than 2,500 psi (17.24 MPa). Where concrete is placed through a funnel hopper at the top of the pier, the concrete mix shall be designed and proportioned so as to produce a cohesive workable mix having a slump of not less than 4 inches (102 mm) and not more than 6 inches (152 mm). Where concrete is to be pumped, the mix design including slump shall be adjusted to produce a pumpable concrete.

Reason: The change is proposed for consistency with the provisions of ACI 318-05, which establishes the technical provisions for the determination of specified compressive strength, including the time periods for strength tests of concrete samples. For example, Section 5.1.3 requires the specified compressive strength to be based on 28-day tests unless otherwise specified. Other test ages shall be specified in the design drawings or specifications. Section 5.6.2.4 requires a strength test to be the average of the strengths of two cylinder tests made from the same sample of concrete and tested at 28 days or at a test age designated for determination of the specified compressive strength. Requirements for setting the test age are already contained in ACI 318-05. Also specifying the test age in Chapter 18 of the IBC is redundant with respect to the commonly used test age of 28 days and in conflict with ACI 318 when a test age other than 28 days is preferred.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Modified

Modify proposal as follows:

1805.7.3 Backfill. The backfill in the annular space around columns not embedded in poured footings shall be by one of the following methods:

1. Backfill shall be of concrete with a specified compressive strength of not less than 2,000 psi (13.8 MPa). The hole shall not be less than 4 inches (102 mm) larger than the diameter of the column at its bottom or 4 inches (102 mm) larger than the diagonal dimension of a square or rectangular column.
2. Backfill shall be of clean sand. The sand shall be thoroughly compacted by tamping in layers not more than 8 inches (203 mm) in depth.
3. Backfill shall be of controlled low-strength material (CLSM).

(Portions of proposal not shown remain unchanged)

Committee Reason: This code change makes the IBC references to concrete compressive strength consistent with ACI 318 terminology. The modification makes an editorial change that helps to clarify the intent of Section 1805.7.3.

Assembly Action:

None

Final Hearing Results

S152-07/08

AM

Code Change No: S153-07/08

Original Proposal

Sections: 1805.4.2.2, 1808.2.23.1

Proponent: Edwin T. Huston, Smith & Huston, Inc., National Council of Structural Engineering Associations

Revise as follows:

1805.4.2.2 Footing seismic ties. Where a structure is assigned to Seismic Design Category D, E or F in accordance with Section 1613, individual spread footings founded on soil defined in Section 1613.5.2 as Site Class E or F shall be interconnected by ties. Unless it is demonstrated that equivalent restraint is provided by reinforced concrete beams within slabs on grade or reinforced concrete slabs on grade, Ties shall be capable of carrying, in tension or compression, a force equal to the lesser of the product of the larger footing design gravity load times the seismic coefficient, S_{DS} , divided by 10, and 25 percent of the smaller footing design gravity load, ~~unless it is demonstrated that equivalent restraint is provided by reinforced concrete beams within slabs on grade or reinforced concrete slabs on grade.~~

1808.2.23.1 (Supp) Seismic Design Category C. Where a structure is assigned to Seismic Design Category C in accordance with Section 1613, the following shall apply. Individual pile caps, piers or piles shall be interconnected by ties. Unless it can be demonstrated that equivalent restraint is provided by reinforced concrete beams within slabs on grade or reinforced concrete slabs on grade or confinement by competent rock, hard cohesive soils or very dense granular soils, Ties shall be capable of carrying, in tension ~~and~~ or compression, a force equal to the lesser of the

product of the larger pile cap or column design gravity load times the seismic coefficient, S_{DS} , divided by 10, and 25 percent of the smaller pile cap or column design gravity load unless it can be demonstrated that equivalent restraint is provided by reinforced concrete beams within slabs on grade or reinforced concrete slabs on grade or confinement by competent rock, hard cohesive soils or very dense granular soils.

Exception: In Groups R-3 and U occupancies of light-frame construction, pier foundations supporting foundation walls, isolated interior posts detailed so the pier is not subject to lateral loads, or exterior decks and patios, are not subject to interconnection if it can be shown the soils are of adequate stiffness, subject to the approval of the building official.

Reason: Code coordination, clarification, and relaxation of an overly restrictive code requirement. Changes “and” to “or” in Section 1808.2.23.1 for consistency with Section 1805.4.2.2 and with ASCE 7-05 Sections 12.13.5.2 and 12.13.6.2.

Clarifies the footing loads that are used to determine the tie force.

Where very large, heavily load foundations are adjacent to very small, lightly loads foundations basing the tie force on the larger foundation load can result in tie forces that are larger than the vertical loads being resisted by the smaller foundation. The added limit is to address this case.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: This code change makes editorial improvements and fixes an overly restrictive requirement for foundation ties.

Assembly Action:

None

Final Hearing Results

S153-07/08

AS

Code Change No: S154-07/08

Original Proposal

Sections: 1805.4.6, 1807.2, 2304.9.5.2, Chapter 35; IRC R401.1, Chapter 43

Proponent: David P. Tyree, PE, CBO and Dennis Pitts, American Forest & Paper Association

THESE PROPOSALS ARE ON THE AGENDA OF THE IBC STRUCTURAL AND THE IRC BUILDING/ENERGY CODE DEVELOPMENT COMMITTEES AS 2 SEPARATE CODE CHANGES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I—IBC STRUCTURAL

1. Revise as follows:

1805.4.6 Wood foundations. Wood foundation systems shall be designed and installed in accordance with AF&PA ~~Technical Report No. 7~~ PWF. Lumber and plywood shall be treated in accordance with AWPA U1 (Commodity Specification A, Use Category 4B and Section 5.2) and shall be identified in accordance with Section 2303.1.8.1.

1807.2 Dampproofing required. Where hydrostatic pressure will not occur as determined by Section 1802.2.3, floors and walls for other than wood foundation systems shall be dampproofed in accordance with this section. Wood foundation systems shall be constructed in accordance with AF&PA ~~Technical Report No. 7~~ PWF.

2304.9.5.2 (Supp) Fastenings for wood foundations. Fastenings for wood foundations shall be as required in AF&PA ~~Technical Report No. 7~~ PWF.

2. Revise Chapter 35 standards as follows:

American Forest & Paper Association

~~T.R. No. 7—87 Technical Report—Basic Requirements for Permanent Wood Foundation System~~
ANSI/AF&PA PWF-2007 Permanent Wood Foundation Design Specification.

PART II—IRC BUILDING/ENERGY

1. Revise as follows:

R401.1 Application. The provisions of this chapter shall control the design and construction of the foundation and foundation spaces for all buildings. In addition to the provisions of this chapter, the design and construction of foundations in areas prone to flooding as established by Table R301.2(1) shall meet the provisions of Section R324. Wood foundations shall be designed and installed in accordance with AF&PA ~~Report No. 7 PWF.~~

Exception: The provisions of this chapter shall be permitted to be used for wood foundations only in the following situations:

1. In buildings that have no more than two floors and a roof.
2. When interior basement and foundation walls are constructed at intervals not exceeding 50 feet (15 240 mm).

Wood foundations in Seismic Design Category D₀, D₁ or D₂ shall be designed in accordance with accepted engineering practice.

2. Revise standards in Chapter 43 as follows:

American Forest & Paper Association

~~T.R. No. 7—87 Basic Requirements for Permanent Wood Foundation System~~
ANSI/AF&PA PWF-2007 Permanent Wood Foundation Design Specification.

Reason: (IBC) This is an update to an existing AF&PA technical report which has been revised now to be a standard. The new standard is approved as an AF&PA standard and will further be approved as an ANSI consensus standard by August 2007. AF&PA's new standard for the design of Permanent Wood Foundations (PWF) entitled *PWF Design Specification (AF&PA PWF-2007)* was developed and balloted through AF&PA's Wood Design Standards Committee (WDSC), an ANSI-approved standards development group. The new PWF Design Specification was written as part of an effort to update design recommendations and procedures in the wood industry's documents design aides, such as *Technical Report 7: The Permanent Wood Foundation System* (1987) and the *The Permanent Wood Foundation System: Design, Fabrication and Installation Manual* (1987). Development of the new standard provides updated information and references to the latest wood design standards (NDS & SDPWS), the latest load standard (ASCE 7), and provides a consensus-based standard that can be referenced in the building code, replacing reference to *Technical Report 7*.

(IRC) The Permanent Wood Foundation Design Specification was developed as a consensus standard to replace reference to an AF&PA technical report that has been referenced in the codes for at least 20 years. The new specification refers the designer to current versions of the ASCE 7 standard for loading and to AF&PA's *National Design Specification for Wood Construction* and *Special Design Provisions for Wind and Seismic* for resistance. It also includes special requirements for below-ground design of treated wood structures. Copies of the Specification will be submitted separately.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Note: The following analysis was not in the Code Change Proposal book but was posted on the ICC website.

Analysis: Review of proposed new standard AF & PA PWF-07 indicated that, in the opinion of ICC Staff, the standard did comply with ICC standards criteria.

PART I – IBC STRUCTURAL

Committee Action:

Approved as Submitted

Committee Reason: This code change improves the code by adopting the latest version of the wood foundation standard by reference.

Assembly Action:

None

PART II – IRC B/E
Committee Action:

Approved as Submitted

Committee Reason: This change updates the referenced technical Report to a consensus standard and is needed in the code.

Assembly Action:

None

Final Hearing Results

S154-07/08, Part I	AS
S154-07/08, Part II	AS

Code Change No: S155-07/08

Original Proposal

Sections: 202, 714.3, 1805.9, 1808.2.23.2, 2209.1, 2210, 2302.1; IRC R202, R403.1.4.1, R702.3.3, R702.3.6

Proponent: Philip Brazil, PE, SE, Reid Middleton, Inc., representing himself

THESE PROPOSALS ARE ON THE AGENDA OF THE IBC STRUCTURAL AND THE IRC BUILDING/ENERGY CODE DEVELOPMENT COMMITTEES AS 2 SEPARATE CODE CHANGES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IBC STRUCTURAL

Revise as follows:

SECTION 202
DEFINITIONS

LIGHT-FRAME CONSTRUCTION. A type of construction whose vertical and horizontal structural elements are primarily formed by a system of repetitive wood or ~~light-gage~~ cold-formed steel framing members.

714.3 (Supp) Membrane protection. King studs and boundary elements that are integral elements in load-bearing walls of ~~light-framed~~ light-frame construction shall be permitted to have required fire-resistance ratings provided by the membrane protection provided for the load-bearing wall.

1805.9 (Supp) Seismic requirements. See Section 1908 for additional requirements for footings and foundations of structures assigned to Seismic Design Category C, D, E or F.

For structures assigned to Seismic Design Category D, E or F, provisions of ACI 318, Sections 21.10.1 to 21.10.3, shall apply when not in conflict with the provisions of Section 1805. Concrete shall have a specified compressive strength of not less than 3,000 psi (20.68 MPa) at 28 days.

Exceptions:

1. Group R or U occupancies of ~~light-framed~~ light-frame construction and two stories or less above grade plane are permitted to use concrete with a specified compressive strength of not less than 2,500 psi (17.2 MPa) at 28 days.
2. Detached one- and two-family dwellings of light-frame construction and two stories or less above grade plane are not required to comply with the provisions of ACI 318, Sections 21.10.1 to 21.10.3.

1808.2.23.2 (Supp) Seismic Design Category D, E or F. Where a structure is assigned to Seismic Design Category D, E or F in accordance with Section 1613, the requirements for Seismic Design Category C given in Section 1808.2.23.1 shall be met, in addition to the following. Provisions of ACI 318, Section 21.10.4, shall apply when not in conflict with the provisions of Sections 1808 through 1812. Concrete shall have a specified compressive strength of not less than 3,000 psi (20.68 MPa) at 28 days.

Exceptions:

1. Group R or U occupancies of ~~light-frame~~ light-frame construction and two stories or less above grade plane are permitted to use concrete with a specified compressive strength of not less than 2,500 psi (17.2 MPa) at 28 days.
2. Detached one- and two-family dwellings of light-frame construction and two stories or less in height are not required to comply with the provisions of ACI 318, Section 21.10.4.
3. Section 21.10.4.4(a) of ACI 318 need not apply to concrete piles.

2209.1 General. The design of cold-formed carbon and low-alloy steel structural members shall be in accordance with AISI-NAS. The design of cold-formed stainless-steel structural members shall be in accordance with ASCE 8. Cold-formed steel ~~light-framed~~ light-frame construction shall comply with Section 2210.

SECTION 2210 COLD-FORMED STEEL ~~LIGHT-FRAMED~~ LIGHT-FRAME CONSTRUCTION

2302.1 Definitions. The following words and terms shall, for the purposes of this chapter, have the meanings shown herein.

CONVENTIONAL LIGHT-FRAME ~~WOOD~~ CONSTRUCTION. A type of construction whose primary structural elements are formed by a system of repetitive wood-framing members. See Section 2308 for conventional light-frame ~~wood~~ construction provisions.

PART II – IRC BUILDING/ENERGY

Revise as follows:

SECTION R202 DEFINITIONS

~~LIGHT-FRAMED~~ LIGHT-FRAME CONSTRUCTION. A type of construction whose vertical and horizontal structural elements are primarily formed by a system of repetitive wood or ~~light-gage~~ cold-formed steel framing members.

R403.1.4.1 Frost protection. Except where otherwise protected from frost, foundation walls, piers and other permanent supports of buildings and structures shall be protected from frost by one or more of the following methods:

1. Extended below the frost line specified in Table R301.2.(1);
2. Constructing in accordance with Section R403.3;
3. Constructing in accordance with ASCE 32; or
4. Erected on solid rock.

Exceptions:

1. Protection of freestanding accessory structures with an area of 600 square feet (56 m²) or less, of ~~light-framed~~ light-frame construction, with an eave height of 10 feet (3048 mm) or less shall not be required.
2. Protection of freestanding accessory structures with an area of 400 square feet (37m²) or less, of other than ~~light-framed~~ light-frame construction, with an eave height of 10 feet (3048 mm) or less shall not be required.
3. Decks not supported by a dwelling need not be provided with footings that extend below the frost line. Footings shall not bear on frozen soil unless the frozen condition is permanent.

R702.3.3 Steel framing. Steel framing supporting gypsum board shall not be less than 1.25 inches (32 mm) wide in the least dimension. ~~Light-gage~~ nonload-bearing cold-formed steel framing shall comply with ASTM C 645. Load-bearing steel framing and steel framing from 0.033 inch to 0.112 inch (1 mm to 3 mm) thick shall comply with ASTM C 955.

R702.3.6 Fastening. Screws for attaching gypsum board to wood framing shall be Type W or Type S in accordance with ASTM C 1002 and shall penetrate the wood not less than ⁵/₈ inch (16 mm). Screws for attaching gypsum board to ~~light-gage~~ cold-formed steel framing shall be Type S in accordance with ASTM C 1002 and shall penetrate the steel not less than ³/₈ inch (10 mm). Screws for attaching gypsum board to steel framing 0.033 inch to 0.112 inch (1mm to 3 mm) thick shall comply with ASTM C 954.

Reason: The purpose for the proposal is to harmonize the IBC, the IRC and the reference standards of both codes with respect to light-frame construction, cold-formed steel framing members and conventional light-frame construction. In IBC Section 2302.1, “conventional light-frame wood construction” is changed to “conventional light-frame construction” for consistency with IBC Section 2308 on conventional light-frame construction where the latter term is used consistently throughout the section. A thorough search of the IBC and IRC was performed during preparation of this proposal and the proposed revisions represent the only revisions necessary to complete the process of harmonization. Note that Section 11.2 of ASCE 7-05 defines “light-frame construction.”

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

PART I – IBC STRUCTURAL

Committee Action:

Approved as Submitted

Committee Reason: This proposal creates consistency in terminology referring to light-frame construction throughout the code. It also harmonizes the IBC with the IRC.

Assembly Action:

None

PART II – IRC B/E

Committee Action:

Approved as Submitted

Committee Reason: This change updates the terminology of light-gage to cold-formed to agree with current standards. Also, harmonizes the IRC with the IBC with respect to light-frame construction.

Assembly Action:

None

Final Hearing Results

S155-07/08, Part I	AS
S155-07/08, Part II	AS

Code Change No: S156-07/08

Original Proposal

Section: 1806.1

Proponent: William Sherman, CH2M HILL, representing himself.

Revise as follows:

1806.1 General. Retaining walls shall be designed to ensure stability against overturning, sliding, excessive foundation pressure and water uplift. Retaining walls shall be designed for a safety factor of 1.5 against lateral sliding and overturning excluding load combinations that include seismic forces. The dead load factor used in load combinations under Section 1605.3 shall be taken as 1.0 when used with the safety factors defined in this section. The safety factor against lateral sliding shall be taken as the available soil resistance at the base of the structure's foundation divided by the net lateral force applied to the structure.

Reason: This proposal provides clarification and modification of existing code provisions.

An existing code clarification related to IBC 2000 states that the safety factor of 1.5 does not apply to load combinations that include seismic, but the published code remains unclear in this respect. Wording is added to clarify.

It is not practical to apply a reduction factor to dead loads, e.g. 0.6D, when an overall safety factor of 1.5 is also applied to stability requirements. Impractical and costly structures may result without the proposed revision.

The code does not define how the sliding safety factor is to be determined. Different safety factors can be obtained where passive pressures are included for retaining wall stability (depending upon whether the passive pressure force is included in the numerator or denominator). The proposed wording is based on recommended safety factor requirements in EM 1110-2-2502.

References:

EM 1110-2-2502, Retaining and Flood Walls, by the US Army Corps of Engineers (USACE).

Cost Impact: This code change proposal will reduce the cost of construction.

Public Hearing Results

Committee Action:

Approved as Modified

Modify proposal as follows:

1806.1 General. Retaining walls shall be designed to ensure stability against overturning, sliding, excessive foundation pressure and water uplift. Retaining walls shall be designed for a safety factor of 1.5 against lateral sliding and overturning ~~excluding load combinations that include seismic forces. The dead load factor used in load combinations under Section 1605.3 shall be taken as 1.0 when used with the safety factors defined in this section.~~ The safety factor against lateral sliding shall be taken as the available soil resistance at the base of the ~~structure's~~ retaining wall foundation divided by the net lateral force applied to the ~~structure~~ retaining wall.

Exception: Where earthquake loads are included, the minimum safety factor for retaining wall sliding and overturning shall be 1.1.

Committee Reason: This code change clarifies the required factor of safety against overturning and sliding under earthquake loading. The modification makes the factor of safety under earthquake loading 1.1 and moves the requirement to an exception.

Assembly Action:

None

Final Hearing Results

S156-07/08

AM

Code Change No: **S157-07/08**

Original Proposal

Section: 1806.1

Proponent: William Sherman, CH2M HILL, representing himself.

Revise as follows:

1806.1 General. Retaining walls shall be designed to ensure stability against overturning, sliding, excessive foundation pressure and water uplift. Retaining walls shall be designed for a safety factor of 1.5 against lateral sliding and overturning. Where a keyway is extended below the wall base with the intent to engage passive pressure and enhance sliding stability, lateral soil pressures on both sides of the keyway shall be considered in the sliding analysis.

Reason: Add a new requirement to existing provisions for retaining wall analyses, to ensure that a complete free-body diagram is used in design. Many software programs and design procedures for retaining walls with keyways ignore any driving pressures acting on the keyway, which is unconservative and ignores basic free-body diagram concepts. This provision clarifies that such forces must be considered but allows the engineer to determine the appropriate procedure.

References:

EM 1110-2-2502, Retaining and Flood Walls, by the US Army Corps of Engineers (USACE).

Cost Impact: This code change proposal will increase the cost of construction due to more conservative retaining wall design requirements than are commonly used.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: This proposal provides information on keyways used in retaining walls that should help designers in their analysis.

Assembly Action:

None

Final Hearing Results

S157-07/08

AS

Code Change No: **S158-07/08**

Original Proposal

Sections: 1807, 1805

Proponent: Edwin T. Huston, Smith & Huston, Inc., representing the National Council of Structural Engineering Associations

Revise as follows:

**SECTION ~~1807~~ 1805
DAMPPOOFING AND WATERPROOFING**

~~1807.1~~ Where required. **1805.1 General.** Walls or portions thereof that retain earth and enclose interior spaces and floors below grade shall be waterproofed and dampproofed in accordance with this section, with the exception of those spaces containing groups other than residential and institutional where such omission is not detrimental to the building or occupancy.

Ventilation for crawl spaces shall comply with Section 1203.4.

~~1807.1.1~~ 1805.1.1 **Story above grade plane.** Where a basement is considered a story above grade plane and the finished ground level adjacent to the basement wall is below the basement floor elevation for 25 percent or more of the perimeter, the floor and walls shall be dampproofed in accordance with Section ~~4807.2~~ 1805.2 and a foundation drain shall be installed in accordance with Section ~~4807.4.2~~ 1805.4.2. The foundation drain shall be installed around the portion of the perimeter where the basement floor is below ground level. The provisions of Sections 1802.2.3, ~~1805.3~~ 1807.3 and ~~1805.4.1~~ 1807.4.1 shall not apply in this case.

~~1807.1.2~~ 1805.1.2 **Under-floor space.** The finished ground level of an under-floor space such as a crawl space shall not be located below the bottom of the footings. Where there is evidence that the ground-water table rises to within 6 inches (152 mm) of the ground level at the outside building perimeter, or that the surface water does not readily drain from the building site, the ground level of the under-floor space shall be as high as the outside finished ground level, unless an approved drainage system is provided. The provisions of Sections 1802.2.3, ~~4807.2~~, ~~1807.3~~ and ~~1807.4~~ 1805.2, 1805.3 and 1805.4 shall not apply in this case.

~~1807.1.2.1~~ 1805.1.2.1 **Flood hazard areas.** For buildings and structures in flood hazard areas as established in Section 1612.3, the finished ground level of an under-floor space such as a crawl space shall be equal to or higher than the outside finished ground level.

Exception: Under-floor spaces of Group R-3 buildings that meet the requirements of FEMA/FIA-TB-11.

~~1807.1.3~~ 1805.1.3 **Ground-water control.** Where the ground-water table is lowered and maintained at an elevation not less than 6 inches (152 mm) below the bottom of the lowest floor, the floor and walls shall be dampproofed in accordance with Section ~~4807.2~~ 1805.2. The design of the system to lower the ground-water table shall be based on accepted principles of engineering that shall consider, but not necessarily be limited to, permeability of the soil, rate at which water enters the drainage system, rated capacity of pumps, head against which pumps are to operate and the rated capacity of the disposal area of the system.

~~1807.2~~ 1805.2 **Dampproofing required.** Where hydrostatic pressure will not occur as determined by Section 1802.2.3, floors and walls for other than wood foundation systems shall be dampproofed in accordance with this section. Wood foundation systems shall be constructed in accordance with AF&PA Technical Report No. 7.

~~1807.2.1~~ 1805.2.1 **Floors.** Dampproofing materials for floors shall be installed between the floor and the base course required by Section ~~4807.4.1~~ 1805.4.1, except where a separate floor is provided above a concrete slab. Where installed beneath the slab, dampproofing shall consist of not less than 6-mil (0.006 inch; 0.152 mm) polyethylene with joints lapped not less than 6 inches (152 mm), or other approved methods or materials. Where permitted to be installed on top of the slab, dampproofing shall consist of mopped-on bitumen, not less than 4-mil (0.004 inch; 0.102 mm) polyethylene, or other approved methods or materials. Joints in the membrane shall be lapped and sealed in accordance with the manufacturer's installation instructions.

4807.2.2 1805.2.2 Walls. Dampproofing materials for walls shall be installed on the exterior surface of the wall, and shall extend from the top of the footing to above ground level.

Dampproofing shall consist of a bituminous material, 3 pounds per square yard (16 N/m²) of acrylic modified cement, 0.125 inch (3.2 mm) coat of surface-bonding mortar complying with ASTM C 887, any of the materials permitted for waterproofing by Section ~~4807.3.2~~ 1805.3.2 or other approved methods or materials.

4807.2.2.1 1805.2.2.1 Surface preparation of walls. Prior to application of dampproofing materials on concrete walls, holes and recesses resulting from the removal of form ties shall be sealed with a bituminous material or other approved methods or materials. Unit masonry walls shall be parged on the exterior surface belowground level with not less than 0.375 inch (9.5 mm) of portland cement mortar. The parging shall be covered at the footing.

Exception: Parging of unit masonry walls is not required where a material is approved for direct application to the masonry.

4807.3 1805.3 Waterproofing required. Where the ground-water investigation required by Section 1802.2.3 indicates that a hydrostatic pressure condition exists, and the design does not include a ground-water control system as described in Section ~~4807.4.3~~ 1805.1.3, walls and floors shall be waterproofed in accordance with this section.

4807.3.1 1805.3.1 Floors. Floors required to be waterproofed shall be of concrete and designed and constructed to withstand the hydrostatic pressures to which the floors will be subjected.

Waterproofing shall be accomplished by placing a membrane of rubberized asphalt, butyl rubber, fully adhered/fully bonded HDPE or polyolefin composite membrane or not less than 6-mil [0.006 inch (0.152 mm)] polyvinyl chloride with joints lapped not less than 6 inches (152 mm) or other approved materials under the slab. Joints in the membrane shall be lapped and sealed in accordance with the manufacturer's installation instructions.

4807.3.2 1805.3.2 Walls. Walls required to be waterproofed shall be of concrete or masonry and shall be designed and constructed to withstand the hydrostatic pressures and other lateral loads to which the walls will be subjected.

Waterproofing shall be applied from the bottom of the wall to not less than 12 inches (305 mm) above the maximum elevation of the ground-water table. The remainder of the wall shall be dampproofed in accordance with Section ~~4807.2.2~~ 1805.2.2. Waterproofing shall consist of two-ply hot-mopped felts, not less than 6-mil (0.006 inch; 0.152 mm) polyvinyl chloride, 40-mil (0.040 inch; 1.02 mm) polymer-modified asphalt, 6-mil (0.006 inch; 0.152 mm) polyethylene or other approved methods or materials capable of bridging nonstructural cracks. Joints in the membrane shall be lapped and sealed in accordance with the manufacturer's installation instructions.

4807.3.2.1 1805.3.2.1 Surface preparation of walls. Prior to the application of waterproofing materials on concrete or masonry walls, the walls shall be prepared in accordance with Section ~~4807.2.2.1~~ 1805.2.2.1.

4807.3.3 1805.3.3 Joints and penetrations. Joints in walls and floors, joints between the wall and floor and penetrations of the wall and floor shall be made water-tight utilizing approved methods and materials.

4807.4 1805.4 Subsoil drainage system. Where a hydrostatic pressure condition does not exist, dampproofing shall be provided and a base shall be installed under the floor and a drain installed around the foundation perimeter. A subsoil drainage system designed and constructed in accordance with Section ~~4807.4.3~~ 1805.1.3 shall be deemed adequate for lowering the ground-water table.

4807.4.1 1805.4.1 Floor base course. Floors of basements, except as provided for in Section ~~4807.4.4~~ 1805.1.1, shall be placed over a floor base course not less than 4 inches (102 mm) in thickness that consists of gravel or crushed stone containing not more than 10 percent of material that passes through a No. 4 (4.75 mm) sieve.

Exception: Where a site is located in well-drained gravel or sand/gravel mixture soils, a floor base course is not required.

4807.4.2 1805.4.2 Foundation drain. A drain shall be placed around the perimeter of a foundation that consists of gravel or crushed stone containing not more than 10-percent material that passes through a No. 4 (4.75 mm) sieve. The drain shall extend a minimum of 12 inches (305 mm) beyond the outside edge of the footing. The thickness shall be such that the bottom of the drain is not higher than the bottom of the base under the floor, and that the top of the drain is not less than 6 inches (152 mm) above the top of the footing. The top of the drain shall be covered with an approved filter membrane material. Where a drain tile or perforated pipe is used, the invert of the pipe or tile shall not be higher than the floor elevation. The top of joints or the top of perforations shall be protected with an approved filter membrane material. The pipe or tile shall be placed on not less than 2 inches (51 mm) of gravel or crushed stone complying with Section ~~4807.4.4~~ 1805.4.1, and shall be covered with not less than 6 inches (152 mm) of the same material.

~~1807.4.3~~ **1805.4.3 Drainage discharge.** The floor base and foundation perimeter drain shall discharge by gravity or mechanical means into an approved drainage system that complies with the *International Plumbing Code*.

Exception: Where a site is located in well-drained gravel or sand/gravel mixture soils, a dedicated drainage system is not required.

Reason: Relocates the section as part of an overall reorganization to consolidate structural design requirements that may later appear in reference standards. Makes minor editorial revisions of section titles (new Sections 1805.1, 1805.2, and 1805.3).

Bibliography:

Composite of Chapter 18 reorganization assuming all of proponent's proposals are approved.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Modified

Modify proposal as follows:

1805.1.1 Story above grade plane. Where a basement is considered a story above grade plane and the finished ground level adjacent to the basement wall is below the basement floor elevation for 25 percent or more of the perimeter, the floor and walls shall be dampproofed in accordance with Section 1805.2 and a foundation drain shall be installed in accordance with Section 1805.4.2. The foundation drain shall be installed around the portion of the perimeter where the basement floor is below ground level. The provisions of Sections ~~1802.2.3~~ 1803.5.4, 1805.3 and 1805.4.1 shall not apply in this case.

1805.1.2 Under-floor space. The finished ground level of an under-floor space such as a crawl space shall not be located below the bottom of the footings. Where there is evidence that the ground-water table rises to within 6 inches (152 mm) of the ground level at the outside building perimeter, or that the surface water does not readily drain from the building site, the ground level of the under-floor space shall be as high as the outside finished ground level, unless an approved drainage system is provided. The provisions of Sections ~~1802.2.3~~, 1803.5.4, 1805.2, 1805.3 and 1805.4 shall not apply in this case.

1805.2 Dampproofing. Where hydrostatic pressure will not occur as determined by Section ~~1802.2.3~~ 1803.5.4, floors and walls for other than wood foundation systems shall be dampproofed in accordance with this section. Wood foundation systems shall be constructed in accordance with AF&PA Technical Report No. 7.

1805.3 Waterproofing. Where the ground-water investigation required by Section ~~1802.2.3~~ 1803.5.4 indicates that a hydrostatic pressure condition exists, and the design does not include a ground-water control system as described in Section 1805.1.3, walls and floors shall be waterproofed in accordance with this section.

(Portions of proposal not shown remain unchanged)

Committee Reason: This proposal makes some editorial corrections in the section on dampproofing and waterproofing and is coordinated with the other proposals to reformat Chapter 18. The modification provides further section number correlations based on approval of code change S146-07/08.

Assembly Action:

None

Final Hearing Results

S158-07/08

AM

Code Change No: **S159-07/08**

Original Proposal

Sections: 1807.1.2.1; IRC R408.7

Proponent: Rebecca C. Quinn, RC Quinn Consulting, Inc., representing US Department of Homeland Security, Federal Emergency Management Agency

THESE PROPOSALS ARE ON THE AGENDA OF THE IBC STRUCTURAL AND THE IRC BUILDING/ENERGY CODE DEVELOPMENT COMMITTEES AS 2 SEPARATE CODE CHANGES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IBC STRUCTURAL

Revise as follows:

1807.1.2.1 Flood hazard areas. For buildings and structures in flood hazard areas as established in Section 1612.3, the finished ground level of an under-floor space such as a crawl space shall be equal to or higher than the outside finished ground level on at least one side.

Exception: Under-floor spaces of Group R-3 buildings that meet the requirements of FEMA/ FIA-TB-11.

PART II – IRC BUILDING/ENERGY

Revise as follows:

R408.7 Flood resistance. For buildings located in areas prone to flooding as established in Table R301.2(1):

1. Walls enclosing the under-floor space shall be provided with flood openings in accordance with Section R324.2.2.
2. The finished ground level of the under-floor space shall be equal to or higher than the outside finished ground level on at least one side.

Exception: Under-floor spaces that meet the requirements of FEMA/FIA TB 11-1.

Reason: (IBC) The purpose of this code change is to clarify the existing requirement which is overly restrictive in that it requires the entire finished ground level of under-flood spaces to be equal to or higher than the outside finished ground level. In flood hazard areas, if the floor of an enclosed area, including a crawlspace, is below the exterior grade on all sides, then the building is considered to have a basement (as defined in 1612.2). Note that an under-floor space may be partially below grade; as long as the interior finished ground level is at or above the exterior finished grade on at least one side, then a basement as defined in 1612.2 is not created. Section 1807.1.2 specifies that the interior ground level of under-floor spaces may be below-grade if an approved drainage system is provided. This code change clarifies that that arrangement is not allowed in flood hazard areas because a basement (as defined in 1612.2) would be created.

(IRC) The purpose of this code change is to clarify the existing requirement which is overly restrictive in that it requires the entire finished ground level of under-flood spaces to be equal to or higher than the outside finished ground level. In flood hazard areas, if the floor of an enclosed area, including a crawlspace, is below the exterior grade on all sides, then the building is considered to have a basement (see R324.2.1(3)). Note that an under-floor space may be partially below grade; as long as the interior finished ground level is at or above the exterior finished grade on at least one side, then a basement is not created. Section R408.6 requires the grade in under-floor spaces to be as high as the outside finished grade unless an approved drainage system is provided. This code change clarifies that that arrangement is not allowed in flood hazard areas because a basement (below-grade on all sides) would be created.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

PART I – IBC STRUCTURAL

Committee Action:

Approved as Submitted

Committee Reason: This change aligns an IBC requirement in flood hazard areas with the NFIP.

Assembly Action:

None

PART II – IRC B/E
Committee Action:

Approved as Submitted

Committee Reason: This change provides a much needed clarification and removes an overly restrictive requirement.

Assembly Action:

None

Final Hearing Results

S159-07/08, Part I	AS
S159-07/08, Part II	AS

Code Change No: **S160-07/08**

Original Proposal

Sections: 1808, 1809, 1810, 1811, 1812

Proponent: Edwin T. Huston, Smith & Huston, Inc., representing the National Council of Structural Engineering Associations

1. Revise as follows:

SECTION 1808 1802
PIER AND PILE DEFINITIONS

1808.1 1802.1 Definitions. The following words and terms shall, for the purposes of this section chapter, have the meanings shown herein.

DEEP FOUNDATION. A deep foundation is a foundation element that does not satisfy the definition of a shallow foundation.

DRILLED SHAFT. A drilled shaft is a cast-in-place deep foundation element constructed by drilling a hole (with or without permanent casing) into soil or rock and filling it with fluid concrete.

Socketed drilled shaft A socketed drilled shaft is a drilled shaft with a permanent pipe or tube casing that extends down to bedrock and an uncased socket drilled into the bedrock.

MICROPILES. ~~Micro piles are 12-inch (305 mm) diameter or less, A micropile is a bored, grouted-in-place piles incorporating steel pipe (casing) and/or steel reinforcement deep foundation element that develops its load-carrying capacity by means of a bond zone in soil, bedrock, or a combination of soil and bedrock.~~

SHALLOW FOUNDATION. A shallow foundation is an individual or strip footing, a mat foundation, a slab on grade foundation, or a similar foundation element.

FLEXURAL LENGTH. ~~Flexural length is the length of the pile from the first point of zero lateral deflection to the underside of the pile cap or grade beam.~~

PIER FOUNDATIONS. ~~Pier foundations consist of isolated masonry or cast-in-place concrete structural elements extending into firm materials. Piers are relatively short in comparison to their width, with lengths less than or equal to 12 times the least horizontal dimension of the pier. Piers derive their load-carrying capacity through skin friction, through end bearing, or a combination of both.~~

Belled piers. ~~Belled piers are cast-in-place concrete piers constructed with a base that is larger than the diameter of the remainder of the pier. The belled base is designed to increase the load-bearing area of the pier in end bearing.~~

PILE FOUNDATIONS. Pile foundations consist of concrete, wood or steel structural elements either driven into the ground or cast in place. Piles are relatively slender in comparison to their length, with lengths exceeding 12 times the least horizontal dimension. Piles derive their load-carrying capacity through skin friction, through end bearing, or a combination of both.

Augered uncased piles. Augered uncased piles are constructed by depositing concrete into an uncased augered hole, either during or after the withdrawal of the auger.

Caisson piles. Caisson piles are cast in place concrete piles extending into bedrock. The upper portion of a caisson pile consists of a cased pile that extends to the bedrock. The lower portion of the caisson pile consists of an uncased socket drilled into the bedrock.

Concrete-filled steel pipe and tube piles. Concrete-filled steel pipe and tube piles are constructed by driving a steel pipe or tube section into the soil and filling the pipe or tube section with concrete. The steel pipe or tube section is left in place during and after the deposition of the concrete.

Driven uncased piles. Driven uncased piles are constructed by driving a steel shell into the soil to shore an unexcavated hole that is later filled with concrete. The steel casing is lifted out of the hole during the deposition of the concrete.

Enlarged base piles. Enlarged base piles are cast in place concrete piles constructed with a base that is larger than the diameter of the remainder of the pile. The enlarged base is designed to increase the load-bearing area of the pile in end bearing.

Steel-cased piles. Steel cased piles are constructed by driving a steel shell into the soil to shore an unexcavated hole. The steel casing is left permanently in place and filled with concrete.

Timber piles. Timber piles are round, tapered timbers with small (tip) end embedded into the soil.

SECTION 1810 DEEP FOUNDATIONS

1808.2 Piers and piles—general requirements.

1808.2.1 Design. Piles are permitted to be designed in accordance with provisions for piers in Section 1808 and Sections 1812.3 through 1812.10 where either of the following conditions exists, subject to the approval of the building official:

1. Group R-3 and U occupancies not exceeding two stories of light-frame construction, or
2. Where the surrounding foundation materials furnish adequate lateral support for the pile.

1810.1 General. Deep foundations shall be analyzed, designed, detailed, and installed in accordance with Sections 1810.1 through 1810.4.

1808.2.2 1810.1.1 General Geotechnical Investigation. Pier and pile Deep foundations shall be designed and installed on the basis of a foundation investigation as defined in Section 1802, unless sufficient data upon which to base the design and installation is available. The investigation and report provisions of Section 1802 shall be expanded to include, but not be limited to, the following:

1. Recommended pier or pile types and installed capacities.
2. Recommended center-to-center spacing of piers or piles.
3. Driving criteria.
4. Installation procedures.
5. Field inspection and reporting procedures (to include procedures for verification of the installed bearing capacity where required).
6. Pier or pile load test requirements.
7. Durability of pier or pile materials.
8. Designation of bearing stratum or strata.
9. Reductions for group action, where necessary.

1808.2.18 1810.1.2 Use of existing piers or piles deep foundation elements. ~~Piers or piles~~ Deep foundation elements left in place where a structure has been demolished shall not be used for the support of new construction unless satisfactory evidence is submitted to the building official, which indicates that the ~~piers or piles elements~~ elements are sound and meet the requirements of this code. Such ~~piers or piles elements~~ elements shall be load tested or redriven to verify their capacities. The design load applied to such ~~piers or piles elements~~ elements shall be the lowest allowable load as determined by tests or redriving data.

1810.1.3 Deep foundation elements classified as columns. Deep foundation elements standing unbraced in air, water, or fluid soils shall be classified as columns and designed as such in accordance with the provisions of this code from their top down to the point where adequate lateral support is provided in accordance with Section 1810.2.1.

Exception: Where the unsupported height to least horizontal dimension of a cast-in-place deep foundation element does not exceed three, it shall be permitted to design and construct such an element as a pedestal in accordance with ACI 318.

1808.2.3 1810.1.4 Special types of piles deep foundations. The use of types of ~~piles~~ deep foundation elements not specifically mentioned herein is permitted, subject to the approval of the building official, upon the submission of acceptable test data, calculations and other information relating to the structural properties and load capacity of such ~~piles elements~~ elements. The allowable stresses for materials shall not in any case exceed the limitations specified herein.

1808.2.9 Lateral support.

1810.2 Analysis. The analysis of deep foundations for design shall be in accordance with Sections 1810.2.1 through 1810.2.5.

1808.2.9.1 1810.2.1 General Lateral support. Any soil other than fluid soil shall be deemed to afford sufficient lateral support ~~to the pier or pile to prevent buckling of deep foundation elements~~ and to permit the design of the ~~pier or pile elements~~ elements in accordance with accepted engineering practice and the applicable provisions of this code.

1808.2.9.2 Unbraced piles. ~~Piles standing~~ Where deep foundation elements stand unbraced in air, water, or in fluid soils, it shall be designed as columns in accordance with the provisions of this code. ~~Such piles driven into firm ground can be considered~~ permitted to consider them fixed and laterally supported at a point 5 feet (1524 mm) below the ground surface and in soft material at into stiff soil or 10 feet (3048 mm) below the ground surface into soft soil unless otherwise prescribed by the building official after a foundation investigation by an approved agency.

1808.2.5 1810.2.2 Stability. ~~Piers or piles~~ Deep foundation elements shall be braced to provide lateral stability in all directions. Three or more ~~piles elements~~ elements connected by a rigid cap shall be considered braced, provided that the ~~piles elements~~ elements are located in radial directions from the centroid of the group not less than 60 degrees (1 rad) apart. A ~~two-pile two-element~~ group in a rigid cap shall be considered to be braced along the axis connecting the two piles elements. Methods used to brace ~~piers or piles deep foundation elements~~ elements shall be subject to the approval of the building official.

~~Piles~~ Deep foundation elements supporting walls shall be ~~driven placed~~ alternately in lines spaced at least 1 foot (305 mm) apart and located symmetrically under the center of gravity of the wall load carried, unless effective measures are taken to provide for eccentricity and lateral forces, or the ~~wall-piles foundation elements~~ elements are adequately braced to provide for lateral stability. ~~A single row of piles without lateral bracing is permitted for one- and two-family dwellings and lightweight construction not exceeding two stories above grade plane or 35 feet (10 668 mm) in building height, provided the centers of the piles are located within the width of the foundation wall.~~

Exceptions:

1. Isolated cast-in-place deep foundation elements without lateral bracing shall be permitted where the least horizontal dimension is no less than 2 feet (610 mm), adequate lateral support in accordance with Section 1810.2.1 is provided for the entire height and the height does not exceed 12 times the least horizontal dimension.
2. A single row of deep foundation elements without lateral bracing is permitted for one- and two-family dwellings and lightweight construction not exceeding two stories above grade plane or 35 feet (10 668 mm) in building height, provided the centers of the elements are located within the width of the supported wall.

1808.2.12 1810.2.3 Settlement analysis. The settlement of ~~piers, individual piles or groups of piles~~ a single deep foundation element or group thereof shall be estimated based on approved methods of analysis. The predicted settlement shall cause neither harmful distortion of, nor instability in, the structure, nor cause any stresses to exceed allowable values.

~~1808.2.23.1.2~~ **1810.2.4 Design details Lateral loads.** Pier or pile ~~The~~ moments, shears and lateral deflections used for design of deep foundation elements shall be established considering the nonlinear interaction of the shaft and soil, as recommended determined by a registered design professional. Where the ratio of the depth of embedment of the pile to pile diameter or width element to its least horizontal dimension is less than or equal to six, ~~the pile may be assumed to be~~ it shall be permitted to assume the element is rigid.

~~Pile group effects from soil on lateral pile nominal strength shall be included where pile center-to-center spacing in the direction of lateral force is less than eight pile diameters. Pile group effects on vertical nominal strength shall be included where pile center-to-center spacing is less than three pile diameters. The pile uplift soil nominal strength shall be taken as the pile uplift strength as limited by the frictional force developed between the soil and the pile.~~

~~Where a minimum length for reinforcement or the extent of closely spaced confinement reinforcement is specified at the top of the pier or pile, provisions shall be made so that those specified lengths or extents are maintained after pier or pile cutoff.~~

1808.2.23.2.1 1810.2.4.1 Design details for piers, piles and grade beams Seismic Design Categories D through F. ~~Piers or piles~~ For structures assigned to Seismic Design Category D, E, or F, deep foundation elements on Site Class E or F sites, as determined in Section 1613.5.2, shall be designed and constructed to withstand maximum imposed curvatures from earthquake ground motions and structure response. Curvatures shall include free-field soil strains modified for soil-pile foundation-structure interaction coupled with pier or pile foundation element deformations induced by lateral pier or pile resistance to structure seismic forces associated with earthquake loads imparted to the foundation by the structure.

Exception: ~~Piers or piles~~ Deep foundation elements that satisfy the following additional detailing requirements shall be deemed to comply with the curvature capacity requirements of this section.

1. Precast prestressed concrete piles detailed in accordance with Section ~~1809.2.3.2.2~~ 1810.3.8.3.3.
2. Cast-in-place ~~concrete piles~~ deep foundation elements with a minimum longitudinal reinforcement ratio of 0.005 extending the full length of the pile element and detailed in accordance with Sections 21.4.4.1, 21.4.4.2 and 21.4.4.3 of ACI 318 as required by this Section ~~1810.3.9.4.2.2~~.

~~Where constructed of nonprestressed concrete such piers or piles shall be designed and detailed in accordance with Sections 21.4.4.1, 21.4.4.2 and 21.4.4.3 of ACI 318 within seven pile diameters of the pile cap and within seven pile diameters of the interfaces of strata that are hard or stiff and strata that are liquefiable or are composed of soft to medium stiff clay.~~

~~Grade beams shall comply with the provisions in Section 21.10.3 of ACI 318 for grade beams, except where they have the capacity to resist the forces from the load combinations in Section 1605.4.~~

1810.2.5 Group effects. The analysis shall include group effects on lateral behavior where the center-to-center spacing of deep foundation elements in the direction of lateral force is less than eight times the least horizontal dimension of an element. The analysis shall include group effects on axial behavior where the center-to-center spacing of deep foundation elements is less than three times the least horizontal dimension of an element.

1810.3 Design and Detailing. Deep foundations shall be designed and detailed in accordance with Sections 1810.3.1 through 1810.3.12.

1810.3.1 Design conditions. Design of deep foundations shall include the design conditions specified in Sections 1810.3.1.1 through 1810.3.1.5, as applicable.

1810.3.1.1 Design methods for concrete elements. Where concrete deep foundations are laterally supported in accordance with Section 1810.2.1 for the entire height and applied forces cause bending moments no greater than those resulting from accidental eccentricities, structural design of the element using the load combinations of Section 1605.3 and the allowable stresses specified in this chapter shall be permitted. Otherwise, the structural design of concrete deep foundation elements shall use the load combinations of Section 1605.2 and approved strength design methods.

1810.3.1.2 Composite elements. Where a single deep foundation element comprises two or more sections of different materials or different types spliced together, each section of the composite assembly shall satisfy the applicable requirements of this code, and the maximum allowable load shall be limited by the capacity of the weakest section.

~~1808.2.8.8~~ **1810.3.1.3 Overloads on piers or piles Mislocation.** The maximum compressive load on any pier or pile due to mislocation shall not exceed To resist the effects of mislocation, compressive overload of deep foundation elements to 110 percent of the allowable design load shall be permitted.

~~1809.2.1.4~~ **1810.3.1.4 Design and manufacture Driven piles.** Driven piles shall be designed and manufactured in accordance with accepted engineering practice to resist all stresses induced by handling, driving and service loads.

~~1810.5.4~~ **1810.3.1.5 Materials Casings.** Pile shells or Temporary and permanent casings shall be of steel and shall be sufficiently strong to resist collapse and sufficiently water tight to exclude any foreign materials during the placing of concrete. Steel shells shall have a sealed tip with a diameter of not less than 8 inches (203 mm). Where a permanent casing is considered reinforcing steel, the steel shall be protected under the conditions specified in Section 1810.3.2.5. Horizontal joints in the casing shall be spliced in accordance with Section 1810.3.6.

1810.3.2 Materials. The materials used in deep foundations elements shall satisfy the requirements of Sections 1810.3.2.1 through 1810.3.2.8, as applicable.

~~1810.2.4~~ **1810.3.2.1 Materials Concrete.** Where concrete is cast in a steel pipe or where an enlarged base is formed by compacting concrete, the maximum size for coarse aggregate for concrete shall be 3/4 inch (19.1 mm). Concrete to be compacted shall have a zero slump.

1810.3.2.1.1 Seismic hooks. For structures assigned to Seismic Design Category C, D, E, or F in accordance with Section 1613, the ends of hoops, spirals and ties used in concrete deep foundation elements shall be terminated with seismic hooks, as defined in Section 21.1 of ACI 318, and shall be turned into the confined concrete core.

1810.3.2.2 Prestressing steel. Prestressing steel shall conform to ASTM A 416.

~~1809.3.4~~ **1810.3.2.3 Materials Structural steel.** Structural steel piles, steel pipe and fully welded steel piles fabricated from plates shall conform to ASTM A 36, ASTM A 252, ASTM A 283, ASTM A 572, ASTM A 588, ASTM A 690, ASTM A 913 or ASTM A 992.

~~1809.4~~ **1810.3.2.4 Timber piles.** Timber piles deep foundation elements shall be designed as piles or poles in accordance with the AF&PA NDS.

~~1809.1.1~~ **Materials.** Round timber piles elements shall conform to ASTM D 25. Sawn timber piles elements shall conform to DOC PS-20.

~~1809.1.2~~ **1810.3.2.4.1 Preservative treatment.** Timber piles deep foundation elements used to support permanent structures shall be treated in accordance with this section unless it is established that the tops of the untreated timber piles elements will be below the lowest ground-water level assumed to exist during the life of the structure. Preservative and minimum final retention shall be in accordance with AWPA U1 (Commodity Specification E, Use Category 4C) for round timber piles elements and AWPA U1 (Commodity Specification A, Use Category 4B) for sawn timber piles elements. Preservative-treated timber piles elements shall be subject to a quality control program administered by an approved agency. Pile Element cutoffs shall be treated in accordance with AWPA M4.

~~1808.2.47~~ **1810.3.2.5 Protection of pile materials.** Where boring records or site conditions indicate possible deleterious action on pier or pile the materials used in deep foundation elements because of soil constituents, changing water levels or other factors, the pier or pile materials elements shall be adequately protected by materials, methods or processes approved by the building official. Protective materials shall be applied to the piles elements so as not to be rendered ineffective by driving installation. The effectiveness of such protective measures for the particular purpose shall have been thoroughly established by satisfactory service records or other evidence.

1810.3.2.6 Allowable stresses. The allowable stresses for materials used in deep foundation elements shall not exceed those specified in Table 1810.3.2.6.

TABLE 1810.3.2.6
ALLOWABLE STRESSES FOR MATERIALS USED IN DEEP FOUNDATION ELEMENTS

MATERIAL TYPE AND CONDITION	MAXIMUM ALLOWABLE STRESS^a
1. <u>Concrete or grout in compression^b</u> <u>Cast-in-place with a permanent casing in accordance with Section 1810.3.2.7</u> <u>Cast-in-place in a pipe, tube, or other permanent casing</u> <u>Cast-in-place without a permanent casing</u> <u>Precast nonprestressed</u> <u>Precast prestressed</u>	$0.4 f'_c$ $0.33 f'_c$ $0.3 f'_c$ $0.33 f'_c$ $0.33 f'_c - 0.27 f_{pc}$
2. <u>Nonprestressed reinforcement in compression</u>	$0.4 f_y \leq 30,000$ psi
3. <u>Structural steel in compression</u> <u>Cores within concrete-filled pipes or tubes</u> <u>Pipes, tubes, or H-piles, where justified in accordance with Section 1810.3.2.8</u> <u>Pipes or tubes for micropiles</u> <u>Other pipes, tubes, or H-piles</u>	$0.5 F_y \leq 32,000$ psi $0.5 F_y \leq 32,000$ psi $0.4 F_y \leq 32,000$ psi $0.35 F_y \leq 16,000$ psi
4. <u>Nonprestressed reinforcement in tension</u> <u>Within micropiles</u> <u>Other conditions</u>	$0.6 f_y$ $0.5 f_y \leq 24,000$ psi
5. <u>Structural steel in tension</u> <u>Pipes, tubes, or H-piles, where justified in accordance with Section 1810.3.2.8</u> <u>Other pipes, tubes, or H-piles</u>	$0.5 F_y \leq 32,000$ psi $0.35 F_y \leq 16,000$ psi
6. <u>Timber</u>	In accordance with the AF&PA NDS

- a. f'_c is the specified compressive strength of the concrete or grout; f_{pc} is the compressive stress on the gross concrete section due to effective prestress forces only; f_y is the specified yield strength of reinforcement; F_y is the specified minimum yield stress of structural steel.
- b. The stresses specified apply to the gross cross-sectional area within the concrete surface. Where a temporary or permanent casing is used, the inside face of the casing shall be considered the concrete surface.

1810.5.2 1810.3.2.7 Allowable stresses Increased allowable compressive stress for cased cast-in-place elements. The allowable design compressive stress in the concrete shall not exceed 33 percent of the 28-day specified compressive strength (f'_c). The allowable concrete compressive stress shall be $0.40 (f'_c)$ for that portion of the pile meeting the conditions specified in Sections 1810.5.2.1 through 1810.5.2.4. shall be permitted to be increased as specified in Table 1810.3.2.6 for those portions of permanently cased cast-in-place elements that satisfy the following conditions:

1. The design shall not use the casing to resist any portion of the axial load imposed.
2. The casing shall have a sealed tip and be mandrel driven.
3. **1810.5.2.1 Shell thickness.** The thickness of the steel shell casing shall not be less than manufacturer's standard gage No. 14 gage (0.068 inch) (1.75 mm) minimum.
4. **1810.5.2.2 Shell type.** The shell casing shall be seamless or provided with seams of strength equal to the basic material and be of a configuration that will provide confinement to the cast-in-place concrete.
5. **1810.5.2.3 Strength.** The ratio of steel yield strength (F_y) to 28-day specified compressive strength (f'_c) shall not be less than six.
6. **1810.5.2.4 Diameter.** The nominal pile diameter of the element shall not be greater than 16 inches (406 mm).

1808.2.10 1810.3.2.8 Use Justification of higher allowable pier or pile stresses. Use of allowable stresses greater than those specified for piers or for each pile type in Sections 1809 and 1810 are in Section 1810.3.2.6 shall be permitted where supporting data justifying such higher stresses is filed with the building official. Such substantiating data shall include:

1. A soils investigation in accordance with Section 1802.2; and
2. Pier or pile Load tests in accordance with Section 1808.2.8.3 1810.3.3.1.2, regardless of the load supported by the pier or pile element.

The design and installation of the ~~pier or pile~~ deep foundation elements shall be under the direct supervision of a registered design professional knowledgeable in the field of soil mechanics and ~~pier or pile~~ deep foundations who shall certify to the building official that the ~~piers or piles~~ elements as installed satisfy the design criteria.

~~1808.2.8.4~~ 1810.3.3 Determination of allowable loads. The allowable axial and lateral loads on ~~piers or piles~~ deep foundation elements shall be determined by an approved formula, load tests or method of analysis.

1810.3.3.1 Allowable axial load. The allowable axial load on a deep foundation element shall be determined in accordance with Section 1810.3.3.1.

~~1808.2.8.2~~ 1810.3.3.1.1 Driving criteria. The allowable compressive load on any ~~pile~~ driven deep foundation element where determined by the application of an approved driving formula shall not exceed 40 tons (356 kN). For allowable loads above 40 tons (356 kN), the wave equation method of analysis shall be used to estimate ~~pile~~ driveability ~~of~~ for both driving stresses and net displacement per blow at the ultimate load. Allowable loads shall be verified by load tests in accordance with Section ~~1808.2.8.3~~ 1810.3.3.1.2. The formula or wave equation load shall be determined for gravity-drop or power-actuated hammers and the hammer energy used shall be the maximum consistent with the size, strength and weight of the driven ~~piles~~ elements. The use of a follower is permitted only with the approval of the building official. The introduction of fresh hammer cushion or pile cushion material just prior to final penetration is not permitted.

~~1808.2.8.3~~ 1810.3.3.1.2 Load tests. Where design compressive loads ~~per pier or pile~~ are greater than those permitted by Section ~~1808.2.10~~ or determined using the allowable stresses specified in Section 1810.3.2.6 where the design load for any ~~pier or pile~~ deep foundation element is in doubt, or where ~~cast-in-place deep foundation elements have an enlarged base formed either by compacting concrete or by driving a precast base,~~ control test ~~piers or piles~~ elements shall be tested in accordance with ASTM D 1143 or ASTM D 4945. At least one ~~pier or pile~~ element shall be ~~test loaded~~ load tested in each area of uniform subsoil conditions. Where required by the building official, additional ~~piers or piles~~ elements shall be load tested where necessary to establish the safe design capacity. The resulting allowable loads shall not be more than one-half of the ultimate axial load capacity of the test ~~pier or pile~~ element as assessed by one of the published methods listed in Section ~~1808.2.8.3.4~~ 1810.3.3.1.3 with consideration for the test type, duration and subsoil. The ultimate axial load capacity shall be determined by a registered design professional with consideration given to tolerable total and differential settlements at design load in accordance with Section ~~1808.2.42~~ 1810.2.3. In subsequent installation of the balance of deep foundation piles elements, all ~~piles~~ elements shall be deemed to have a supporting capacity equal to that of the control ~~pile~~ element where such ~~piles~~ elements are of the same type, size and relative length as the test ~~pile~~ element; are installed using the same or comparable methods and equipment as the test ~~pile~~ element; are installed in similar subsoil conditions as the test ~~pile~~ element; and, for driven ~~piles~~ elements, where the rate of penetration (e.g., net displacement per blow) of such ~~piles~~ elements is equal to or less than that of the test ~~pile~~ element driven with the same hammer through a comparable driving distance.

~~1808.2.8.3.4~~ 1810.3.3.1.3 Load test evaluation methods. It shall be permitted to evaluate ~~pile~~ load tests ~~with~~ of deep foundation elements using any of the following methods:

1. Davisson Offset Limit.
2. Brinch-Hansen 90% Criterion.
3. Butler-Hoy Criterion.
4. Other methods approved by the building official.

~~1808.2.8.4~~ 1810.3.3.1.4 Allowable frictional resistance. The assumed frictional resistance developed by any ~~pier or uncased cast-in-place pile~~ deep foundation element shall not exceed one-sixth of the bearing value of the soil material at minimum depth as set forth in Table 1804.2, up to a maximum of 500 psf (24 kPa), unless a greater value is allowed by the building official ~~after~~ on the basis of a soil investigation as specified in Section 1802 is submitted or a greater value is substantiated by a load test in accordance with Section ~~1808.2.8.3~~ 1810.3.3.1.2. Frictional resistance and bearing resistance shall not be assumed to act simultaneously unless recommended by a soil investigation as specified in Section 1802.

~~1808.2.8.5~~ 1810.3.3.1.5 Uplift capacity of a single deep foundation element. Where required by the design, the uplift capacity of a single ~~pier or pile~~ deep foundation element shall be determined by an approved method of analysis based on a minimum factor of safety of three or by load tests conducted in accordance with ASTM D 3689. The maximum allowable uplift load shall not exceed the ultimate load capacity as determined in Section ~~1808.2.8.3~~ 1810.3.3.1.2 divided by a factor of safety of two.

1810.3.3.1.6 Uplift capacity of grouped deep foundation elements. For ~~pile groups~~ grouped deep foundation elements subjected to uplift, the allowable working uplift load for the group shall be the lesser of:

1. The proposed individual ~~pile~~ pile uplift working load times the number of ~~piles~~ elements in the group.
2. Two-thirds of the effective weight of the ~~pile~~ pile group and the soil contained within a block defined by the perimeter of the group and the length of the ~~pile~~ pile element.

~~4808.2.8.6~~ **1810.3.3.1.7 Load-bearing capacity.** ~~Piers, individual piles and groups of piles~~ Deep foundation elements shall develop ultimate load capacities of at least twice the design working loads in the designated load-bearing layers. Analysis shall show that no soil layer underlying the designated load-bearing layers causes the load-bearing capacity safety factor to be less than two.

~~4808.2.8.7~~ **1810.3.3.1.8 Bent piers or piles deep foundation elements.** The load-bearing capacity of ~~piers or piles~~ deep foundation elements discovered to have a sharp or sweeping bend shall be determined by an approved method of analysis or by load testing a representative ~~pier or pile~~ element.

~~4808.2.9.3~~ **1810.3.3.2 Allowable lateral load.** Where required by the design, the lateral load capacity of a ~~pier, a single pile~~ deep foundation element or a ~~pile~~ group thereof shall be determined by an approved method of analysis or by lateral load tests to at least twice the proposed design working load. The resulting allowable load shall not be more than one-half of that test load that produces a gross lateral movement of 1 inch (25 mm) at the ground surface.

~~4808.2.11~~ **1810.3.4 Piles in Subsiding areas soils.** Where ~~piles~~ deep foundation elements are installed through subsiding fills or other subsiding strata and derive support from underlying firmer materials, consideration shall be given to the downward frictional forces that may be imposed on the ~~piles~~ elements by the subsiding upper strata.

Where the influence of subsiding fills is considered as imposing loads on the ~~pile~~ element, the allowable stresses specified in this chapter ~~are~~ shall be permitted to be increased where satisfactory substantiating data are submitted.

1810.3.5 Dimensions of deep foundation elements. The dimensions of deep foundation elements shall be in accordance with Sections 1810.3.5.1 through 1810.3.5.3, as applicable.

~~4809.2.1.2~~ **1810.3.5.1 Minimum dimension Precast.** The minimum lateral dimension of precast concrete deep foundation elements shall be 8 inches (203 mm). Corners of square ~~piles~~ elements shall be chamfered.

1810.3.5.2 Cast-in-place or grouted-in-place. Cast-in-place and grouted-in-place deep foundation elements shall satisfy the requirements of this section.

1810.3.5.2.1 Cased. Cast-in-place deep foundation elements with a permanent casing shall have a nominal outside diameter of not less than 8 inches (203 mm).

~~4840.3.2~~ **1810.3.5.2.2 Dimensions Uncased.** Cast-in-place deep foundation elements without a permanent casing shall have a diameter of not less than 12 inches (305 mm). The ~~pile~~ element length shall not exceed 30 times the average diameter. ~~The minimum diameter shall be 12 inches (305 mm).~~

Exception: The length of the ~~pile~~ element is permitted to exceed 30 times the diameter, provided that the design and installation of the ~~pile foundation~~ deep foundations are under the direct supervision of a registered design professional knowledgeable in the field of soil mechanics and ~~pile~~ deep foundations. The registered design professional shall certify to the building official that the ~~piles~~ elements were installed in compliance with the approved construction documents.

1810.3.5.2.3 Micropiles. Micropiles shall have an outside diameter of 12 inches (305 mm) or less. There is no minimum diameter for micropiles.

1810.3.5.3 Steel. Steel deep foundation elements shall satisfy the requirements of this section.

~~4809.3.3~~ **1810.3.5.3.1 Dimensions of H-piles.** Sections of H-piles shall comply with the following:

1. The flange projections shall not exceed 14 times the minimum thickness of metal in either the flange or the web and the flange widths shall not be less than 80 percent of the depth of the section.
2. The nominal depth in the direction of the web shall not be less than 8 inches (203 mm).
3. Flanges and web shall have a minimum nominal thickness of 3/8 inch (9.5 mm).

~~1809.3.4~~ **1810.3.5.3.2 Dimensions of Steel pipes piles and tubes.** Steel pipe piles driven open-ended pipes and tubes used as deep foundation elements shall have a nominal outside diameter of not less than 8 inches (203 mm). ~~The pipe~~ Where steel pipes or tubes are driven open-ended, they shall have a minimum of 0.34 square inch (219 mm²) of steel in cross section to resist each 1,000 foot-pounds (1356 Nm) of pile hammer energy, or shall have the equivalent strength for steels having a yield strength greater than 35,000 psi (241 MPa) or the wave equation analysis shall be permitted to be used to assess compression stresses induced by driving to evaluate if the pile section is appropriate for the selected hammer. Where a pipe or tube with wall thickness less than 0.179 inch (4.6 mm) is driven open ended, a suitable cutting shoe shall be provided. Concrete filled steel pipes or tubes in structures assigned to Seismic Design Category C, D, E, or F shall have a wall thickness of not less than 3/16 inch (5 mm). The pipe or tube casing for socketed drilled shafts shall have a nominal outside diameter of not less than 18 inches (457 mm), a wall thickness of not less than 3/8 inch (9.5 mm), and a suitable steel driving shoe welded to the bottom; the diameter of the rock socket shall be approximately equal to the inside diameter of the casing.

Exceptions:

1. There is no minimum diameter for steel pipes or tubes used in micropiles.
2. ~~1810.6.3 Minimum dimensions.~~ Piles shall have a nominal outside diameter of not less than 8 inches (203 mm) and a minimum wall thickness in accordance with Section 1809.3.4. For mandrel-driven pipes or tubes piles, the minimum wall thickness shall be 1/10 inch (2.5 mm).

~~1808.2.7~~ **1810.3.6 Splices.** Splices shall be constructed so as to provide and maintain true alignment and position of the component parts of the pier or pile deep foundation element during installation and subsequent thereto and shall be of adequate strength to transmit the vertical and lateral loads and moments occurring at the location of the splice during driving and under service loading. ~~Where deep foundation elements of the same type are being spliced,~~ splices shall develop not less than 50 percent of the ~~least capacity of the pier or pile in bending~~ strength of the weaker section. Where deep foundation elements of different materials or different types are being spliced, splices shall develop the full compressive strength and not less than 50 percent of the tension and bending strength of the weaker section. Where structural steel cores are to be spliced, the ends shall be milled or ground to provide full contact and shall be full-depth welded.

In addition, Splices occurring in the upper 10 feet (3048 mm) of the embedded portion of the pier or pile an element shall be capable of resisting at allowable working stresses the moment and shear that would result from an assumed eccentricity of the pier or pile axial load of 3 inches (76 mm), or the pier or pile element shall be braced in accordance with Section ~~1808.2.5~~ 1810.2.2 to other piers or piles deep foundation elements that do not have splices in the upper 10 feet (3048 mm) of embedment.

1810.3.6.1 Seismic Design Categories C through F. For structures assigned to Seismic Design Category C, D, E, or F, splices of deep foundation elements shall develop the lesser of the following:

1. The full strength of the deep foundation element; and
2. The axial and shear forces and moments from the load combinations with overstrength factor in Section 12.4.3.2 of ASCE 7.

1810.3.7 Top of pile detailing at cutoffs. Where a minimum length for reinforcement or the extent of closely spaced confinement reinforcement is specified at the top of a deep foundation element, provisions shall be made so that those specified lengths or extents are maintained after cutoff.

~~1809.2~~ **Precast concrete piles.**

~~1809.2.4~~ **1810.3.8 General Precast concrete piles.** The materials, reinforcement and installation of Precast concrete piles shall conform to be designed and detailed in accordance with Sections 1809.2.1.1 through 1809.2.1.4 1810.3.8.1 through 1810.3.8.3.

~~1809.2.4.3~~ **1810.3.8.1 Reinforcement.** Longitudinal steel shall be arranged in a symmetrical pattern and be laterally tied with steel ties or wire spiral spaced center to center as follows:

1. At not more than 1 inch (25 mm) for the first five ties or spirals at each end; then
2. At not more than 4 inches (102 mm) apart, center to center, for a distance of the remainder of the first 2 feet (610 mm) from the ends of the pile each end; and then
3. At not more than 6 inches (152 mm) elsewhere except that at the ends of each pile, the first five ties or spirals shall be spaced 1 inch (25 mm) center to center.

The size gage of ties and spirals shall be as follows:

1. For piles having a diameter least horizontal dimension of 16 inches (406 mm) or less, wire shall not be smaller than 0.22 inch (5.6 mm) (No. 5 gage).
2. For piles having a diameter least horizontal dimension of more than 16 inches (406 mm) and less than 20 inches (508 mm), wire shall not be smaller than 0.238 inch (6 mm) (No. 4 gage).
3. For piles having a diameter least horizontal dimension of 20 inches (508 mm) and larger, wire shall not be smaller than 0.25 inch (6.4 mm) round or 0.259 inch (6.6 mm) (No. 3 gage).

~~1809.2.2~~ **1810.3.8.2 Precast nonprestressed piles.** Precast nonprestressed concrete piles shall ~~conform to~~ comply with the requirements of Sections 1809.2.2.1 through 1809.2.2.5 1810.3.8.2.1 through 1810.3.8.2.3.

~~1809.2.2.2~~ **1810.3.8.2.1 Minimum reinforcement.** The ~~minimum amount of~~ Longitudinal reinforcement shall be 0.8 percent of the concrete section and shall consist of at least four bars ~~consist of at least four bars with a minimum longitudinal reinforcement ratio of 0.008.~~

~~1809.2.2.2.1~~ **1810.3.8.2.2 Seismic reinforcement in Seismic Design Category Categories C through F.** ~~Where a For structures is assigned to Seismic Design Category C, D, E, or F in accordance with Section 1613, the following shall apply~~ precast nonprestressed piles shall be reinforced as specified in this section. The minimum longitudinal reinforcement with a minimum steel ratio of shall be 0.01 shall be provided throughout the length of precast concrete piles. Within three pile diameters of the bottom of the pile cap, the longitudinal reinforcement shall be confined with Transverse reinforcement shall consist of closed ties or spirals of with a minimum 3/8 inch (9.5 mm) diameter. Ties or spirals shall be provided at a maximum spacing of Spacing of transverse reinforcement shall not exceed the smaller of eight times the diameter of the smallest longitudinal bar not to exceed or, 6 inches (152 mm) within a distance of three times the least pile dimension from the bottom of the pile cap. Spacing of transverse reinforcement shall not exceed 6 inches (152 mm) throughout the remainder of the pile, the closed ties or spirals shall have a maximum spacing of 16 times the smallest longitudinal bar diameter, not to exceed 8 inches (203 mm).

~~1809.2.2.2.2~~ **1810.3.8.2.3 Additional seismic reinforcement in Seismic Design Category Categories D through, E or F.** ~~Where a For structures is assigned to Seismic Design Category D, E or F in accordance with Section 1613, the requirements for Seismic Design Category C in Section 1809.2.2.2.1 shall apply except as modified by this section. Transverse confinement reinforcement consisting of closed ties or equivalent spirals shall be provided in accordance with Sections 21.4.4.1, 21.4.4.2 and 21.4.4.3 of ACI 318 within three pile diameters of the bottom of the pile cap. For other than Site Class E or F, or liquefiable sites and where spirals are used as the transverse reinforcement, it shall be permitted to use a volumetric ratio of spiral reinforcement of not less than one-half that required by Section 21.4.4.1(a) of ACI 318~~ transverse reinforcement shall be in accordance with Section 1810.3.9.4.2.

~~1809.2.3~~ **1810.3.8.3 Precast prestressed piles.** Precast prestressed concrete piles shall ~~conform to~~ comply with the requirements of Sections 1809.2.3.1 through 1809.2.3.5 1810.3.8.3.1 through 1810.3.8.3.3.

~~1809.2.3.2~~ **1810.3.8.3.1 Design Effective prestress.** Precast prestressed piles shall be designed to resist stresses induced by handling and driving as well as by loads. The effective prestress in the pile shall not be less than 400 psi (2.76MPa) for piles up to 30 feet (9144 mm) in length, 550 psi (3.79 MPa) for piles up to 50 feet (15 240 mm) in length and 700 psi (4.83 MPa) for piles greater than 50 feet (15 240 mm) in length.

Effective prestress shall be based on an assumed loss of 30,000 psi (207 MPa) in the prestressing steel. The tensile stress in the prestressing steel shall not exceed the values specified in ACI 318.

~~1809.2.3.2.1~~ **1810.3.8.3.2 Design Seismic reinforcement in Seismic Design Category C.** ~~Where a For structures is assigned to Seismic Design Category C in accordance with Section 1613, the following shall apply~~ precast prestressed piles shall have transverse reinforcement in accordance with this section. The minimum volumetric ratio of spiral reinforcement shall not be less than 0.007 or the amount required by the following formula for the upper 20 feet (6096 mm) of the pile.

$$\rho_s = 0.12 f'_c / f_{yh} \quad (\text{Equation 18-4})$$

where:

f'_c = Specified compressive strength of concrete, psi (MPa)

f_{yh} = Yield strength of spiral reinforcement \leq 85,000 psi (586 MPa).

ρ_s = Spiral reinforcement index (vol. spiral/vol. core).

At least one-half the volumetric ratio required by Equation 18-4 shall be provided below the upper 20 feet (6096 mm) of the pile.

The pile cap connection by means of dowels as indicated in Section 1808.2.23.1 is permitted. Pile cap connection by means of developing pile reinforcing strand is permitted provided that the pile reinforcing strand results in a ductile connection.

1809.2.3.2.2 1810.3.8.3.3 Design Seismic reinforcement in Seismic Design Category Categories D through, E or F. ~~Where a~~ For structures is assigned to Seismic Design Category D, E or F in accordance with Section 1613, the requirements for Seismic Design Category C in Section 1809.2.3.2.1 shall be met, in addition to precast prestressed piles shall have transverse reinforcement in accordance with the following:

1. Requirements in ACI 318, Chapter 21, need not apply, unless specifically referenced.
2. Where the total pile length in the soil is 35 feet (10 668 mm) or less, the lateral transverse reinforcement in the ductile region shall occur through the length of the pile. Where the pile length exceeds 35 feet (10 668 mm), the ductile pile region shall be taken as the greater of 35 feet (10 668 mm) or the distance from the underside of the pile cap to the point of zero curvature plus three times the least pile dimension.
3. In the ductile region, the center-to-center spacing of the spirals or hoop reinforcement shall not exceed one-fifth of the least pile dimension, six times the diameter of the longitudinal strand, or 8 inches (203 mm), whichever is ~~smaller~~ smallest.
4. Circular spiral reinforcement shall be spliced by lapping one full turn and bending the end of ~~the~~ each spiral to a 90-degree hook or by use of a mechanical or welded splice complying with Sec. 12.14.3 of ACI 318.
5. Where the transverse reinforcement consists of circular spirals, the volumetric ratio of spiral transverse reinforcement in the ductile region shall comply with the following:

$$\rho_s = 0.25(f'_c / f_{yh})(A_g / A_{ch} - 1.0)[0.5 + 1.4P / (f'_c A_g)] \quad \text{(Equation 18-5)}$$

but not less than:

$$\rho_s = 0.12(f'_c / f_{yh}) [0.5 + 1.4P / (f'_c A_g)] \geq 0.12 f'_c / f_{yh} \quad \text{(Equation 18-6)}$$

and need not exceed:

$$\rho_s = 0.021 \quad \text{(Equation 18-7)}$$

where:

- A_g = Pile cross-sectional area, square inches (mm²).
- A_{ch} = Core area defined by spiral outside diameter, square inches (mm²).
- f'_c = Specified compressive strength of concrete, psi (MPa)
- f_{yh} = Yield strength of spiral reinforcement \leq 85,000 psi (586 MPa).
- P = Axial load on pile, pounds (kN), as determined from Equations 16-5 and ~~46-6~~ 16-7.
- ρ_s = Volumetric ratio (vol. spiral/ vol. core).

This required amount of spiral reinforcement is permitted to be obtained by providing an inner and outer spiral.

6. ~~When~~ Where transverse reinforcement consists of rectangular hoops and cross ties, the total cross-sectional area of lateral transverse reinforcement in the ductile region with spacing, s, and perpendicular ~~to~~ dimension, h_c , shall conform to:

$$A_{sh} = 0.3s h_c (f'_c / f_{yh})(A_g / A_{ch} - 1.0)[0.5 + 1.4P / (f'_c A_g)] \quad \text{(Equation 18-8)}$$

but not less than:

$$A_{sh} = 0.12s h_c (f'_c / f_{yh}) [0.5 + 1.4P / (f'_c A_g)] \quad \text{(Equation 18-9)}$$

where:

- f_{yh} = \leq 70,000 psi (483 MPa).
- h_c = Cross-sectional dimension of pile core measured center to center of hoop reinforcement, inch (mm).
- s = Spacing of transverse reinforcement measured along length of pile, inch (mm).
- A_{sh} = Cross-sectional area of tranverse reinforcement, square inches (mm²)
- f'_c = Specified compressive strength of concrete, psi (MPa)

The hoops and cross ties shall be equivalent to deformed bars not less than No. 3 in size. Rectangular hoop ends shall terminate at a corner with seismic hooks.

Outside of the length of the pile requiring transverse confinement reinforcing, the spiral or hoop reinforcing with a volumetric ratio not less than one-half of that required for transverse confinement reinforcing shall be provided.

1810.3.9 Cast-in-place deep foundations. Cast-in-place deep foundation elements shall be designed and detailed in accordance with Sections 1810.3.9.1 through 1810.3.9.6.

1810.3.9.1 Design cracking moment. The design cracking moment (M_n) for a cast-in-place deep foundation element not enclosed by a structural steel pipe or tube shall be determined using the following equation:

$$\phi M_n = 3\sqrt{f'_c} S_m \quad \text{(Equation 18-10)}$$

where:

$$f'_c = \text{Specified compressive strength of concrete or grout, psi (MPa)}$$

$$S_m = \text{Elastic section modulus, neglecting reinforcement and casing, in}^3 \text{ (mm}^3\text{)}$$

1810.3.9.2 Required reinforcement. Where subject to uplift or where the required moment strength determined using the load combinations of Section 1605.2 exceeds the design cracking moment determined in accordance with Section 1810.3.9.1, cast-in-place deep foundations not enclosed by a structural steel pipe or tube shall be reinforced.

1810.3.9.3 Placement of reinforcement. Except for steel dowels embedded 5 feet (1524 mm) or less in the pile and as provided in Section 1810.3.4, Reinforcement where required shall be assembled and tied together and shall be placed in the pile deep foundation element as a unit before the reinforced portion of the pile element is filled with concrete except in augered uncased cast-in-place piles. Tied reinforcement in augered uncased cast-in-place piles shall be placed after piles are concreted, while the concrete is still in a semifluid state.

Exceptions:

1. Steel dowels embedded 5 feet (1524 mm) or less shall be permitted to be placed after concreting, while the concrete is still in a semifluid state.
2. **1810.3.4 Reinforcement.** For piles deep foundation elements installed with a hollow-stem auger where full-length, tied reinforcement shall be placed after elements are concreted, while the concrete is still in a semifluid state. Longitudinal steel reinforcement is placed without lateral ties, the reinforcement shall be placed either through the hollow stem of the auger prior to filling the pile with concrete concreting or after concreting, while the concrete is still in a semifluid state. All pile reinforcement shall have a concrete cover of not less than 2.5 inches (64 mm).

Exception: Where physical constraints do not allow the placement of the longitudinal reinforcement prior to filling the pile with concrete or where partial-length longitudinal reinforcement is placed without lateral ties, the reinforcement is allowed to be placed after the piles are completely concreted but while concrete is still in a semifluid state.

3. For Group R-3 and U occupancies not exceeding two stories of light-frame construction, reinforcement is permitted to be placed after concreting, while the concrete is still in a semifluid state, and the concrete cover requirement is permitted to be reduced to 2 inches (51 mm), provided the construction method can be demonstrated to the satisfaction of the building official.

1812.4 1810.3.9.4 Reinforcement Seismic reinforcement. Except for steel dowels embedded 5 feet (1524 mm) or less in the pier, reinforcement where required shall be assembled and tied together and shall be placed in the pier hole as a unit before the reinforced portion of the pier is filled with concrete. Where a structure is assigned to Seismic Design Category C reinforcement shall be provided in accordance with Section 1810.3.9.4.1. Where a structure is assigned to Seismic Design Category D, E, or F reinforcement shall be provided in accordance with Section 1810.3.9.4.2.

Exception: Reinforcement is permitted to be wet set and the 2-1/2 inch (64 mm) concrete cover requirement be reduced to 2 inches (51 mm) for Group R-3 and U occupancies not exceeding two stories of light frame construction, provided the construction method can be demonstrated to the satisfaction of the building official.

Reinforcement shall conform to the requirements of Sections 1810.1.2.1 and 1810.1.2.2.

Exceptions:

1. ~~Isolated piers deep foundation elements supporting posts of Group R-3 and U occupancies not exceeding two stories of light-frame construction are~~ shall be permitted to be reinforced as required by rational analysis but with not less than a minimum of one No. 4 bar, without ties or spirals, when where detailed so the pier element is not subject to lateral loads and the soil is determined to be of adequate stiffness provides adequate lateral support in accordance with Section 1810.2.1.
2. ~~Isolated piers deep foundation elements supporting posts and bracing from decks and patios appurtenant to Group R-3 and U occupancies not exceeding two stories of light-frame construction are~~ shall be permitted to be reinforced as required by rational analysis but with not less than one No. 4 bar, without ties or spirals, when where the lateral load, E , to the top of the pier element does not exceed 200 pounds (890 N) and the soil is determined to be of adequate stiffness provides adequate lateral support in accordance with Section 1810.2.1.
3. ~~Piers Deep foundation elements supporting the concrete foundation wall of Group R-3 and U occupancies not exceeding two stories of light-frame construction are~~ shall be permitted to be reinforced as required by rational analysis but with not less than two No. 4 bars, without ties or spirals, when it can be shown the concrete pier will not rupture when designed for the maximum seismic load, E_{m1} , where the design cracking moment determined in accordance with Section 1810.3.9.1 exceeds the required moment strength determined using the load combinations with overstrength factor in Section 12.4.3.2 of ASCE 7 and the soil is determined to be of adequate stiffness provides adequate lateral support in accordance with Section 1810.2.1.
4. ~~Closed ties or spirals where required by Section 1810.1.2.2 1810.3.9.4.2 are~~ shall be permitted to be limited to the top 3 feet (914 mm) of the piers deep foundation elements 10 feet (3048 mm) or less in depth supporting Group R-3 and U occupancies of Seismic Design Category D, not exceeding two stories of light-frame construction.

1810.1.2.1 1810.3.9.4.1 Seismic reinforcement in Seismic Design Category C. ~~For Where a structures is assigned to Seismic Design Category C in accordance with Section 1613, the following shall apply~~ cast-in-place deep foundation elements shall be reinforced as specified in this section. Reinforcement shall be provided where required by analysis.

A minimum of four longitudinal bars, with a minimum longitudinal reinforcement ratio of 0.0025, shall be provided for uncased cast-in-place concrete drilled or augered piles, piers or caissons in the top throughout the minimum reinforced length of the element as defined below starting at the top of the element. The minimum reinforced length of the element shall be taken as the greatest of the following:

1. One-third of the pile element length;
2. A minimum length distance of 10 feet (3048 mm);
3. Three times the least element dimension; and
4. The distance from the top of the element to the point where the design cracking moment determined in accordance with Section 1810.3.9.1 exceeds the required moment strength determined using the load combinations of Section 1605.2. below the ground or that required by analysis, whichever length is greatest. The minimum reinforcement ratio, but no less than that ratio required by rational analysis, shall be continued throughout the flexural length of the pile. There shall be a minimum of four longitudinal bars with

Transverse reinforcement shall consist of closed ties (or equivalent spirals) of with a minimum 3/8 inch (9.5 mm) diameter provided at 16 longitudinal-bar diameter maximum spacing. Transverse confinement reinforcement with a maximum. Spacing of transverse reinforcement shall not exceed the smaller of 6 inches (152 mm) or 8-longitudinal-bar diameters, whichever is less, shall be provided within a distance equal to of three times the least pile element dimension of from the bottom of the pile cap. Spacing of transverse reinforcement shall not exceed 16 longitudinal bar diameters throughout the remainder of the reinforced length.

Exceptions:

1. The requirements of this section shall not apply to concrete cast in structural steel pipes or tubes.
2. A spiral-welded metal casing of a thickness not less than manufacturer's standard gage No. 14 gage (0.068 inch) is permitted to provide concrete confinement in lieu of the closed ties or spirals. Where used as such, the metal casing shall be protected against possible deleterious action due to soil constituents, changing water levels or other factors indicated by boring records of site conditions.

1810.1.2.2 1810.3.9.4.2 Seismic reinforcement in Seismic Design Category Categories D, E or through F. ~~For Where a structures is assigned to Seismic Design Category D, E or F in accordance with Section 1613, the requirements for Seismic Design Category C given above shall be met, in addition to the following~~ cast-in-place deep foundation elements shall be reinforced as specified in this section. Reinforcement shall be provided where required by analysis.

A minimum of four longitudinal bars, with a minimum longitudinal reinforcement ratio of 0.005 shall be provided for uncased cast-in-place drilled or augered concrete piles, piers or caissons in the top throughout the minimum reinforced length of the element as defined below starting at the top of the element. The minimum reinforced length of the element shall be taken as the greatest of the following:

1. One-half of the pile element length;
2. A minimum length distance of 10 feet (3048 mm);
3. Three times the least element dimension; and
4. The distance from the top of the element to the point where the design cracking moment determined in accordance with Section 1810.3.9.1 exceeds the required moment strength determined using the load combinations of Section 1605.2.

~~below ground or throughout the flexural length of the pile, whichever length is greatest. The flexural length shall be taken as the length of the pile to a point where the concrete section cracking moment strength multiplied by 0.4 exceeds the required moment strength at that point. There shall be a minimum of four longitudinal bars with transverse confinement reinforcement provided in the pile in accordance with Sections 21.4.4.1, 21.4.4.2 and 21.4.4.3 of ACI 318 within three times the least pile dimension of the bottom of the pile cap. A transverse spiral reinforcement ratio of not less than one-half of that required in Section 21.4.4.1(a) of ACI 318 for other than Class E, F or liquefiable sites is permitted. Tie spacing throughout the remainder of the concrete section shall not exceed 12 longitudinal bar diameters, one-half the least dimension of the section, nor 12 inches (305 mm). Ties shall be a minimum of No. 3 bars for piles with a least dimension up to 20 inches (508 mm), and No. 4 bars for larger piles.~~

Transverse reinforcement shall consist of closed ties or spirals no smaller than No. 3 bars for elements with a least dimension up to 20 inches (508 mm), and No. 4 bars for larger elements. Throughout the remainder of the reinforced length outside the regions with transverse confinement reinforcement, as specified in Section 1810.3.9.4.2.1 or 1810.3.9.4.2.2, the spacing of transverse reinforcement shall not exceed the least of the following:

1. 12 longitudinal bar diameters;
2. One-half the least dimension of the element; and
3. 12 inches (305 mm).

Exceptions:

1. The requirements of this section shall not apply to concrete cast in structural steel pipes or tubes.
2. **1810.5.4.1 Seismic reinforcement.** Where a structure is assigned to Seismic Design Category C, D, E or F in accordance with Section 1613, the reinforcement requirements for drilled or augered uncased piles in Section 1810.3.5 shall be met.

Exception: A spiral-welded metal casing of a thickness not less than manufacturer's standard gage No. 14 gage (0.068 inch) is permitted to provide concrete confinement in lieu of the closed ties or equivalent spirals required in an uncased concrete pile. Where used as such, the metal casing shall be protected against possible deleterious action due to soil constituents, changing water levels or other factors indicated by boring records of site conditions.

1810.3.9.4.2.1 Site Classes A through D. For Site Class A, B, C, or D sites, transverse confinement reinforcement shall be provided in the element in accordance with Sections 21.4.4.1, 21.4.4.2 and 21.4.4.3 of ACI 318 within three times the least element dimension of the bottom of the pile cap. A transverse spiral reinforcement ratio of not less than one-half of that required in Section 21.4.4.1(a) of ACI 318 shall be permitted.

1810.3.9.4.2.2 Site Classes E and F. For Site Class E or F sites, transverse confinement reinforcement shall be provided in the element in accordance with Sections 21.4.4.1, 21.4.4.2 and 21.4.4.3 of ACI 318 within seven times the least element dimension of the pile cap and within seven times the least element dimension of the interfaces of strata that are hard or stiff and strata that are liquefiable or are composed of soft to medium stiff clay.

1810.3.9.5 Belled bottoms drilled shafts. Where pier foundations drilled shafts are belled at the bottom, the edge thickness of the bell shall not be less than that required for the edge of footings. Where the sides of the bell slope at an angle less than 60 degrees (1 rad) from the horizontal, the effects of vertical shear shall be considered.

1810.3.9.6 Construction Socketed drilled shafts. Caisson piles shall consist of a shaft section of concrete-filled pipe extending to bedrock with an uncased socket drilled into the bedrock and filled with concrete. Socketed drilled shafts shall have a permanent pipe or tube casing that extends down to bedrock and an uncased socket drilled into the bedrock, both filled with concrete. The caisson pile Socketed drilled shafts shall have a full-length structural steel core or a stub core installed in the rock socket and extending into the pipe portion a distance equal to the socket depth.

1810.7.3 Design. The depth of the rock socket shall be sufficient to develop the full load-bearing capacity of the caisson pile element with a minimum safety factor of two, but the depth shall not be less than the outside diameter of the pipe or tube casing. The design of the rock socket is permitted to be predicated on the sum of the allowable load-bearing pressure on the bottom of the socket plus bond along the sides of the socket. ~~The minimum outside diameter of the caisson pile shall be 18 inches (457 mm), and the diameter of the rock socket shall be approximately equal to the inside diameter of the pile.~~

1810.7.4 Structural core. The gross cross-sectional area of the structural steel core shall not exceed 25 percent of the gross area of the caisson drilled shaft. ~~The minimum clearance between the structural core and the pipe shall be 2 inches (51 mm). Where cores are to be spliced, the ends shall be milled or ground to provide full contact and shall be full-depth welded.~~

1810.8 1810.3.10 (Supp) Micropiles. ~~Micropiles shall comply with the requirements of~~ be designed and detailed in accordance with Sections 1810.8.1 through 1810.8.5 1810.3.10.1 through 1810.3.10.4.

1810.8.1 1810.3.10.1 (Supp) Construction. ~~Micropiles shall consist of a grouted section reinforced with steel pipe or steel reinforcement. Micropiles shall develop their load-carrying capacity through by means of a bond zone in soil, bedrock or a combination of soil and bedrock. The steel pipe or steel reinforcement shall extend the full length of the micropile. Micropiles shall be grouted and have either a steel pipe or tube or steel reinforcement at every section along the length. It shall be permitted to transition from deformed reinforcing bars to steel pipe or tube reinforcement by extending the bars into the pipe or tube section by at least their tension development length.~~

1810.8.2 1810.3.10.2 (Supp) Materials. Grout shall have a specified compressive strength (f'_c) of not less than 4,000 psi (27.58 Mpa). The grout mix shall be designed and proportioned so as to produce a pumpable mixture. Reinforcement shall consist of deformed reinforcing bars in accordance with ASTM A 615 Grade 60 or 75 or ASTM A 722 Grade 150.

The steel pipe or tube shall have a minimum wall thickness of 3/16 inch (4.8 mm). Splices shall comply with Section ~~1808.2.7~~ 1810.3.6. The steel pipe or tube shall have a minimum yield strength ~~exceeding~~ of 45,000 psi (310 MPa) and a minimum elongation of 15 percent as shown by mill certifications or two coupon test samples per 40,000 pounds (18 160 kg) of pipe or tube.

1810.8.4 1810.3.10.3 (Supp) Reinforcement. For micropiles or portions thereof ~~piles~~ grouted inside a temporary or permanent casing or inside a hole drilled into bedrock or a hole drilled with grout, the steel pipe or tube or steel reinforcement shall be designed to carry at least 40 percent of the design compression load. Micropiles or portions thereof ~~piles~~ grouted in an open hole in soil without temporary or permanent casing and without suitable means of verifying the hole diameter during grouting shall be designed to carry the entire compression load in the reinforcing steel. Where a steel pipe or tube is used for reinforcement, the portion of the grout enclosed within the pipe is permitted to be included in the determination of the allowable stress in the grout.

1810.8.4.1 1810.3.10.4 (Supp) Seismic reinforcement. ~~Where a For structures is assigned to Seismic Design Category C, a permanent steel casing shall be provided from the top of the micropile down a minimum of 120 percent of the flexural length to the point of zero curvature. Where a For structures is assigned to Seismic Design D, E or F, the micropile shall be considered as an alternative system in accordance with Section 104.11. The alternative pile system design, supporting documentation and test data shall be submitted to the building official for review and approval.~~

1808.2.4 1810.3.11 Pile caps. Pile caps shall be of reinforced concrete, and shall include all elements to which ~~piles~~ vertical deep foundation elements are connected, including grade beams and mats. The soil immediately below the pile cap shall not be considered as carrying any vertical load. The tops of ~~piles~~ vertical deep foundation elements shall be embedded not less than 3 inches (76 mm) into pile caps and the caps shall extend at least 4 inches (102 mm) beyond the edges of ~~piles~~ the elements. The tops of ~~piles~~ elements shall be cut or chipped back to sound material before capping.

1808.2.23.1.4 1810.3.11.1 Connection to pile cap Seismic Design Categories C through F. ~~Concrete piles and concrete-filled steel pipe piles For structures assigned to Seismic Design Category C, D, E, or F in accordance with Section 1613, concrete deep foundation elements shall be connected to the pile cap by embedding the pile element reinforcement or field-placed dowels anchored in the concrete pile element into the pile cap for a distance equal to the their development length in accordance with ACI 318. It shall be permitted to connect precast prestressed piles to the pile cap by developing the element prestressing strands into the pile cap provided the connection is ductile. For deformed bars, the development length is the full development length for compression, or tension; in the case of uplift, without reduction in length for excess area reinforcement in accordance with Section 12.2.5 of ACI 318.~~

Alternative measures for laterally confining concrete and maintaining toughness and ductile-like behavior at the top of the ~~pile will element~~ shall be permitted provided the design is such that any hinging occurs in the confined region.

~~Ends of hoops, spirals and ties shall be terminated with seismic hooks, as defined in Section 21.1 of ACI 318 turned into the confined concrete core.~~ The minimum transverse steel ratio for confinement shall not be less than one-half of that required for columns.

For resistance to uplift forces, anchorage of steel pipe ~~(round HSS sections), concrete-filled steel pipe or pipes, tubes, or H-piles~~ to the pile cap shall be made by means other than concrete bond to the bare steel section. Concrete-filled steel pipes or tubes shall have reinforcement of not less than 0.01 times the cross-sectional area of the concrete fill developed into the cap and extending into the fill a length equal to two times the required cap embedment, but not less than the tension development length of the reinforcement.

Exception: ~~Anchorage of concrete-filled steel pipe piles is permitted to be accomplished using deformed bars developed into the concrete portion of the pile.~~

Splices of pile segments shall develop the full strength of the pile, but the splice need not develop the nominal strength of the pile in tension, shear and bending when it has been designed to resist axial and shear forces and moments from the load combinations of Section 1605.4.

~~1808.2.23.2.2~~ **1810.3.11.2 Connection to pile cap Seismic Design Categories D through F.** For piles required to resist structures assigned to Seismic Design Category D, E, or F in accordance with Section 1613, ~~deep foundation element resistance to uplift forces or provide rotational restraint, design of anchorage of piles into the pile cap shall be provided~~ shall be provided by anchorage into the pile cap, designed considering the combined effect of axial forces due to uplift and bending moments due to fixity to the pile cap. Anchorage shall develop a minimum of 25 percent of the strength of the ~~pile element~~ in tension. Anchorage into the pile cap shall be capable of developing the following:

1. In the case of uplift, the lesser ~~least~~ of the following: nominal tensile strength of the longitudinal reinforcement in a concrete ~~pile element~~; or the nominal tensile strength of a steel ~~pile element~~; or the ~~pile uplift soil nominal strength factored~~ frictional force developed between the element and the soil multiplied by 1.3; or ~~and~~ the axial tension force resulting from the load combinations of Section 1605.4.
2. In the case of rotational restraint, the lesser of ~~the following~~: the axial ~~and~~ force, shear forces, and bending moments resulting from the load combinations of Section 1605.4; or ~~and~~ development of the full axial, bending and shear nominal strength of the ~~pile element~~.

~~1808.2.23.2.3~~ **Flexural strength.** Where the vertical lateral-force-resisting elements are columns, the ~~grade beam or pile cap~~ flexural strengths shall exceed the column flexural strength. The connection between batter piles and ~~grade beams or pile caps~~ shall be designed to resist the nominal strength of the pile acting as a short column. Batter piles and their connection shall be capable of resisting forces and moments from the load combinations of Section 1605.4.

1810.3.12 Grade beams. For structures assigned to Seismic Design Category D, E, or F in accordance with Section 1613, grade beams shall comply with the provisions in Section 21.10.3 of ACI 318 for grade beams, ~~except where they have the capacity to resist the forces from the load combinations with overstrength factor in Section 12.4.3.2 of ASCE 7.~~

~~1808.2.23.4~~ **1810.3.13 (Supp) Seismic Design Category C Seismic ties.** Where a ~~For~~ structures is assigned to Seismic Design Category C, D, E, or F in accordance with Section 1613, ~~the following shall apply.~~ Individual ~~pile caps, piers or piles~~ deep foundations shall be interconnected by ties. Ties shall be capable of carrying, in tension and compression, a force equal to the product of the larger pile cap or column load times the seismic coefficient, S_{DS} , divided by 10 unless it can be demonstrated that equivalent restraint is provided by reinforced concrete beams within slabs on grade or reinforced concrete slabs on grade or confinement by competent rock, hard cohesive soils or very dense granular soils.

Exception: In Group R-3 and U occupancies of light-frame construction, ~~pier foundations~~ deep foundation elements supporting foundation walls, isolated interior posts detailed so the ~~pier element~~ is not subject to lateral loads, or exterior decks and patios are not subject to interconnection if it can be shown where the soils are of adequate stiffness, subject to the approval of the building official.

1810.4 Installation. Deep foundations shall be installed in accordance with Section 1810.4. Where a single deep foundation element comprises two or more sections of different materials or different types spliced together, each section shall satisfy the applicable conditions of installation.

~~4808.2.6~~ **1810.4.1 Structural integrity.** ~~Piers or piles~~ Deep foundation elements shall be installed in such a manner and sequence as to prevent distortion or damage that may adversely affect the structural integrity of ~~piles adjacent structures or of foundation elements~~ being installed or already in place and as to avoid compacting the surrounding soil to the extent that other foundation elements cannot be installed properly.

~~4809.2.2.4~~ **1810.4.1.1 Installation Compressive strength of precast concrete piles.** A precast concrete pile shall not be driven before the concrete has attained a compressive strength of at least 75 percent of the ~~28-day~~ specified compressive strength (f'_c), but not less than the strength sufficient to withstand handling and driving forces.

1810.4.1.2 Casing. Where cast-in-place deep foundation elements are formed through unstable soils and concrete is placed in an open-drilled hole, a casing shall be inserted in the hole prior to placing the concrete. Where the casing is withdrawn during concreting, the level of concrete shall be maintained above the bottom of the casing at a sufficient height to offset any hydrostatic or lateral soil pressure. Driven casings shall be mandrel driven their full length in contact with the surrounding soil.

~~4810.4.3~~ **1810.4.1.3 Installation Driving near uncased concrete.** ~~Piles~~ Deep foundation elements shall not be driven within six ~~pile element~~ diameters center to center in granular soils or within one-half the ~~pile element~~ length in cohesive soils of a ~~pile an uncased element~~ filled with concrete less than 48 hours old unless approved by the building official. If the concrete surface in any completed ~~pile element~~ rises or drops, the ~~pile element~~ shall be replaced. ~~Piles~~ Driven uncased deep foundation elements shall not be installed in soils that could cause ~~pile~~ heave.

~~4810.5.3~~ **1810.4.1.4 Installation Driving near cased concrete.** Steel shells shall be mandrel driven their full length in contact with the surrounding soil.

~~The steel shells shall be driven in such order and with such spacing as to ensure against distortion of or injury to piles already in place. A pile~~ Deep foundation elements shall not be driven within four and one-half average ~~pile~~ diameters of a ~~pile cased element~~ filled with concrete less than 24 hours old unless approved by the building official. Concrete shall not be placed in ~~steel shells~~ casings within heave range of driving.

~~4809.1.3~~ **1810.4.1.5 Defective timber piles.** Any substantial sudden increase in rate of penetration of a timber pile shall be investigated for possible damage. If the sudden increase in rate of penetration cannot be correlated to soil strata, the pile shall be removed for inspection or rejected.

~~4808.2.20~~ **1810.4.2 Identification.** ~~Pier or pile~~ Deep foundation materials shall be identified for conformity to the specified grade with this identity maintained continuously from the point of manufacture to the point of installation or shall be tested by an approved agency to determine conformity to the specified grade. The approved agency shall furnish an affidavit of compliance to the building official.

~~4808.2.24~~ **1810.4.3 Pier or pile Location plan.** A plan showing the location and designation of ~~piers or piles~~ deep foundation elements by an identification system shall be filed with the building official prior to installation of such ~~piers or piles elements~~. Detailed records for ~~piers or individual piles elements~~ shall bear an identification corresponding to that shown on the plan.

~~4808.2.43~~ **1810.4.4 Preexcavation.** The use of jetting, augering or other methods of preexcavation shall be subject to the approval of the building official. Where permitted, preexcavation shall be carried out in the same manner as used for ~~piers or piles~~ deep foundation elements subject to load tests and in such a manner that will not impair the carrying capacity of the ~~piers or piles elements~~ already in place or damage adjacent structures. ~~Pile~~ Element tips shall be driven below the preexcavated depth until the required resistance or penetration is obtained.

~~4808.2.45~~ **1810.4.5 Use of Vibratory drivers driving.** Vibratory drivers shall only be used to install ~~piles~~ deep foundation elements where the ~~pile element~~ load capacity is verified by load tests in accordance with Section ~~4808.2.8.3~~ 1810.3.3.1.2. The installation of production ~~piles elements~~ shall be controlled according to power consumption, rate of penetration or other approved means that ensure ~~pile element~~ capacities equal or exceed those of the test ~~piles elements~~.

~~4808.2.49~~ **1810.4.6 Heaved piles elements.** ~~Piles~~ Deep foundation elements that have heaved during the driving of adjacent ~~piles elements~~ shall be redriven as necessary to develop the required capacity and penetration, or the capacity of the ~~pile element~~ shall be verified by load tests in accordance with Section ~~4808.2.8.3~~ 1810.3.3.1.2.

1810.4.7 Enlarged base cast-in-place elements ~~1810.2.3 Installation.~~ Enlarged bases for cast-in-place deep foundation elements formed either by compacting concrete or by driving a precast base shall be formed in or driven into granular soils. ~~Piles~~ Such elements shall be constructed in the same manner as successful prototype test ~~piles~~

elements driven for the project. Pile Shafts extending through peat or other organic soil shall be encased in a permanent steel casing. Where a cased shaft is used, the shaft shall be adequately reinforced to resist column action or the annular space around the pile shaft shall be filled sufficiently to reestablish lateral support by the soil. Where pile heave occurs, the pile element shall be replaced unless it is demonstrated that the pile element is undamaged and capable of carrying twice its design load.

~~1810.3.3~~ **1810.4.8 Installation Hollow-stem augered, cast-in-place elements.** ~~Where pile shafts are formed through unstable soils and concrete is placed in an open drilled hole, a steel liner shall be inserted in the hole prior to placing the concrete. Where the steel liner is withdrawn during concreting, the level of concrete shall be maintained above the bottom of the liner at a sufficient height to offset any hydrostatic or lateral soil pressure.~~

Where concrete is placed by pumping through a hollow-stem auger, the auger shall be permitted to rotate in a clockwise direction during withdrawal. The auger shall be withdrawn in continuous increments. Concreting pumping pressures shall be measured and maintained high enough at all times to offset hydrostatic and lateral earth pressures. Concrete volumes shall be measured to ensure that the volume of concrete placed in each pile element is equal to or greater than the theoretical volume of the hole created by the auger. Where the installation process of any pile element is interrupted or a loss of concreting pressure occurs, the pile element shall be redrilled to 5 feet (1524 mm) below the elevation of the tip of the auger when the installation was interrupted or concrete pressure was lost and reformed. Augered cast-in-place piles elements shall not be installed within six pile diameters center to center of a pile an element filled with concrete less than 12 hours old, unless approved by the building official. If the concrete level in any completed pile element drops due to installation of an adjacent pile element, the pile element shall be replaced.

~~1810.7.6~~ **1810.4.9 Installation Socketed drilled shafts.** ~~The rock socket and pile pipe or tube casing of socketed drilled shafts shall be thoroughly cleaned of foreign materials before filling with concrete. Steel cores shall be bedded in cement grout at the base of the rock socket. Concrete shall not be placed through water except where a tremie or other approved method is used.~~

~~1810.8.5~~ **1810.4.10 Installation Micropiles.** ~~The pile Micropile deep foundation elements shall be permitted to be formed in a holes advanced by rotary or percussive drilling methods, with or without casing. The pile elements shall be grouted with a fluid cement grout. The grout shall be pumped through a tremie pipe extending to the bottom of the pile element until grout of suitable quality returns at the top of the pile element. The following requirements apply to specific installation methods:~~

1. For micropiles grouted inside a temporary casing, the reinforcing bars shall be inserted prior to withdrawal of the casing. The casing shall be withdrawn in a controlled manner with the grout level maintained at the top of the pile element to ensure that the grout completely fills the drill hole. During withdrawal of the casing, the grout level inside the casing shall be monitored to ~~check~~ verify that the flow of grout inside the casing is not obstructed.
2. For a micropile or portion thereof a pile grouted in an open drill hole in soil without temporary casing, the minimum design diameter of the drill hole shall be verified by a suitable device during grouting.
3. For micropiles designed for end bearing, a suitable means shall be employed to verify that the bearing surface is properly cleaned prior to grouting.
4. Subsequent micropiles shall not be drilled near piles elements that have been grouted until the grout has had sufficient time to harden.
5. Micropiles shall be grouted as soon as possible after drilling is completed.
6. For micropiles designed with a full length casing, the casing shall be pulled back to the top of the bond zone and reinserted or some other suitable means employed to assure grout coverage outside the casing.

~~1808.2.22~~ **1810.4.11 Special inspection.** ~~Special inspections in accordance with Sections 1704.8 and 1704.9 shall be provided for piles and piers driven and cast-in-place deep foundation elements, respectively.~~

~~1808.2.23.2~~ **Seismic Design Category D, E or F.** ~~Where a structure is assigned to Seismic Design Category D, E or F in accordance with Section 1613, the requirements for Seismic Design Category C given in Section 1808.2.23.1 shall be met, in addition to the following. Provisions of ACI 318, Section 21.10.4, shall apply when not in conflict with the provisions of Sections 1808 through 1812. Concrete shall have a specified compressive strength of not less than 3,000 psi (20.68 MPa) at 28 days.~~

Exceptions:

1. Group R or U occupancies of light-framed construction and two stories or less above grade plane are permitted to use concrete with a specified compressive strength of not less than 2,500 psi (17.2 MPa) at 28 days.

2. Detached one- and two-family dwellings of light-frame construction and two stories or less in height are not required to comply with the provisions of ACI 318, Section 21.10.4.
3. Section 21.10.4.4(a) of ACI 318 need not apply to concrete piles.

1809.2.3.1 Materials. ~~Prestress~~ steel shall conform to ASTM A 416. Concrete shall have a 28-day specified compressive strength (f'_c) of not less than 5,000 psi (34.48 MPa).

1810.5.4 Reinforcement. Reinforcement shall not be placed within 1 inch (25 mm) of the steel shell. ~~Reinforcing shall be required for unsupported pile lengths or where the pile is designed to resist uplift or unbalanced lateral loads.~~

1810.6.4 Reinforcement. ~~Reinforcement steel shall conform to Section 1810.1.2.~~ Reinforcement shall not be placed within 1 inch (25 mm) of the steel casing.

1810.7.2 Materials. ~~Pipe and steel cores shall conform to the material requirements in Section 1809.3. Pipes shall have a minimum wall thickness of 3/8 inch (9.5 mm) and shall be fitted with a suitable steel driving shoe welded to the bottom of the pipe.~~ Concrete shall have a 28-day specified compressive strength (f'_c) of not less than 4,000 psi (27.58 MPa). The concrete mix shall be designed and proportioned so as to produce a cohesive workable mix with a slump of 4 inches to 6 inches (102 mm to 152 mm).

2. Delete without substitution:

~~**1808.2.8 Allowable pier or pile loads.**~~

~~**1808.2.14 Installation sequence.** Piles shall be installed in such sequence as to avoid compacting the surrounding soil to the extent that other piles cannot be installed properly, and to prevent ground movements that are capable of damaging adjacent structures.~~

~~**1808.2.16 Pile driveability.** Pile cross sections shall be of sufficient size and strength to withstand driving stresses without damage to the pile, and to provide sufficient stiffness to transmit the required driving forces.~~

~~**1808.2.23 Seismic design of piers or piles.**~~

**SECTION 1809
DRIVEN PILE FOUNDATIONS**

~~**1809.1.4 Allowable stresses.** The allowable stresses shall be in accordance with the AF&PA NDS.~~

~~**1809.2 Precast concrete piles.**~~

~~**1809.2.1.4 Installation.** Piles shall be handled and driven so as not to cause injury or overstressing, which affects durability or strength.~~

~~**1809.2.2.1 Materials.** Concrete shall have a 28-day specified compressive strength (f'_c) of not less than 3,000 psi (20.68 MPa).~~

~~**1809.2.2.3 Allowable stresses.** The allowable compressive stress in the concrete shall not exceed 33 percent of the 28-day specified compressive strength (f'_c) applied to the gross cross-sectional area of the pile. The allowable compressive stress in the reinforcing steel shall not exceed 40 percent of the yield strength of the steel (f_y) or a maximum of 30,000 psi (207 MPa). The allowable tensile stress in the reinforcing steel shall not exceed 50 percent of the yield strength of the steel (f_y) or a maximum of 24,000 psi (165 MPa).~~

~~**1809.2.2.5 Concrete cover.** Reinforcement for piles that are not manufactured under plant conditions shall have a concrete cover of not less than 2 inches (51 mm).~~

~~Reinforcement for piles manufactured under plant control conditions shall have a concrete cover of not less than 1.25 inches (32 mm) for No. 5 bars and smaller, and not less than 1.5 inches (38 mm) for No. 6 through No. 11 bars except that longitudinal bars spaced less than 1.5 inches (38 mm) clear distance apart shall be considered bundled bars for which the minimum concrete cover shall be equal to that for the equivalent diameter of the bundled bars. Reinforcement for piles exposed to seawater shall have a concrete cover of not less than 3 inches (76 mm).~~

~~**1809.2.3.3 Allowable stresses.** The allowable design compressive stress, f_{e1} , in concrete shall be determined as follows:~~

$$f'_e = 0.33 f'_c - 0.27 f_{pe} \quad (\text{Equation 18-10})$$

where:

f'_c = The 28-day specified compressive strength of the concrete.

f_{pe} = The effective prestress stress on the gross section.

1809.2.3.4 Installation. A prestressed pile shall not be driven before the concrete has attained a compressive strength of at least 75 percent of the 28-day specified compressive strength (f'_c), but not less than the strength sufficient to withstand handling and driving forces.

1809.2.3.5 Concrete cover. Prestressing steel and pile reinforcement shall have a concrete cover of not less than 1-1/4 inches (32 mm) for square piles of 12 inches (305 mm) or smaller size and 1-1/2 inches (38 mm) for larger piles, except that for piles exposed to seawater, the minimum protective concrete cover shall not be less than 2-1/2 inches (64 mm).

1809.3 Structural steel piles. Structural steel piles shall conform to the requirements of Sections 1809.3.1 through 1809.3.4.

1809.3.2 Allowable stresses. The allowable axial stresses shall not exceed 35 percent of the minimum specified yield strength (F_y).

Exception: Where justified in accordance with Section 1808.2.10, the allowable axial stress is permitted to be increased above $0.35F_y$, but shall not exceed $0.5F_y$.

SECTION 1810 CAST-IN-PLACE CONCRETE PILE FOUNDATIONS

1810.1 General. The materials, reinforcement and installation of cast-in-place concrete piles shall conform to Sections 1810.1.1 through 1810.1.3.

1810.1.3 Concrete placement. Concrete shall be placed in such a manner as to ensure the exclusion of any foreign matter and to secure a full-sized shaft. Concrete shall not be placed through water except where a tremie or other approved method is used. When depositing concrete from the top of the pile, the concrete shall not be chuted directly into the pile but shall be poured in a rapid and continuous operation through a funnel hopper centered at the top of the pile.

1810.2 Enlarged base piles. Enlarged base piles shall conform to the requirements of Sections 1810.2.1 through 1810.2.5.

1810.2.2 Allowable stresses. The maximum allowable design compressive stress for concrete not placed in a permanent steel casing shall be 25 percent of the 28-day specified compressive strength (f'_c). Where the concrete is placed in a permanent steel casing, the maximum allowable concrete stress shall be 33 percent of the 28-day specified compressive strength (f'_c).

1810.2.4 Load-bearing capacity. Pile load-bearing capacity shall be verified by load tests in accordance with Section 1808.2.8.3.

1810.2.5 Concrete cover. The minimum concrete cover shall be 2-1/2 inches (64 mm) for uncased shafts and 1 inch (25 mm) for cased shafts.

1810.3 Drilled or augered uncased piles. Drilled or augered uncased piles shall conform to Sections 1810.3.1 through 1810.3.5.

1810.3.1 Allowable stresses. The allowable design stress in the concrete of drilled or augered uncased piles shall not exceed 33 percent of the 28-day specified compressive strength (f'_c). The allowable compressive stress of reinforcement shall not exceed 40 percent of the yield strength of the steel or 25,500 psi (175.8 MPa).

1810.3.5 Reinforcement in Seismic Design Category C, D, E or F. Where a structure is assigned to Seismic Design Category C, D, E or F in accordance with Section 1613, the corresponding requirements of Sections 1810.1.2.1 and 1810.1.2.2 shall be met.

~~1810.4 Driven uncased piles.~~ Driven uncased piles shall conform to Sections 1810.4.1 through 1810.4.4.

~~1810.4.1 Allowable stresses.~~ The allowable design stress in the concrete shall not exceed 25 percent of the 28-day specified compressive strength (f'_c) applied to a cross-sectional area not greater than the inside area of the drive casing or mandrel.

~~1810.4.2 Dimensions.~~ The pile length shall not exceed 30 times the average diameter. The minimum diameter shall be 12 inches (305 mm).

~~Exception:~~ The length of the pile is permitted to exceed 30 times the diameter, provided that the design and installation of the pile foundation is under the direct supervision of a registered design professional knowledgeable in the field of soil mechanics and pile foundations. The registered design professional shall certify to the building official that the piles were installed in compliance with the approved design.

~~1810.4.4 Concrete cover.~~ Pile reinforcement shall have a concrete cover of not less than 2.5 inches (64 mm), measured from the inside face of the drive casing or mandrel.

~~1810.5 Steel-cased piles.~~ Steel-cased piles shall comply with the requirements of Sections 1810.5.1 through 1810.5.4.

~~1810.6 Concrete-filled steel pipe and tube piles.~~ Concrete-filled steel pipe and tube piles shall conform to the requirements of Sections 1810.6.1 through 1810.6.5.

~~1810.6.1 Materials.~~ Steel pipe and tube sections used for piles shall conform to ASTM A 252 or ASTM A 283. Concrete shall conform to Section 1810.1.1. The maximum coarse aggregate size shall be 3/4 inch (19.1 mm).

~~1810.6.2 Allowable stresses.~~ The allowable design compressive stress in the concrete shall not exceed 33 percent of the 28-day specified compressive strength (f'_c). The allowable design compressive stress in the steel shall not exceed 35 percent of the minimum specified yield strength of the steel (F_y), provided F_y shall not be assumed greater than 36,000 psi (248 MPa) for computational purposes.

~~Exception:~~ Where justified in accordance with Section 1808.2.10, the allowable stresses are permitted to be increased to $0.50 F_y$.

~~1810.6.4.1 Seismic reinforcement.~~ Where a structure is assigned to Seismic Design Category C, D, E or F in accordance with Section 1613, the following shall apply. Minimum reinforcement no less than 0.01 times the cross-sectional area of the pile concrete shall be provided in the top of the pile with a length equal to two times the required cap embedment anchorage into the pile cap, but not less than the tension development length of the reinforcement. The wall thickness of the steel pipe shall not be less than 3/16 inch (5 mm).

~~1810.6.5 Placing concrete.~~ The placement of concrete shall conform to Section 1810.1.3, but is permitted to be chuted directly into smooth-sided pipes and tubes without a centering funnel hopper.

~~1810.7 Caisson piles.~~ Caisson piles shall conform to the requirements of Sections 1810.7.1 through 1810.7.6.

~~1810.7.5 Allowable stresses.~~ The allowable design compressive stresses shall not exceed the following: concrete, $0.33 f'_c$; steel pipe, $0.35 F_y$; and structural steel core, $0.50 F_y$.

~~1810.8.3 Allowable stresses.~~ The allowable compressive stress in the grout shall not exceed $0.33 f'_c$. The allowable compressive stress in the steel pipe and steel reinforcement shall not exceed the lesser of $0.4 F_y$ and 32,000 psi (220 Mpa). The allowable tensile stress in the steel reinforcement shall not exceed $0.60 F_y$. The allowable tensile stress in the cement grout shall be zero.

SECTION 1811 COMPOSITE PILES

~~1811.1 General.~~ Composite piles shall conform to the requirements of Sections 1811.2 through 1811.5.

~~1811.2 Design.~~ Composite piles consisting of two or more approved pile types shall be designed to meet the conditions of installation.

~~1811.3 Limitation of load.~~ The maximum allowable load shall be limited by the capacity of the weakest section incorporated in the pile.

~~1811.4 Splices.~~ Splices between concrete and steel or wood sections shall be designed to prevent separation both before and after the concrete portion has set, and to ensure the alignment and transmission of the total pile load. Splices shall be designed to resist uplift caused by upheaval during driving of adjacent piles, and shall develop the full compressive strength and not less than 50 percent of the tension and bending strength of the weaker section.

~~1811.5 Seismic reinforcement.~~ Where a structure is assigned to Seismic Design Category C, D, E or F in accordance with Section 1613, the following shall apply. Where concrete and steel are used as part of the pile assembly, the concrete reinforcement shall comply with that given in Sections 1810.1.2.1 and 1810.1.2.2 or the steel section shall comply with Section 1810.6.4.1.

SECTION 1812 PIER FOUNDATIONS

~~1812.1 General.~~ Isolated and multiple piers used as foundations shall conform to the requirements of Sections 1812.2 through 1812.10, as well as the applicable provisions of Section 1808.2.

~~1812.2 Lateral dimensions and height.~~ The minimum dimension of isolated piers used as foundations shall be 2 feet (610 mm), and the height shall not exceed 12 times the least horizontal dimension.

~~1812.3 Materials.~~ Concrete shall have a 28-day specified compressive strength (f'_c) of not less than 2,500 psi (17.24 MPa). Where concrete is placed through a funnel hopper at the top of the pier, the concrete mix shall be designed and proportioned so as to produce a cohesive workable mix having a slump of not less than 4 inches (102 mm) and not more than 6 inches (152 mm). Where concrete is to be pumped, the mix design including slump shall be adjusted to produce a pumpable concrete.

~~1812.5 Concrete placement.~~ Concrete shall be placed in such a manner as to ensure the exclusion of any foreign matter and to secure a full-sized shaft. Concrete shall not be placed through water except where a tremie or other approved method is used. When depositing concrete from the top of the pier, the concrete shall not be chuted directly into the pier but shall be poured in a rapid and continuous operation through a funnel hopper centered at the top of the pier.

~~1812.8 Concrete.~~ Where adequate lateral support is not provided, and the unsupported height to least lateral dimension does not exceed three, piers of plain concrete shall be designed and constructed as pilasters in accordance with ACI 318. Where the unsupported height to least lateral dimension exceeds three, piers shall be constructed of reinforced concrete, and shall conform to the requirements for columns in ACI 318.

Exception: Where adequate lateral support is furnished by the surrounding materials as defined in Section 1808.2.9, piers are permitted to be constructed of plain or reinforced concrete. The requirements of ACI 318 for bearing on concrete shall apply.

~~1812.9 Steel shell.~~ Where concrete piers are entirely encased with a circular steel shell, and the area of the shell steel is considered reinforcing steel, the steel shall be protected under the conditions specified in Section 1808.2.17. Horizontal joints in the shell shall be spliced to comply with Section 1808.2.7.

~~1812.10 Dewatering.~~ Where piers are carried to depths below water level, the piers shall be constructed by a method that will provide accurate preparation and inspection of the bottom, and the depositing or construction of sound concrete or other masonry in the dry.

Reason: Significant clarification, update, generalization, and simplification of the code requirements for deep foundations.

Reorganizes deep foundation requirements to eliminate repetition, fix conflicting definitions, and generalize and simplify requirements where possible. Most of the changes proposed are either purely editorial or nearly editorial. The substantive and nearly editorial changes are described herewith.

Definitions: The current definitions cause confusion and conflict. For instance, consider the definitions of "pier" and "pile". Some of the requirements for piers differ from those for piles, but the definitions only confuse matters. By the current definitions, piers must 1) be isolated, 2) be constructed of masonry or cast-in-place concrete, and 3) have a length of no more than 12 times the least horizontal dimension; piles must 1) be of concrete, wood, or steel either driven into the ground or cast in place, and 2) have a length exceeding 12 times the least horizontal dimension. As a result, foundation elements that have length less than 12 times the least horizontal dimension are **neither piers nor piles** if grouped or if constructed of wood, steel, or precast concrete. Several sections (such as 1808.2.5 and 1808.2.9.3) assume that piers are isolated, as the definition requires; Section 1812.1 addresses "isolated and multiple piers", which conflicts with the definition. The solution is, not to revise or add definitions but, to generalize and unify the requirements to the extent possible and then describe specific conditions of concern while

specifying the related requirements. In order to unify, generalize, and simplify the requirements, some minor substantive changes are produced. Where the substantive change is small but the improvement in clarity and consistency of application is great, such revisions aid the registered design professional, the building official, and the public. This change proposal groups all deep foundation systems together (by defining shallow foundations) and sets forth general rules for the analysis, design, detailing, and installation of deep foundations. Specific deep foundation types are defined only where the rules for that type are so many and so peculiar that providing verbal descriptions for scoping would become unmanageable.

The exceptions that appeared in Section 1808.2.1 are embodied in the overall revisions to the requirements for deep foundations.

In a related proposal the numbered list in Section 1810.1.1 is moved to the section for geotechnical investigations.

New Section 1810.1.3 is based on current requirements. Concrete elements with height no greater than three times the least horizontal dimension are pedestals (not pilasters) per ACI 318. The exception in current Section 1812.8 is not really an exception, as it describes a different case than that addressed in the text (laterally supported versus unsupported). The intent of that exception is carried forward in the proposed text since it permits use of unreinforced sections where lateral support is provided, moment demands are less than the design cracking moment, and seismic concerns do not govern.

Since one of the conditions of concern in Section 1810.2.1 is “fluid soils”, the revised text makes clear that the embedment required is the distance into either stiff soil or soft soil (not the distance below the ground surface). Although the terms “stiff soil” and “soft soil” are, strictly speaking, not (and never have been) defined in this code as related to this provision, they are in general agreement with the terms used in site classification (Section 1613.5.2, Site Classes D and E, respectively).

In new Section 1810.2.2 the first exception addresses a prime condition of what were previously termed “piers”—that is, permission to use isolated elements without additional lateral bracing.

New Sections 1810.2.4 and 1810.2.5 generalize requirements that were previously required for deep foundations of structures assigned to Seismic Design Category C, D, E, or F. This generalization is consistent with current practice and the recommendations of every published standard for deep foundations. Compliance is possible using traditional tables, formulas, or charts or using analysis methods that have been commonly employed for several decades.

New Section 1810.3.1.1 formalizes current practice as implied by the present text of Chapter 18 and as explicitly stated in other documents. The concrete design methods commonly employed no longer recognize allowable stress or working stress design. For many decades structural concrete design has employed the strength design method. However, there is a long tradition of using simple allowable stress design approaches for the proportioning of deep foundation elements (for both soil-foundation behavior and structural design). The proposed text is consistent with the design approaches specified in ACI 543 (Design, Manufacture, and Installation of Concrete Piles). Section 2.3 of that document reads (in part) as follows:

“Whereas axial compression may often be the primary mode of loading, concrete piles are also frequently subjected to axial tension, bending, and shear loadings as well as various combinations of loading, as noted in Section 2.2. Concrete piles must have adequate structural capacity for all modes and combinations of loading that they will experience. For combined flexure and thrust loadings, the structural adequacy can be evaluated more readily through the use of moment-thrust interaction diagrams and strength-design methods.

... Because of the historical use of allowable capacities and stresses in piling design, however, recommendations are also provided for allowable axial service capacities for concentrically loaded, laterally supported piles. The allowable service capacities P_a recommended in Section 2.3.3 are intended specifically for cases in which the soil provides full lateral support to the pile and where the applied forces cause no more than minor bending moments resulting from accidental eccentricities. Piles subjected to larger bending moments or with unsupported lengths must be treated as columns in accordance with ACI 318-95 and the provisions given in Sections 2.3.2, 2.3.4, and 2.3.5 of this report.”

Rather than treating composite elements in a different section, this proposal generalizes the requirement that each component of the composite element must comply with the applicable provisions of the code.

The proposed text uses the term “casing” in a manner consistent with current practice and use of the terms as defined in ACI 336.1 (Specification for the Construction of Drilled Piers). The term “casing” is appropriate where the element in question resists earth and water pressures. The term “liner” (which does not appear in this proposed text) applies where the element in question resists internal concrete pressures, but is “not designed for external earth and water pressures.” Chapter 18 of the IBC does not venture so far into construction methods as to address liners. The only prior occurrences of “liner” (Section 1810.3.3) are related to “hydrostatic and lateral soil pressure,” for which the term “casing” is more appropriate. Where the current text of Chapter 18 uses “shell” interchangeably with “casing”, this proposal uses “casing” consistently.

The proposed treatment of timber deep foundation elements is more consistent both internally and with respect to the reference codes and standards. The present definition of “timber pile,” which requires that the element be round and be placed tip first conflicts with the text that addresses sawn timber piles, which are square, and the reference standard (AF&PA NDS), which permits use of piles (tip first) or poles (butt first). New Section 1810.3.2.4 acknowledges use of both piles and poles.

Allowable stresses: The treatment of allowable stresses in this proposal is simple, clear, consistent, and even-handed as applied to deep foundation elements of different types. In generalizing and treating consistently, minor substantive changes result. The table below compares the allowable stresses specified in ACI 543, the 2006 IBC, and this proposal. For most types this proposal represents no change from the 2006 IBC. However, a few cases have changes of up to about 10 percent (which, practically speaking, is negligible). In the 2006 IBC, driven uncased piles and drilled or augered uncased piles have considerably different allowable stresses. This proposal splits the difference and is generally consistent with ACI 543. The real strength of the proposed approach is that it can be applied to other types of deep foundations without conflict, confusion, or question. Where the present text of Section 1808.2.3 is applied to “special types of piles” it is unclear which of the ten sets of allowable stresses should not be exceeded. Using the proposed text, which generalizes the treatment of allowable stresses, such questions have a ready, defensible answer.

Element type	ACI 543	2006 IBC	This proposal
Precast prestressed concrete piles	$0.33 f'_c - 0.27 f_{pc}$	$0.33 f'_c - 0.27 f_{pc}$	$0.33 f'_c - 0.27 f_{pc}$
Precast nonprestressed concrete piles	$0.33 f'_c$ $0.39 f_y$	$0.33 f'_c$ $0.4 f_y \leq 30,000 \text{ psi}$	$0.33 f'_c$ $0.4 f_y \leq 30,000 \text{ psi}$
Cast-in-place, uncased, plain	$0.29 f'_c$	$0.25 f'_c$	$0.3 f'_c$
Cast-in-place, uncased, reinforced DRIVEN	$0.28 f'_c$ $0.33 f_y$	$0.25 f'_c$	$0.3 f'_c$ $0.4 f_y \leq 30,000 \text{ psi}$
Cast-in-place, uncased, reinforced DRILLED or AUGERED	$0.28 f'_c$ $0.33 f_y$	$0.33 f'_c$ $0.4 f_y \leq 25,500 \text{ psi}$	$0.3 f'_c$ $0.4 f_y \leq 30,000 \text{ psi}$
Cast-in-place, cased	$0.32 f'_c$	$0.33 f'_c$	$0.33 f'_c$

Element type	ACI 543	2006 IBC	This proposal
Cast-in-place, special casing	$0.26(f'_c + 8.2t_s f_y/D)$ $\leq 0.4 f'_c$	$0.4 f'_c$	$0.4 f'_c$
Cast-in-place, structural steel pipe or tube	$0.37 f'_c$ $0.43 f_{yp}$	$0.33 f'_c$ $0.35 F_y \leq 12,600$ psi up to $0.5 F_y$	$0.33 f'_c$ $0.35 F_y \leq 16,000$ psi up to $0.5 F_y \leq 32,000$ psi
Caisson (socketed drilled shaft)	$0.37 f'_c$ $0.43 f_{yp}$	$0.33 f'_c$ $0.35 F_y$ (pipe or tube) $0.5 F_y$ (core)	$0.33 f'_c$ $0.35 F_y \leq 16,000$ psi up to $0.5 F_y \leq 32,000$ psi $0.5 F_y$ (core)
Structural steel elements	---	$0.35 F_y$ up to $0.5 F_y$	$0.35 F_y \leq 16,000$ psi up to $0.5 F_y \leq 32,000$ psi
Micropiles	---	$0.33 f'_c$ $0.4 f_y \leq 32,000$ psi $0.4 F_y \leq 32,000$ psi $0.6 f_y$ Tension	$0.33 f'_c$ $0.4 f_y \leq 30,000$ psi $0.4 F_y \leq 32,000$ psi $0.6 f_y$ Tension
Timber	---	In accordance with the AF&PA NDS	In accordance with the AF&PA NDS

The first requirement of new Section 1810.3.2.7 is consistent with current practice and the requirements of ACI 543 Table 2.2. The second requirement is moved from Section 1810.5.1; it is the sealed tip that produces a displacement pile with increased capacity.

In new Section 1810.3.3.1.2 the requirement for load testing of cast-in-place deep foundation elements with an enlarged base previously appeared in Section 1810.2.4.

For improved clarity of application and consistency with ASCE 7-05, seismic requirements are rewritten to avoid "cascading," which often led to confusion concerning scope. For instance, new Section 1810.3.8.2.2 applies to Seismic Design Categories C through F and new Section 1810.3.8.2.3 provides "additional" requirements for Seismic Design Categories D through F; in both cases the scope is clearly defined. In another instance it was possible to separate the requirements; Section 1810.3.8.3.2 applies to Seismic Design Category C and Section 1810.3.8.3.3 (with revised Equation 18-6) applies to Seismic Design Categories D through F.

The change at the end of new Section 1810.3.8.2.2 is editorial although it may not appear so. First, the 8 inch maximum spacing is changed to 6 inches since new Section 1810.3.8.1 specifies a maximum spacing of 6 inches for non-seismic cases. Then, the spacing of 16 longitudinal bar diameters can be eliminated since 16 times the smallest bar diameter (3/8") is no more stringent.

The change in new Section 1810.3.8.3.2 is editorial since Equation 18-4 produces a value greater than 0.007 where the minimum value of f'_c (5 ksi) is used with the maximum value of f_{yh} (85 ksi).

The revision to Equation 18-6 eliminates cascading requirements from the section above.

New Sections 1810.3.9.1 and 1810.3.9.1 clarify the present requirements, agree with the requirements of ACI 318-08, and allow elimination of the definition for flexural length. For both uncased and cased cast-in-place deep foundation elements (but not concrete filled pipes and tubes) reinforcement must be provided where moments exceed a reasonable lower bound for the capacity of the plain concrete section. In several sections of the 2006 IBC (and other related documents) that design cracking moment is taken as 0.4 times the "concrete section cracking moment strength." Section 9.5.2.3 of ACI 318 defines the cracking moment strength as 7.5 times the square root of f'_c times the elastic section modulus of the gross section ($0.4 \times 7.5 = 3$). Using Chapter 22 of ACI 318-08, one would take $\phi M_n = 0.6$ times 5.0 times the square root of f'_c times the elastic section modulus of the gross section ($0.6 \times 5.0 = 3$). The proposed text is consistent with the current requirement and paves the way for use of a reference standard in the future. The proposed sections are also used in place of the less clear phrase "not rupture" in Exception 3 of new

Section 1810.3.9.4. Editorial note: Where metric units are used, Equation 18-10 should be shown as $\phi M_n = 0.25 \sqrt{f'_c} S_m$.

The proposed revisions in new Section 1810.3.10.1 clarifies the intent to permit the pipe or tube casing to terminate above the bond zone, with deformed bar reinforcement continuing below. It also specifies a splice condition for that transition.

In new Section 1810.3.10.4 "120 percent of the flexural length" is changed to "the point of zero curvature" for two reasons. First, with the revisions related to design cracking moment, this is the only section that uses the current definition of flexural length (first point of zero lateral deflection). Second, the distance to the point of zero curvature, which is also used in new Section 1810.3.8.3.3, is approximately equal to 120 percent of the distance to the point of zero deflection.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Errata: Replace the entire proposal with the following:

Revise as follows:

SECTION ~~4808~~ 1802 PIER AND PILE DEFINITIONS

~~4808.4~~ **1802.1 Definitions.** The following words and terms shall, for the purposes of this ~~section~~ chapter, have the meanings shown herein.

DEEP FOUNDATION. A deep foundation is a foundation element that does not satisfy the definition of a shallow foundation.

DRILLED SHAFT. A drilled shaft is a cast-in-place deep foundation element constructed by drilling a hole (with or without permanent casing) into soil or rock and filling it with fluid concrete.

Socketed drilled shaft A socketed drilled shaft is a drilled shaft with a permanent pipe or tube casing that extends down to bedrock and an uncased socket drilled into the bedrock

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MICROPILES. Micropiles are 12-inch (305 mm) diameter or less; A micropile is a bored, grouted-in-place piles incorporating steel pipe (casing) and/or steel reinforcement deep foundation element that develops its load-carrying capacity by means of a bond zone in soil, bedrock, or a combination of soil and bedrock.

SHALLOW FOUNDATION. A shallow foundation is an individual or strip footing, a mat foundation, a slab on grade foundation, or a similar foundation element.

FLEXURAL LENGTH. Flexural length is the length of the pile from the first point of zero lateral deflection to the underside of the pile cap or grade beam.

PIER FOUNDATIONS. Pier foundations consist of isolated masonry or cast-in-place concrete structural elements extending into firm materials. Piers are relatively short in comparison to their width, with lengths less than or equal to 12 times the least horizontal dimension of the pier. Piers derive their load-carrying capacity through skin friction, through end bearing, or a combination of both.

Belled piers. Belled piers are cast-in-place concrete piers constructed with a base that is larger than the diameter of the remainder of the pier. The belled base is designed to increase the load-bearing area of the pier in end bearing.

PILE FOUNDATIONS. Pile foundations consist of concrete, wood or steel structural elements either driven into the ground or cast in place. Piles are relatively slender in comparison to their length, with lengths exceeding 12 times the least horizontal dimension. Piles derive their load-carrying capacity through skin friction, through end bearing, or a combination of both.

Augered uncased piles. Augered uncased piles are constructed by depositing concrete into an uncased augered hole, either during or after the withdrawal of the auger.

Caisson piles. Caisson piles are cast-in-place concrete piles extending into bedrock. The upper portion of a caisson pile consists of a cased pile that extends to the bedrock. The lower portion of the caisson pile consists of an uncased socket drilled into the bedrock.

Concrete-filled steel pipe and tube piles. Concrete-filled steel pipe and tube piles are constructed by driving a steel pipe or tube section into the soil and filling the pipe or tube section with concrete. The steel pipe or tube section is left in place during and after the deposition of the concrete.

Driven uncased piles. Driven uncased piles are constructed by driving a steel shell into the soil to shore an unexcavated hole that is later filled with concrete. The steel casing is lifted out of the hole during the deposition of the concrete.

Enlarged base piles. Enlarged base piles are cast-in-place concrete piles constructed with a base that is larger than the diameter of the remainder of the pile. The enlarged base is designed to increase the load-bearing area of the pile in end bearing.

Steel-cased piles. Steel-cased piles are constructed by driving a steel shell into the soil to shore an unexcavated hole. The steel casing is left permanently in place and filled with concrete.

Timber piles. Timber piles are round, tapered timbers with small (tip) end embedded into the soil.

SECTION 1810 DEEP FOUNDATIONS

1808.2 Piers and piles—general requirements.

1808.2.1 Design. Piles are permitted to be designed in accordance with provisions for piers in Section 1808 and Sections 1812.3 through 1812.10 where either of the following conditions exists, subject to the approval of the building official:

1. Group R-3 and U occupancies not exceeding two stories of light frame construction, or
2. Where the surrounding foundation materials furnish adequate lateral support for the pile.

1810.1 General. Deep foundations shall be analyzed, designed, detailed, and installed in accordance with Sections 1810.1 through 1810.4.

1808.2.2 1810.1.1 General Geotechnical investigation. Pier and pile Deep foundations shall be designed and installed on the basis of a foundation investigation as defined in Section 1802, unless sufficient data upon which to base the design and installation is available. The investigation and report provisions of Section 1802 shall be expanded to include, but not be limited to, the following:

1. Recommended pier or pile types and installed capacities.
2. Recommended center-to-center spacing of piers or piles.
3. Driving criteria.
4. Installation procedures.
5. Field inspection and reporting procedures (to include procedures for verification of the installed bearing capacity where required).
6. Pier or pile load test requirements.
7. Durability of pier or pile materials.
8. Designation of bearing stratum or strata.
9. Reductions for group action, where necessary.

1808.2.4 1810.1.2 Use of existing piers or piles deep foundation elements. Piers or piles Deep foundation elements left in place where a structure has been demolished shall not be used for the support of new construction unless satisfactory evidence is submitted to the building official, which indicates that the piers or piles elements are sound and meet the requirements of this code. Such piers or piles elements shall be load tested or redriven to verify their capacities. The design load applied to such piers or piles elements shall be the lowest allowable load as determined by tests or redriving data.

1810.1.3 Deep foundation elements classified as columns. Deep foundation elements standing unbraced in air, water, or fluid soils shall be classified as columns and designed as such in accordance with the provisions of this code from their top down to the point where adequate lateral support is provided in accordance with Section 1810.2.1.

Exception: Where the unsupported height to least horizontal dimension of a cast-in-place deep foundation element does not exceed three, it shall be permitted to design and construct such an element as a pedestal in accordance with ACI 318.

1808.2.3 1810.1.4 Special types of piles deep foundations. The use of types of piles deep foundation elements not specifically mentioned herein is permitted, subject to the approval of the building official, upon the submission of acceptable test data, calculations and other information relating to the structural properties and load capacity of such piles elements. The allowable stresses for materials shall not in any case exceed the limitations specified herein.

1808.2.9 Lateral support.

1810.2 Analysis. The analysis of deep foundations for design shall be in accordance with Sections 1810.2.1 through 1810.2.5.

1808.2.9.1 1810.2.1 General Lateral support. Any soil other than fluid soil shall be deemed to afford sufficient lateral support to the pier or pile to prevent buckling of deep foundation elements and to permit the design of the pier or pile elements in accordance with accepted engineering practice and the applicable provisions of this code.

1808.2.9.2 Unbraced piles. Piles standing Where deep foundation elements stand unbraced in air, water, or in fluid soils, it shall be designed as columns in accordance with the provisions of this code. Such piles driven into firm ground can be considered permitted to consider them fixed and laterally supported at a point 5 feet (1524 mm) below the ground surface and in soft material at into stiff soil or 10 feet (3048 mm) below the ground surface into soft soil unless otherwise prescribed by the building official after a foundation investigation by an approved agency.

1808.2.5 1810.2.2 Stability. Piers or piles Deep foundation elements shall be braced to provide lateral stability in all directions. Three or more piles elements connected by a rigid cap shall be considered braced, provided that the piles elements are located in radial directions from the centroid of the group not less than 60 degrees (1 rad) apart. A two-pile two-element group in a rigid cap shall be considered to be braced along the axis connecting the two piles elements. Methods used to brace piers or piles deep foundation elements shall be subject to the approval of the building official.

Piles Deep foundation elements supporting walls shall be driven placed alternately in lines spaced at least 1 foot (305 mm) apart and located symmetrically under the center of gravity of the wall load carried, unless effective measures are taken to provide for eccentricity and lateral forces, or the wall piles foundation elements are adequately braced to provide for lateral stability. A single row of piles without lateral bracing is permitted for one- and two-family dwellings and lightweight construction not exceeding two stories above grade plane or 35 feet (10 668 mm) in building height, provided the centers of the piles are located within the width of the foundation wall.

Exceptions:

1. Isolated cast-in-place deep foundation elements without lateral bracing shall be permitted where the least horizontal dimension is no less than 2 feet (610 mm), adequate lateral support in accordance with Section 1810.2.1 is provided for the entire height and the height does not exceed 12 times the least horizontal dimension.
2. A single row of deep foundation elements without lateral bracing is permitted for one- and two-family dwellings and lightweight construction not exceeding two stories above grade plane or 35 feet (10 668 mm) in building height, provided the centers of the elements are located within the width of the supported wall.

1808.2.12 1810.2.3 Settlement analysis. The settlement of piers, individual piles or groups of piles a single deep foundation element or group thereof shall be estimated based on approved methods of analysis. The predicted settlement shall cause neither harmful distortion of, nor instability in, the structure, nor cause any stresses to exceed allowable values.

1808.2.23.1.2 1810.2.4 Design details Lateral loads. Pier or pile The moments, shears and lateral deflections used for design of deep foundation elements shall be established considering the nonlinear interaction of the shaft and soil, as recommended determined by a registered design professional. Where the ratio of the depth of embedment of the pile to pile diameter or width element to its least horizontal dimension is less than or equal to six, the pile may be assumed to be it shall be permitted to assume the element is rigid.

Pile group effects from soil on lateral pile nominal strength shall be included where pile center to center spacing in the direction of lateral force is less than eight pile diameters. Pile group effects on vertical nominal strength shall be included where pile center to center spacing is less than three pile diameters. The pile uplift soil nominal strength shall be taken as the pile uplift strength as limited by the frictional force developed between the soil and the pile.

Where a minimum length for reinforcement or the extent of closely spaced confinement reinforcement is specified at the top of the pier or pile, provisions shall be made so that these specified lengths or extents are maintained after pier or pile cutoff.

1808.2.23.2.1 1810.2.4.1 Design details for piers, piles and grade beams Seismic Design Categories D through F. Piers or piles For structures assigned to Seismic Design Category D, E, or F, deep foundation elements on Site Class E or F sites, as determined in Section 1613.5.2, shall be designed and constructed to withstand maximum imposed curvatures from earthquake ground motions and structure response. Curvatures shall include free-field soil strains modified for soil-pile foundation-structure interaction coupled with pier or pile foundation element deformations induced by lateral pier or pile resistance to structure seismic forces associated with earthquake loads imparted to the foundation by the structure.

Exception: Piers or piles Deep foundation elements that satisfy the following additional detailing requirements shall be deemed to comply with the curvature capacity requirements of this section.

1. Precast prestressed concrete piles detailed in accordance with Section 1808.2.3.2.2 1810.3.8.3.3.
2. Cast-in-place concrete piles deep foundation elements with a minimum longitudinal reinforcement ratio of 0.005 extending the full length of the pile element and detailed in accordance with Sections 21.4.4.1, 21.4.4.2 and 21.4.4.3 of ACI 318 as required by this Section 1810.3.9.4.2.2.

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~~Where constructed of nonprestressed concrete such piers or piles shall be designed and detailed in accordance with Sections 21.4.4.1, 21.4.4.2 and 21.4.4.3 of ACI 318 within seven pile diameters of the pile cap and within seven pile diameters of the interfaces of strata that are hard or stiff and strata that are liquefiable or are composed of soft to medium stiff clay.~~

~~Grade beams shall comply with the provisions in Section 21.10.3 of ACI 318 for grade beams, except where they have the capacity to resist the forces from the load combinations in Section 1605.4.~~

1810.2.5 Group effects. The analysis shall include group effects on lateral behavior where the center-to-center spacing of deep foundation elements in the direction of lateral force is less than eight times the least horizontal dimension of an element. The analysis shall include group effects on axial behavior where the center-to-center spacing of deep foundation elements is less than three times the least horizontal dimension of an element.

1810.3 Design and Detailing. Deep foundations shall be designed and detailed in accordance with Sections 1810.3.1 through 1810.3.12.

1810.3.1 Design conditions. Design of deep foundations shall include the design conditions specified in Sections 1810.3.1.1 through 1810.3.1.5, as applicable.

1810.3.1.1 Design methods for concrete elements. Where concrete deep foundations are laterally supported in accordance with Section 1810.2.1 for the entire height and applied forces cause bending moments no greater than those resulting from accidental eccentricities, structural design of the element using the load combinations of Section 1605.3 and the allowable stresses specified in this chapter shall be permitted. Otherwise, the structural design of concrete deep foundation elements shall use the load combinations of Section 1605.2 and approved strength design methods.

1810.3.1.2 Composite elements. Where a single deep foundation element comprises two or more sections of different materials or different types spliced together, each section of the composite assembly shall satisfy the applicable requirements of this code, and the maximum allowable load shall be limited by the capacity of the weakest section.

~~1808.2.8.8~~ **1810.3.1.3 Overloads on piers or piles Mislocation.** ~~The maximum compressive load on any pier or pile due to mislocation shall not exceed To resist the effects of mislocation, compressive overload of deep foundation elements to 110 percent of the allowable design load shall be permitted.~~

~~1809.2.1.4~~ **1810.3.1.4 Design and manufacture Driven piles.** Driven piles shall be designed and manufactured in accordance with accepted engineering practice to resist all stresses induced by handling, driving and service loads.

~~1840.5.4~~ **1810.3.1.5 Materials Casings.** Pile shells or Temporary and permanent casings shall be of steel and shall be sufficiently strong to resist collapse and sufficiently water tight to exclude any foreign materials during the placing of concrete. ~~Steel shells shall have a sealed tip with a diameter of not less than 8 inches (203 mm).~~ Where a permanent casing is considered reinforcing steel, the steel shall be protected under the conditions specified in Section 1810.3.2.5. Horizontal joints in the casing shall be spliced in accordance with Section 1810.3.6.

1810.3.2 Materials. The materials used in deep foundations elements shall satisfy the requirements of Sections 1810.3.2.1 through 1810.3.2.8, as applicable.

~~1840.2.4~~ **1810.3.2.1 Materials Concrete.** Where concrete is cast in a steel pipe or where an enlarged base is formed by compacting concrete, the maximum size for coarse aggregate for concrete shall be 3/4 inch (19.1 mm). Concrete to be compacted shall have a zero slump.

1810.3.2.1.1 Seismic hooks. For structures assigned to Seismic Design Category C, D, E, or F in accordance with Section 1613, the ends of hoops, spirals and ties used in concrete deep foundation elements shall be terminated with seismic hooks, as defined in Section 21.1 of ACI 318, and shall be turned into the confined concrete core.

1810.3.2.2 Prestressing steel. Prestressing steel shall conform to ASTM A 416.

~~1809.3.4~~ **1810.3.2.3 Materials Structural steel.** Structural steel piles, steel pipe and fully welded steel piles fabricated from plates shall conform to ASTM A 36, ASTM A 252, ASTM A 283, ASTM A 572, ASTM A 588, ASTM A 690, ASTM A 913 or ASTM A 992.

~~1809.4~~ **1810.3.2.4 Timber piles.** Timber piles deep foundation elements shall be designed as piles or poles in accordance with the AF&PA NDS.

~~1809.1.1~~ **Materials.** Round timber piles elements shall conform to ASTM D 25. Sawn timber piles elements shall conform to DOC PS-20.

~~1809.1.2~~ **1810.3.2.4.1 Preservative treatment.** Timber piles deep foundation elements used to support permanent structures shall be treated in accordance with this section unless it is established that the tops of the untreated timber piles elements will be below the lowest ground-water level assumed to exist during the life of the structure. Preservative and minimum final retention shall be in accordance with AWPA U1 (Commodity Specification E, Use Category 4C) for round timber piles elements and AWPA U1 (Commodity Specification A, Use Category 4B) for sawn timber piles elements. Preservative-treated timber piles elements shall be subject to a quality control program administered by an approved agency. Pile Element cutoffs shall be treated in accordance with AWPA M4.

~~1808.2.4.7~~ **1810.3.2.5 Protection of pile materials.** Where boring records or site conditions indicate possible deleterious action on pier or pile the materials used in deep foundation elements because of soil constituents, changing water levels or other factors, the pier or pile materials elements shall be adequately protected by materials, methods or processes approved by the building official. Protective materials shall be applied to the piles elements so as not to be rendered ineffective by driving installation. The effectiveness of such protective measures for the particular purpose shall have been thoroughly established by satisfactory service records or other evidence.

1810.3.2.6 Allowable stresses. The allowable stresses for materials used in deep foundation elements shall not exceed those specified in Table 1810.3.2.6.

**TABLE 1810.3.2.6
ALLOWABLE STRESSES FOR MATERIALS USED IN DEEP FOUNDATION ELEMENTS**

MATERIAL TYPE AND CONDITION	MAXIMUM ALLOWABLE STRESS^a
1. Concrete or grout in compression ^b <u>Cast-in-place with a permanent casing in accordance with Section 1810.3.2.7</u> <u>Cast-in-place in a pipe, tube, or other permanent casing</u> <u>Cast-in-place without a permanent casing</u> <u>Precast nonprestressed</u> <u>Precast prestressed</u>	$0.4 f'_c$ $0.33 f'_c$ $0.3 f'_c$ $0.33 f'_c$ $0.33 f'_c - 0.27 f_{pc}$
2. Nonprestressed reinforcement in compression	$0.4 f_y \leq 30,000$ psi
3. Structural steel in compression <u>Cores within concrete-filled pipes or tubes</u> <u>Pipes, tubes, or H-piles, where justified in accordance with Section 1810.3.2.8</u> <u>Pipes or tubes for micropiles</u> <u>Other pipes, tubes, or H-piles</u>	$0.5 F_y \leq 32,000$ psi $0.5 F_y \leq 32,000$ psi $0.4 F_y \leq 32,000$ psi $0.35 F_y \leq 16,000$ psi
5. Nonprestressed reinforcement in tension <u>Within micropiles</u> <u>Other conditions</u>	$0.6 f_y$ $0.5 f_y \leq 24,000$ psi
6. Structural steel in tension <u>Pipes, tubes, or H-piles, where justified in accordance with Section 1810.3.2.8</u> <u>Other pipes, tubes, or H-piles</u>	$0.5 F_y \leq 32,000$ psi $0.35 F_y \leq 16,000$ psi
7. Timber	In accordance with the AF&PA NDS

- a. f'_c is the specified compressive strength of the concrete or grout; f_{pc} is the compressive stress on the gross concrete section due to effective prestress forces only; f_y is the specified yield strength of reinforcement; F_y is the specified minimum yield stress of structural steel.
- b. The stresses specified apply to the gross cross-sectional area within the concrete surface. Where a temporary or permanent casing is used, the inside face of the casing shall be considered the concrete surface.

1810.5.2 1810.3.2.7 Allowable stresses increased allowable compressive stress for cased cast-in-place elements. The allowable design compressive stress in the concrete shall not exceed 33 percent of the 28-day specified compressive strength (f'_c). The allowable concrete compressive stress shall be $0.40 (f'_c)$ for that portion of the pile meeting the conditions specified in Sections 1810.5.2.1 through 1810.5.2.4. shall be permitted to be increased as specified in Table 1810.3.2.6 for those portions of permanently cased cast-in-place elements that satisfy the following conditions:

- The design shall not use the casing to resist any portion of the axial load imposed.
- The casing shall have a sealed tip and be mandrel driven.
- 1810.5.2.1 Shell thickness.** The thickness of the steel shell casing shall not be less than manufacturer's standard gage No. 14 gage (0.068 inch) (1.75 mm) minimum.
- 1810.5.2.2 Shell type.** The shell casing shall be seamless or provided with seams of strength equal to the basic material and be of a configuration that will provide confinement to the cast-in-place concrete.
- 1810.5.2.3 Strength.** The ratio of steel yield strength (F_y) to 28-day specified compressive strength (f'_c) shall not be less than six.
- 1810.5.2.4 Diameter.** The nominal pile diameter of the element shall not be greater than 16 inches (406 mm).

1808.2.40 1810.3.2.8 Use Justification of higher allowable pier or pile stresses. Use of allowable stresses greater than those specified for piers or for each pile type in Sections 1809 and 1810 are in Section 1810.3.2.6 shall be permitted where supporting data justifying such higher stresses is filed with the building official. Such substantiating data shall include:

- A soils investigation in accordance with Section 1802.; and
- Pier or pile Load tests in accordance with Section ~~1808.2.8.3~~ 1810.3.3.1.2, regardless of the load supported by the pier or pile element.

The design and installation of the pier or pile deep foundation elements shall be under the direct supervision of a registered design professional knowledgeable in the field of soil mechanics and pier or pile deep foundations who shall certify to the building official that the piers or piles elements as installed satisfy the design criteria.

1808.2.8.4 1810.3.3 Determination of allowable loads. The allowable axial and lateral loads on piers or piles deep foundation elements shall be determined by an approved formula, load tests or method of analysis.

1810.3.3.1 Allowable axial load. The allowable axial load on a deep foundation element shall be determined in accordance with Section 1810.3.3.1.

1808.2.8.2 1810.3.3.1.1 Driving criteria. The allowable compressive load on any pile driven deep foundation element where determined by the application of an approved driving formula shall not exceed 40 tons (356 kN). For allowable loads above 40 tons (356 kN), the wave equation method of analysis shall be used to estimate pile driveability of for both driving stresses and net displacement per blow at the ultimate load. Allowable loads shall be verified by load tests in accordance with Section ~~1808.2.8.3~~ 1810.3.3.1.2. The formula or wave equation load shall be determined for gravity-drop or power-actuated hammers and the hammer energy used shall be the maximum consistent with the size, strength and weight of the driven piles elements. The use of a follower is permitted only with the approval of the building official. The introduction of fresh hammer cushion or pile cushion material just prior to final penetration is not permitted.

1808.2.8.3 1810.3.3.1.2 Load tests. Where design compressive loads per pier or pile are greater than those permitted by Section 1808.2.40 or determined using the allowable stresses specified in Section 1810.3.2.6 where the design load for any pier or pile deep foundation element is in doubt, or where cast-in-place deep foundation elements have an enlarged base formed either by compacting concrete or by driving a precast base, control test piers or piles elements shall be tested in accordance with ASTM D 1143 or ASTM D 4945. At least one pier or pile element shall

be ~~test loaded~~ load tested in each area of uniform subsoil conditions. Where required by the building official, additional ~~piers or piles~~ piles elements shall be load tested where necessary to establish the safe design capacity. The resulting allowable loads shall not be more than one-half of the ultimate axial load capacity of the test ~~pier or pile~~ element as assessed by one of the published methods listed in Section ~~4808.2.8.3.4~~ 1810.3.3.1.3 with consideration for the test type, duration and subsoil. The ultimate axial load capacity shall be determined by a registered design professional with consideration given to tolerable total and differential settlements at design load in accordance with Section ~~4808.2.4.2~~ 1810.2.3. In subsequent installation of the balance of ~~deep~~ foundation piles elements, all ~~piles elements~~ piles elements shall be deemed to have a supporting capacity equal to that of the control pile element where such ~~piles elements~~ piles elements are of the same type, size and relative length as the test ~~pile element~~ element; are installed using the same or comparable methods and equipment as the test ~~pile element~~ element; are installed in similar subsoil conditions as the test ~~pile element~~ element; and, for driven ~~piles elements~~ piles elements, where the rate of penetration (e.g., net displacement per blow) of such ~~piles elements~~ piles elements is equal to or less than that of the test ~~pile element~~ element driven with the same hammer through a comparable driving distance.

~~4808.2.8.3.4~~ 1810.3.3.1.3 **Load test evaluation methods.** It shall be permitted to evaluate ~~pile~~ pile load tests ~~with~~ of deep foundation elements using any of the following methods:

1. Davisson Offset Limit.
2. Brinch-Hansen 90% Criterion.
3. Butler-Hoy Criterion.
4. Other methods approved by the building official.

~~4808.2.8.4~~ 1810.3.3.1.4 **Allowable frictional resistance.** The assumed frictional resistance developed by any ~~pier or~~ uncased cast-in-place pile ~~deep foundation element~~ shall not exceed one-sixth of the bearing value of the soil material at minimum depth as set forth in Table 1804.2, up to a maximum of 500 psf (24 kPa), unless a greater value is allowed by the building official ~~after~~ on the basis of a soil investigation as specified in Section 1802 is submitted or a greater value is substantiated by a load test in accordance with Section ~~4808.2.8.3~~ 1810.3.3.1.2. Frictional resistance and bearing resistance shall not be assumed to act simultaneously unless recommended by a soil investigation as specified in Section 1802.

~~4808.2.8.5~~ 1810.3.3.1.5 **Uplift capacity of a single deep foundation element.** Where required by the design, the uplift capacity of a single ~~pier or pile~~ deep foundation element shall be determined by an approved method of analysis based on a minimum factor of safety of three or by load tests conducted in accordance with ASTM D 3689. The maximum allowable uplift load shall not exceed the ultimate load capacity as determined in Section ~~4808.2.8.3~~ 1810.3.3.1.2 divided by a factor of safety of two.

1810.3.3.1.6 **Uplift capacity of grouped deep foundation elements.** For ~~pile groups~~ grouped deep foundation elements subjected to uplift, the allowable working uplift load for the group shall be the lesser of:

1. The proposed individual ~~pile~~ pile uplift working load times the number of ~~piles elements~~ piles elements in the group.
2. Two-thirds of the effective weight of the ~~pile~~ pile group and the soil contained within a block defined by the perimeter of the group and the length of the ~~pile element~~ element.

~~4808.2.8.6~~ 1810.3.3.1.7 **Load-bearing capacity.** ~~Piers, individual piles and groups of piles~~ Deep foundation elements shall develop ultimate load capacities of at least twice the design working loads in the designated load-bearing layers. Analysis shall show that no soil layer underlying the designated load-bearing layers causes the load-bearing capacity safety factor to be less than two.

~~4808.2.8.7~~ 1810.3.3.1.8 **Bent piers or piles** deep foundation elements. The load-bearing capacity of ~~piers or piles~~ deep foundation elements discovered to have a sharp or sweeping bend shall be determined by an approved method of analysis or by load testing a representative ~~pier or pile element~~ element.

~~4808.2.9.3~~ 1810.3.3.2 **Allowable lateral load.** Where required by the design, the lateral load capacity of a ~~pier, a single pile~~ deep foundation element or a ~~pile~~ group thereof shall be determined by an approved method of analysis or by lateral load tests to at least twice the proposed design working load. The resulting allowable load shall not be more than one-half of that test load that produces a gross lateral movement of 1 inch (25 mm) at the ground surface.

~~4808.2.14~~ 1810.3.4 **Piles in Subsiding areas soils.** Where ~~piles~~ deep foundation elements are installed through subsiding fills or other subsiding strata and derive support from underlying firmer materials, consideration shall be given to the downward frictional forces that may be imposed on the ~~piles elements~~ piles elements by the subsiding upper strata.

Where the influence of subsiding fills is considered as imposing loads on the ~~pile element~~ element, the allowable stresses specified in this chapter ~~are~~ shall be permitted to be increased where satisfactory substantiating data are submitted.

1810.3.5 **Dimensions of deep foundation elements.** The dimensions of deep foundation elements shall be in accordance with Sections 1810.3.5.1 through 1810.3.5.3, as applicable.

~~4809.2.1.2~~ 1810.3.5.1 **Minimum dimension Precast.** The minimum lateral dimension of precast concrete deep foundation elements shall be 8 inches (203 mm). Corners of square ~~piles elements~~ elements shall be chamfered.

1810.3.5.2 **Cast-in-place or grouted-in-place.** Cast-in-place and grouted-in-place deep foundation elements shall satisfy the requirements of this section.

1810.3.5.2.1 **Cased.** Cast-in-place deep foundation elements with a permanent casing shall have a nominal outside diameter of not less than 8 inches (203 mm).

~~4840.3.2~~ 1810.3.5.2.2 **Dimensions Uncased.** Cast-in-place deep foundation elements without a permanent casing shall have a diameter of not less than 12 inches (305 mm). The ~~pile element~~ element length shall not exceed 30 times the average diameter. ~~The minimum diameter shall be 12 inches (305 mm).~~

Exception: The length of the ~~pile element~~ element is permitted to exceed 30 times the diameter, provided ~~that~~ the design and installation of the ~~pile foundation deep foundations~~ pile foundation deep foundations are under the direct supervision of a registered design professional knowledgeable in the field of soil mechanics and ~~pile deep foundations~~ pile deep foundations. The registered design professional shall certify to the building official that the ~~piles elements~~ piles elements were installed in compliance with the approved construction documents.

1810.3.5.2.3 Micropiles. Micropiles shall have an outside diameter of 12 inches (305 mm) or less. There is no minimum diameter for micropiles.

1810.3.5.3 Steel. Steel deep foundation elements shall satisfy the requirements of this section.

1809.3.3 1810.3.5.3.1 Dimensions of H-piles. Sections of H-piles shall comply with the following:

1. The flange projections shall not exceed 14 times the minimum thickness of metal in either the flange or the web and the flange widths shall not be less than 80 percent of the depth of the section.
2. The nominal depth in the direction of the web shall not be less than 8 inches (203 mm).
3. Flanges and web shall have a minimum nominal thickness of 3/8 inch (9.5 mm).

1809.3.4 1810.3.5.3.2 Dimensions of Steel pipes piles and tubes. Steel pipe piles driven open ended pipes and tubes used as deep foundation elements shall have a nominal outside diameter of not less than 8 inches (203 mm). ~~The pipe~~ Where steel pipes or tubes are driven open-ended, they shall have a minimum of 0.34 square inch (219 mm²) of steel in cross section to resist each 1,000 foot-pounds (1356 Nm) of pile hammer energy, or shall have the equivalent strength for steels having a yield strength greater than 35,000 psi (241 MPa) or the wave equation analysis shall be permitted to be used to assess compression stresses induced by driving to evaluate if the pile section is appropriate for the selected hammer. Where a pipe or tube with wall thickness less than 0.179 inch (4.6 mm) is driven open ended, a suitable cutting shoe shall be provided. Concrete filled steel pipes or tubes in structures assigned to Seismic Design Category C, D, E, or F shall have a wall thickness of not less than 3/16 inch (5 mm). The pipe or tube casing for socketed drilled shafts shall have a nominal outside diameter of not less than 18 inches (457 mm), a wall thickness of not less than 3/8 inch (9.5 mm), and a suitable steel driving shoe welded to the bottom; the diameter of the rock socket shall be approximately equal to the inside diameter of the casing.

Exceptions:

1. There is no minimum diameter for steel pipes or tubes used in micropiles.
2. ~~1810.6.3 Minimum dimensions.~~ Piles shall have a nominal outside diameter of not less than 8 inches (203 mm) and a minimum wall thickness in accordance with Section 1809.3.4. For mandrel-driven pipes or tubes piles, the minimum wall thickness shall be 1/10 inch (2.5 mm).

1808.2.7 1810.3.6 Splices. Splices shall be constructed so as to provide and maintain true alignment and position of the component parts of the pier or pile deep foundation element during installation and subsequent thereto and shall be of adequate strength to transmit the vertical and lateral loads and moments occurring at the location of the splice during driving and under service loading. Where deep foundation elements of the same type are being spliced, splices shall develop not less than 50 percent of the least capacity of the pier or pile in bending strength of the weaker section. Where deep foundation elements of different materials or different types are being spliced, splices shall develop the full compressive strength and not less than 50 percent of the tension and bending strength of the weaker section. Where structural steel cores are to be spliced, the ends shall be milled or ground to provide full contact and shall be full-depth welded.

~~In addition,~~ Splices occurring in the upper 10 feet (3048 mm) of the embedded portion of the pier or pile an element shall be capable of resisting at allowable working stresses the moment and shear that would result from an assumed eccentricity of the pier or pile axial load of 3 inches (76 mm), or the pier or pile element shall be braced in accordance with Section 1808.2.5 1810.2.2 to other piers or piles deep foundation elements that do not have splices in the upper 10 feet (3048 mm) of embedment.

1810.3.6.1 Seismic Design Categories C through F. For structures assigned to Seismic Design Category C, D, E, or F, splices of deep foundation elements shall develop the lesser of the following:

1. The full strength of the deep foundation element; and
2. The axial and shear forces and moments from the load combinations with overstrength factor in Section 12.4.3.2 of ASCE 7.

1810.3.7 Top of pile detailing at cutoffs. Where a minimum length for reinforcement or the extent of closely spaced confinement reinforcement is specified at the top of a deep foundation element, provisions shall be made so that those specified lengths or extents are maintained after cutoff.

1809.2 Precast concrete piles.

1809.2.1 1810.3.8 General Precast concrete piles. ~~The materials, reinforcement and installation of Precast concrete piles shall conform to be designed and detailed in accordance with Sections 1809.2.1.1 through 1809.2.1.4 1810.3.8.1 through 1810.3.8.3.~~

1809.2.1.3 1810.3.8.1 Reinforcement. Longitudinal steel shall be arranged in a symmetrical pattern and be laterally tied with steel ties or wire spiral spaced center to center as follows:

1. At not more than 1 inch (25 mm) for the first five ties or spirals at each end; then
2. At not more than 4 inches (102 mm) apart, center to center, for a distance of the remainder of the first 2 feet (610 mm) from the ends of the pile each end; and then
3. At not more than 6 inches (152 mm) elsewhere except that at the ends of each pile, the first five ties or spirals shall be spaced 1 inch (25 mm) center to center.

The ~~size~~ gage of ties and spirals shall be as follows:

1. For piles having a ~~diameter~~ least horizontal dimension of 16 inches (406 mm) or less, wire shall not be smaller than 0.22 inch (5.6 mm) (No. 5 gage).
2. For piles having a ~~diameter~~ least horizontal dimension of more than 16 inches (406 mm) and less than 20 inches (508 mm), wire shall not be smaller than 0.238 inch (6 mm) (No. 4 gage).
3. For piles having a ~~diameter~~ least horizontal dimension of 20 inches (508 mm) and larger, wire shall not be smaller than 0.25 inch (6.4 mm) round or 0.259 inch (6.6 mm) (No. 3 gage).

1809.2.2 1810.3.8.2 Precast nonprestressed piles. ~~Precast nonprestressed concrete piles shall conform to~~ comply with the requirements of Sections 1809.2.2.1 through 1809.2.2.5 1810.3.8.2.1 through 1810.3.8.2.3.

1809.2.2.2 1810.3.8.2.1 Minimum reinforcement. The minimum amount of Longitudinal reinforcement shall be 0.8 percent of the concrete section and shall consist of at least four bars consist of at least four bars with a minimum longitudinal reinforcement ratio of 0.008.

1809.2.2.2.4 1810.3.8.2.2 Seismic reinforcement in Seismic Design Category Categories C through F. Where a For structures is assigned to Seismic Design Category C, D, E, or F in accordance with Section 1613, the following shall apply precast nonprestressed piles shall be reinforced as specified in this section. The minimum longitudinal reinforcement with a minimum steel ratio of shall be 0.01 shall be provided throughout the length of precast concrete piles. Within three pile diameters of the bottom of the pile cap, the longitudinal reinforcement shall be confined with Transverse reinforcement shall consist of closed ties or spirals of with a minimum 3/8 inch (9.5 mm) diameter. Ties or spirals shall be provided at a maximum spacing of Spacing of transverse reinforcement shall not exceed the smaller of eight times the diameter of the smallest longitudinal bar not to exceed or, 6 inches (152 mm) within a distance of three times the least pile dimension from the bottom of the pile cap. Spacing of transverse reinforcement shall not exceed 6 inches (152 mm) throughout the remainder of the pile, the closed ties or spirals shall have a maximum spacing of 16 times the smallest longitudinal bar diameter, not to exceed 8 inches (203 mm).

1809.2.2.2.2 1810.3.8.2.3 Additional seismic reinforcement in Seismic Design Category Categories D through, E or F. Where a For structures is assigned to Seismic Design Category D, E or F in accordance with Section 1613, the requirements for Seismic Design Category C in Section 1809.2.2.2.1 shall apply except as modified by this section. Transverse confinement reinforcement consisting of closed ties or equivalent spirals shall be provided in accordance with Sections 21.4.4.1, 21.4.4.2 and 21.4.4.3 of ACI 318 within three pile diameters of the bottom of the pile cap. For other than Site Class E or F, or liquefiable sites and where spirals are used as the transverse reinforcement, it shall be permitted to use a volumetric ratio of spiral reinforcement of not less than one-half that required by Section 21.4.4.1(a) of ACI 318 transverse reinforcement shall be in accordance with Section 1810.3.9.4.2.

1809.2.3 1810.3.8.3 Precast prestressed piles. Precast prestressed concrete piles shall conform to comply with the requirements of Sections 1809.2.3.1 through 1809.2.3.5 1810.3.8.3.1 through 1810.3.8.3.3.

1809.2.3.2 1810.3.8.3.1 Design Effective prestress. Precast prestressed piles shall be designed to resist stresses induced by handling and driving as well as by loads. The effective prestress in the pile shall not be less than 400 psi (2.76MPa) for piles up to 30 feet (9144 mm) in length, 550 psi (3.79 MPa) for piles up to 50 feet (15 240 mm) in length and 700 psi (4.83 MPa) for piles greater than 50 feet (15 240 mm) in length. Effective prestress shall be based on an assumed loss of 30,000 psi (207 MPa) in the prestressing steel. The tensile stress in the prestressing steel shall not exceed the values specified in ACI 318.

1809.2.3.2.4 1810.3.8.3.2 Design Seismic reinforcement in Seismic Design Category C. Where a For structures is assigned to Seismic Design Category C in accordance with Section 1613, the following shall apply precast prestressed piles shall have transverse reinforcement in accordance with this section. The minimum volumetric ratio of spiral reinforcement shall not be less than 0.007 or the amount required by the following formula for the upper 20 feet (6096 mm) of the pile.

$$\rho_s = 0.12 f'_c / f_{yh} \text{ (Equation 18-4)}$$

where:

- f'_c = Specified compressive strength of concrete, psi (MPa)
- f_{yh} = Yield strength of spiral reinforcement \leq 85,000 psi (586 MPa).
- ρ_s = Spiral reinforcement index (vol. spiral/vol. core).

At least one-half the volumetric ratio required by Equation 18-4 shall be provided below the upper 20 feet (6096 mm) of the pile.

The pile cap connection by means of dowels as indicated in Section 1809.2.23.1 is permitted. Pile cap connection by means of developing pile reinforcing strand is permitted provided that the pile reinforcing strand results in a ductile connection.

1809.2.3.2.2 1810.3.8.3.3 Design Seismic reinforcement in Seismic Design Category Categories D through, E or F. Where a For structures is assigned to Seismic Design Category D, E or F in accordance with Section 1613, the requirements for Seismic Design Category C in Section 1809.2.3.2.1 shall be met, in addition to precast prestressed piles shall have transverse reinforcement in accordance with the following:

1. Requirements in ACI 318, Chapter 21, need not apply, unless specifically referenced.
2. Where the total pile length in the soil is 35 feet (10 668 mm) or less, the lateral transverse reinforcement in the ductile region shall occur through the length of the pile. Where the pile length exceeds 35 feet (10 668 mm), the ductile pile region shall be taken as the greater of 35 feet (10 668 mm) or the distance from the underside of the pile cap to the point of zero curvature plus three times the least pile dimension.
3. In the ductile region, the center-to-center spacing of the spirals or hoop reinforcement shall not exceed one-fifth of the least pile dimension, six times the diameter of the longitudinal strand, or 8 inches (203 mm), whichever is smaller smallest.
4. Circular spiral reinforcement shall be spliced by lapping one full turn and bending the end of the each spiral to a 90-degree hook or by use of a mechanical or welded splice complying with Sec. 12.14.3 of ACI 318.
5. Where the transverse reinforcement consists of circular spirals, the volumetric ratio of spiral transverse reinforcement in the ductile region shall comply with the following:

$$\rho_s = 0.25(f'_c / f_{yh})(A_g / A_{ch} - 1.0)[0.5 + 1.4P/(f'_c A_g)] \text{ (Equation 18-5)}$$

but not less than:

$$\rho_s = 0.12(f'_c / f_{yh}) [0.5 + 1.4P/(f'_c A_g)] \geq 0.12 f'_c / f_{yh} \text{ (Equation 18-6)}$$

and need not exceed:

$$\rho_s = 0.021 \text{ (Equation 18-7)}$$

where:

- A_g = Pile cross-sectional area, square inches (mm²).
- A_{ch} = Core area defined by spiral outside diameter, square inches (mm²).

- f'_c = Specified compressive strength of concrete, psi (MPa)
 f_{yh} = Yield strength of spiral reinforcement \leq 85,000 psi (586 MPa).
 P = Axial load on pile, pounds (kN), as determined from Equations 16-5 and ~~46-6~~ 16-7.
 ρ_s = Volumetric ratio (vol. spiral/ vol. core).

This required amount of spiral reinforcement is permitted to be obtained by providing an inner and outer spiral.

6. ~~When~~ Where transverse reinforcement consists of rectangular hoops and cross ties, the total cross-sectional area of lateral transverse reinforcement in the ductile region with spacing, s , and perpendicular to dimension, h_c , shall conform to:

$$A_{sh} = 0.3s h_c (f'_c / f_{yh})(A_g / A_{ch} - 1.0)[0.5 + 1.4P / (f'_c A_g)] \quad \text{(Equation 18-8)}$$

but not less than:

$$A_{sh} = 0.12s h_c (f'_c / f_{yh}) [0.5 + 1.4P / (f'_c A_g)] \quad \text{(Equation 18-9)}$$

where:

- f_{yh} = \leq 70,000 psi (483 MPa).
 h_c = Cross-sectional dimension of pile core measured center to center of hoop reinforcement, inch (mm).
 s = Spacing of transverse reinforcement measured along length of pile, inch (mm).
 A_{sh} = Cross-sectional area of transverse reinforcement, square inches (mm²)
 f'_c = Specified compressive strength of concrete, psi (MPa)

The hoops and cross ties shall be equivalent to deformed bars not less than No. 3 in size. Rectangular hoop ends shall terminate at a corner with seismic hooks.

Outside of the length of the pile requiring transverse confinement reinforcing, the spiral or hoop reinforcing with a volumetric ratio not less than one-half of that required for transverse confinement reinforcing shall be provided.

1810.3.9 Cast-in-place deep foundations. Cast-in-place deep foundation elements shall be designed and detailed in accordance with Sections 1810.3.9.1 through 1810.3.9.6.

1810.3.9.1 Design cracking moment. The design cracking moment (M_n) for a cast-in-place deep foundation element not enclosed by a structural steel pipe or tube shall be determined using the following equation:

$$\phi M_n = 3\sqrt{f'_c S_m} \quad \text{(Equation 18-10)}$$

where:

- f'_c = Specified compressive strength of concrete or grout, psi (MPa)
 S_m = Elastic section modulus, neglecting reinforcement and casing, in³ (mm³)

1810.3.9.2 Required reinforcement. Where subject to uplift or where the required moment strength determined using the load combinations of Section 1605.2 exceeds the design cracking moment determined in accordance with Section 1810.3.9.1, cast-in-place deep foundations not enclosed by a structural steel pipe or tube shall be reinforced.

1810.3.9.3 Placement of reinforcement. Except for steel dowels embedded 5 feet (1524 mm) or less in the pile and as provided in Section 1810.3.4, reinforcement where required shall be assembled and tied together and shall be placed in the pile deep foundation element as a unit before the reinforced portion of the pile element is filled with concrete, except in augered uncased cast-in-place piles. Tied reinforcement in augered uncased cast-in-place piles shall be placed after piles are concreted, while the concrete is still in a semifluid state.

Exceptions:

1. Steel dowels embedded 5 feet (1524 mm) or less shall be permitted to be placed after concreting, while the concrete is still in a semifluid state.
2. **1810.3.4 Reinforcement.** For piles deep foundation elements installed with a hollow-stem auger where full-length, tied reinforcement shall be placed after elements are concreted, while the concrete is still in a semifluid state. Longitudinal steel reinforcement is placed without lateral ties, the reinforcement shall be placed either through the hollow stem of the auger prior to filling the pile with concrete concreting or after concreting, while the concrete is still in a semifluid state. All pile reinforcement shall have a concrete cover of not less than 2.5 inches (64 mm).

Exception: Where physical constraints do not allow the placement of the longitudinal reinforcement prior to filling the pile with concrete or where partial-length longitudinal reinforcement is placed without lateral ties, the reinforcement is allowed to be placed after the piles are completely concreted but while concrete is still in a semifluid state.

3. For Group R-3 and U occupancies not exceeding two stories of light-frame construction, reinforcement is permitted to be placed after concreting, while the concrete is still in a semifluid state, and the concrete cover requirement is permitted to be reduced to 2 inches (51 mm), provided the construction method can be demonstrated to the satisfaction of the building official.

1810.3.9.4 Reinforcement seismic reinforcement. Except for steel dowels embedded 5 feet (1524 mm) or less in the pier, reinforcement where required shall be assembled and tied together and shall be placed in the pier hole as a unit before the reinforced portion of the pier is filled with concrete. Where a structure is assigned to Seismic Design Category C reinforcement shall be provided in accordance with Section 1810.3.9.4.1. Where a structure is assigned to Seismic Design Category D, E, or F reinforcement shall be provided in accordance with Section 1810.3.9.4.2.

Exception: Reinforcement is permitted to be wet set and the 2-1/2 inch (64 mm) concrete cover requirement be reduced to 2 inches (51 mm) for Group R-3 and U occupancies not exceeding two stories of light-frame construction, provided the construction method can be demonstrated to the satisfaction of the building official.

Reinforcement shall conform to the requirements of Sections 1810.1.2.1 and 1810.1.2.2.

Exceptions:

1. Isolated ~~piers deep foundation elements~~ supporting posts of Group R-3 and U occupancies not exceeding two stories of light-frame construction ~~are shall be~~ permitted to be reinforced as required by rational analysis but ~~with~~ not less than a ~~minimum of~~ one No. 4 bar, without ties or spirals, ~~when where~~ detailed so the ~~pier element~~ is not subject to lateral loads and the soil is ~~determined to be of adequate stiffness provides adequate lateral support in accordance with Section 1810.2.1.~~
2. Isolated ~~piers deep foundation elements~~ supporting posts and bracing from decks and patios appurtenant to Group R-3 and U occupancies not exceeding two stories of light-frame construction ~~are shall be~~ permitted to be reinforced as required by rational analysis but ~~with~~ not less than one No. 4 bar, without ties or spirals, ~~when where~~ the lateral load, E , to the top of the ~~pier element~~ does not exceed 200 pounds (890 N) and the soil is ~~determined to be of adequate stiffness provides adequate lateral support in accordance with Section 1810.2.1.~~
3. ~~Piers Deep foundation elements~~ supporting the concrete foundation wall of Group R-3 and U occupancies not exceeding two stories of light-frame construction ~~are shall be~~ permitted to be reinforced as required by rational analysis but ~~with~~ not less than two No. 4 bars, without ties or spirals, ~~when it can be shown the concrete pier will not rupture when designed for the maximum seismic load, E_{max} , where the design cracking moment determined in accordance with Section 1810.3.9.1 exceeds the required moment strength determined using the load combinations with overstrength factor in Section 12.4.3.2 of ASCE 7 and the soil is determined to be of adequate stiffness provides adequate lateral support in accordance with Section 1810.2.1.~~
4. Closed ties or spirals where required by Section ~~1810.1.2.2 1810.3.9.4.2~~ ~~are shall be~~ permitted to be limited to the top 3 feet (914 mm) of the ~~piers deep foundation elements~~ 10 feet (3048 mm) or less in depth supporting Group R-3 and U occupancies of Seismic Design Category D, not exceeding two stories of light-frame construction.

1810.1.2.4 1810.3.9.4.1 Seismic reinforcement in Seismic Design Category C. ~~For Where a structure is assigned to Seismic Design Category C in accordance with Section 1613, the following shall apply~~ cast-in-place deep foundation elements shall be reinforced as specified in this section. Reinforcement shall be provided where required by analysis.

A ~~minimum of four longitudinal bars, with a minimum longitudinal reinforcement ratio of 0.0025, shall be provided for uncased cast-in-place concrete drilled or augered piles, piers or caissons in the top throughout the minimum reinforced length of the element as defined below starting at the top of the element. The minimum reinforced length of the element shall be taken as the greatest of the following:~~

1. ~~One-third of the pile element length;~~
2. ~~A minimum length distance of 10 feet (3048 mm);~~
3. ~~Three times the least element dimension; and~~
4. ~~The distance from the top of the element to the point where the design cracking moment determined in accordance with Section 1810.3.9.1 exceeds the required moment strength determined using the load combinations of Section 1605.2, below the ground or that required by analysis, whichever length is greatest. The minimum reinforcement ratio, but no less than that ratio required by rational analysis, shall be continued throughout the flexural length of the pile. There shall be a minimum of four longitudinal bars with~~

~~Transverse reinforcement shall consist of closed ties (or equivalent spirals) of with a minimum 3/8 inch (9.5 mm) diameter provided at 16-longitudinal bar diameter maximum spacing. Transverse confinement reinforcement with a maximum. Spacing of transverse reinforcement shall not exceed the smaller of 6 inches (152 mm) or 8-longitudinal-bar diameters, whichever is less, shall be provided within a distance equal to of three times the least pile element dimension of from the bottom of the pile cap. Spacing of transverse reinforcement shall not exceed 16 longitudinal bar diameters throughout the remainder of the reinforced length.~~

Exceptions:

1. ~~The requirements of this section shall not apply to concrete cast in structural steel pipes or tubes.~~
2. ~~A spiral-welded metal casing of a thickness not less than manufacturer's standard gage No. 14 gage (0.068 inch) is permitted to provide concrete confinement in lieu of the closed ties or spirals. Where used as such, the metal casing shall be protected against possible deleterious action due to soil constituents, changing water levels or other factors indicated by boring records of site conditions.~~

1810.1.2.2 1810.3.9.4.2 Seismic reinforcement in Seismic Design Category Categories D, E or through F. ~~For Where a structure is assigned to Seismic Design Category D, E or F in accordance with Section 1613, the requirements for Seismic Design Category C given above shall be met, in addition to the following~~ cast-in-place deep foundation elements shall be reinforced as specified in this section. Reinforcement shall be provided where required by analysis.

A ~~minimum of four longitudinal bars, with a minimum longitudinal reinforcement ratio of 0.005 shall be provided for uncased cast-in-place drilled or augered concrete piles, piers or caissons in the top throughout the minimum reinforced length of the element as defined below starting at the top of the element. The minimum reinforced length of the element shall be taken as the greatest of the following:~~

1. ~~One-half of the pile element length;~~
2. ~~A minimum length distance of 10 feet (3048 mm);~~
3. ~~Three times the least element dimension; and~~
4. ~~The distance from the top of the element to the point where the design cracking moment determined in accordance with Section 1810.3.9.1 exceeds the required moment strength determined using the load combinations of Section 1605.2.~~

~~below ground or throughout the flexural length of the pile, whichever length is greatest. The flexural length shall be taken as the length of the pile to a point where the concrete section cracking moment strength multiplied by 0.4 exceeds the required moment strength at that point. There shall be a minimum of four longitudinal bars with transverse confinement reinforcement provided in the pile in accordance with Sections 21.4.4.1, 21.4.4.2 and 21.4.4.3 of ACI 318 within three times the least pile dimension of the bottom of the pile cap. A transverse spiral reinforcement ratio of not less than one-half of that required in Section 21.4.4.1(a) of ACI 318 for other than Class E, F or liquefiable sites is permitted. Tie spacing throughout the remainder of the concrete section shall not exceed 12-longitudinal-bar diameters, one-half the least dimension of the section, nor 12 inches (305 mm). Ties shall be a minimum of No. 3 bars for piles with a least dimension up to 20 inches (508 mm), and No. 4 bars for larger piles.~~

~~Transverse reinforcement shall consist of closed ties or spirals no smaller than No. 3 bars for elements with a least dimension up to 20 inches (508 mm), and No. 4 bars for larger elements. Throughout the remainder of the reinforced length outside the regions with transverse confinement reinforcement, as specified in Section 1810.3.9.4.2.1 or 1810.3.9.4.2.2, the spacing of transverse reinforcement shall not exceed the least of the following:~~

1. 12 longitudinal bar diameters;
2. One-half the least dimension of the element; and
3. 12 inches (305 mm).

Exceptions:

1. The requirements of this section shall not apply to concrete cast in structural steel pipes or tubes.
2. ~~1810.5.4.1 Seismic reinforcement.~~ Where a structure is assigned to Seismic Design Category C, D, E or F in accordance with Section 1613, the reinforcement requirements for drilled or augered uncased piles in Section 1810.3.5 shall be met.

Exception: A spiral-welded metal casing of a thickness not less than manufacturer's standard gage No. 14 gage (0.068 inch) is permitted to provide concrete confinement in lieu of the closed ties or ~~equivalent spirals required in an uncased concrete pile.~~ Where used as such, the metal casing shall be protected against possible deleterious action due to soil constituents, changing water levels or other factors indicated by boring records of site conditions.

1810.3.9.4.2.1 Site Classes A through D. For Site Class A, B, C, or D sites, transverse confinement reinforcement shall be provided in the element in accordance with Sections 21.4.4.1, 21.4.4.2 and 21.4.4.3 of ACI 318 within three times the least element dimension of the bottom of the pile cap. A transverse spiral reinforcement ratio of not less than one-half of that required in Section 21.4.4.1(a) of ACI 318 shall be permitted.

1810.3.9.4.2.2 Site Classes E and F. For Site Class E or F sites, transverse confinement reinforcement shall be provided in the element in accordance with Sections 21.4.4.1, 21.4.4.2 and 21.4.4.3 of ACI 318 within seven times the least element dimension of the pile cap and within seven times the least element dimension of the interfaces of strata that are hard or stiff and strata that are liquefiable or are composed of soft to medium stiff clay.

~~1812.6~~ **1810.3.9.5 Belled bottoms drilled shafts.** Where pier foundations drilled shafts are belled at the bottom, the edge thickness of the bell shall not be less than that required for the edge of footings. Where the sides of the bell slope at an angle less than 60 degrees (1 rad) from the horizontal, the effects of vertical shear shall be considered.

~~1810.7.1~~ **1810.3.9.6 Construction Socketed drilled shafts.** ~~Caisson piles shall consist of a shaft section of concrete filled pipe extending to bedrock with an uncased socket drilled into the bedrock and filled with concrete.~~ Socketed drilled shafts shall have a permanent pipe or tube casing that extends down to bedrock and an uncased socket drilled into the bedrock, both filled with concrete. ~~The caisson pile~~ Socketed drilled shafts shall have a full-length structural steel core or a stub core installed in the rock socket and extending into the pipe portion a distance equal to the socket depth.

~~1810.7.3~~ **Design.** The depth of the rock socket shall be sufficient to develop the full load-bearing capacity of the ~~caisson pile element~~ with a minimum safety factor of two, but the depth shall not be less than the outside diameter of the pipe ~~or tube casing~~. The design of the rock socket is permitted to be predicated on the sum of the allowable load-bearing pressure on the bottom of the socket plus bond along the sides of the socket. ~~The minimum outside diameter of the caisson pile shall be 18 inches (457 mm), and the diameter of the rock socket shall be approximately equal to the inside diameter of the pile.~~

~~1810.7.4~~ **Structural core.** The gross cross-sectional area of the structural steel core shall not exceed 25 percent of the gross area of the ~~caisson drilled shaft~~. The minimum clearance between the structural core and the pipe shall be 2 inches (51 mm). ~~Where cores are to be spliced, the ends shall be milled or ground to provide full contact and shall be full depth welded.~~

~~1810.8~~ **1810.3.10 [Supp] Micropiles.** Micropiles shall ~~comply with the requirements of~~ be designed and detailed in accordance with Sections 1810.8.1 through 1810.8.5 ~~1810.3.10.1 through 1810.3.10.4.~~

~~1810.8.1~~ **1810.3.10.1 [Supp] Construction.** ~~Micropiles shall consist of a grouted section reinforced with steel pipe or steel reinforcement.~~ Micropiles shall develop their load-carrying capacity ~~through by means of a bond zone in soil, bedrock or a combination of soil and bedrock.~~ ~~The steel pipe or steel reinforcement shall extend the full length of the micropile.~~ Micropiles shall be grouted and have either a steel pipe or tube or steel reinforcement at every section along the length. It shall be permitted to transition from deformed reinforcing bars to steel pipe or tube reinforcement by extending the bars into the pipe or tube section by at least their tension development length.

~~1810.8.2~~ **1810.3.10.2 [Supp] Materials.** ~~Grout shall have a specified compressive strength (f'_c) of not less than 4,000 psi (27.58 Mpa). The grout mix shall be designed and proportioned so as to produce a pumpable mixture.~~ Reinforcement shall consist of deformed reinforcing bars in accordance with ASTM A 615 Grade 60 or 75 or ASTM A 722 Grade 150.

The steel pipe ~~or tube~~ shall have a minimum wall thickness of 3/16 inch (4.8 mm). Splices shall comply with Section ~~1808.2.7~~ 1810.3.6. The steel pipe ~~or tube~~ shall have a minimum yield strength ~~exceeding~~ of 45,000 psi (310 MPa) and a minimum elongation of 15 percent as shown by mill certifications or two coupon test samples per 40,000 pounds (18 160 kg) of pipe ~~or tube~~.

~~1810.8.4~~ **1810.3.10.3 [Supp] Reinforcement.** For ~~micropiles or portions thereof~~ piles grouted inside a temporary or permanent casing or inside a hole drilled into bedrock or a hole drilled with grout, the steel pipe ~~or tube~~ or steel reinforcement shall be designed to carry at least 40 percent of the design compression load. ~~Micropiles or portions thereof~~ piles grouted in an open hole in soil without temporary or permanent casing and without suitable means of verifying the hole diameter during grouting shall be designed to carry the entire compression load in the reinforcing steel. Where a steel pipe ~~or tube~~ is used for reinforcement, the portion of the grout enclosed within the pipe is permitted to be included in the determination of the allowable stress in the grout.

~~1810.8.4.1~~ **1810.3.10.4 [Supp] Seismic reinforcement.** ~~Where a~~ For structures is assigned to Seismic Design Category C, a permanent steel casing shall be provided from the top of the ~~micropile~~ down a ~~minimum of 120 percent of the flexural length to the point of zero curvature.~~ ~~Where a~~ For structures is assigned to Seismic Design D, E or F, the ~~micropile~~ shall be considered as an alternative system in accordance with Section 104.11. The alternative ~~pile~~ system design, supporting documentation and test data shall be submitted to the building official for review and approval.

~~1808.2.4~~ **1810.3.11 Pile caps.** Pile caps shall be of reinforced concrete, and shall include all elements to which ~~piles~~ vertical deep foundation elements are connected, including grade beams and mats. The soil immediately below the pile cap shall not be considered as carrying any vertical load. The tops of ~~piles~~ vertical deep foundation elements shall be embedded not less than 3 inches (76 mm) into pile caps and the caps shall extend at least 4 inches (102 mm) beyond the edges of ~~piles~~ the elements. The tops of ~~piles~~ elements shall be cut ~~or chipped~~ back to sound material before capping.

1808.2.23.1.4 1810.3.11.1 Connection to pile cap Seismic Design Categories C through F. Concrete piles and concrete-filled steel pipe piles For structures assigned to Seismic Design Category C, D, E, or F in accordance with Section 1613, concrete deep foundation elements shall be connected to the pile cap by embedding the pile element reinforcement or field-placed dowels anchored in the concrete pile element into the pile cap for a distance equal to the their development length in accordance with ACI 318. It shall be permitted to connect precast prestressed piles to the pile cap by developing the element prestressing strands into the pile cap provided the connection is ductile. For deformed bars, the development length is the full development length for compression, or tension, in the case of uplift, without reduction in length for excess area reinforcement in accordance with Section 12.2.5 of ACI 318. Alternative measures for laterally confining concrete and maintaining toughness and ductile-like behavior at the top of the pile will element shall be permitted provided the design is such that any hinging occurs in the confined region.

Ends of hoops, spirals and ties shall be terminated with seismic hooks, as defined in Section 21.1 of ACI 318 turned into the confined concrete core. The minimum transverse steel ratio for confinement shall not be less than one-half of that required for columns.

For resistance to uplift forces, anchorage of steel pipe (round HSS sections), concrete-filled steel pipe or pipes, tubes, or H-piles to the pile cap shall be made by means other than concrete bond to the bare steel section. Concrete-filled steel pipes or tubes shall have reinforcement of not less than 0.01 times the cross-sectional area of the concrete fill developed into the cap and extending into the fill a length equal to two times the required cap embedment, but not less than the tension development length of the reinforcement.

Exception: Anchorage of concrete-filled steel pipe piles is permitted to be accomplished using deformed bars developed into the concrete portion of the pile.

Splices of pile segments shall develop the full strength of the pile, but the splice need not develop the nominal strength of the pile in tension, shear and bending when it has been designed to resist axial and shear forces and moments from the load combinations of Section 1605.4.

1808.2.23.2.2 1810.3.11.2 Connection to pile cap Seismic Design Categories D through F. For piles required to resist structures assigned to Seismic Design Category D, E, or F in accordance with Section 1613, deep foundation element resistance to uplift forces or provide rotational restraint, design of anchorage of piles into the pile cap shall be provided shall be provided by anchorage into the pile cap, designed considering the combined effect of axial forces due to uplift and bending moments due to fixity to the pile cap. Anchorage shall develop a minimum of 25 percent of the strength of the pile element in tension. Anchorage into the pile cap shall be capable of developing the following:

1. In the case of uplift, the lesser least of the following: nominal tensile strength of the longitudinal reinforcement in a concrete pile element; or the nominal tensile strength of a steel pile element; or the pile uplift soil nominal strength factored frictional force developed between the element and the soil multiplied by 1.3; or and the axial tension force resulting from the load combinations of Section 1605.4.
2. In the case of rotational restraint, the lesser of the following: the axial and force, shear forces, and bending moments resulting from the load combinations of Section 1605.4; or and development of the full axial, bending and shear nominal strength of the pile element.

1808.2.23.2.3 Flexural strength. Where the vertical lateral-force-resisting elements are columns, the grade beam or pile cap flexural strengths shall exceed the column flexural strength. The connection between batter piles and grade beams or pile caps shall be designed to resist the nominal strength of the pile acting as a short column. Batter piles and their connection shall be capable of resisting forces and moments from the load combinations of Section 1605.4.

1810.3.12 Grade beams. For structures assigned to Seismic Design Category D, E, or F in accordance with Section 1613, grade beams shall comply with the provisions in Section 21.10.3 of ACI 318 for grade beams, except where they have the capacity to resist the forces from the load combinations with overstrength factor in Section 12.4.3.2 of ASCE 7.

1808.2.23.4 1810.3.13 [Supp] Seismic Design Category C Seismic ties. Where a For structures is assigned to Seismic Design Category C, D, E, or F in accordance with Section 1613, the following shall apply. Individual pile caps, piers or piles deep foundations shall be interconnected by ties. Ties shall be capable of carrying, in tension and compression, a force equal to the product of the larger pile cap or column load times the seismic coefficient, S_{DS} , divided by 10 unless it can be demonstrated that equivalent restraint is provided by reinforced concrete beams within slabs on grade or reinforced concrete slabs on grade or confinement by competent rock, hard cohesive soils or very dense granular soils.

Exception: In Group R-3 and U occupancies of light-frame construction, pier foundations deep foundation elements supporting foundation walls, isolated interior posts detailed so the pier element is not subject to lateral loads, or exterior decks and patios are not subject to interconnection if it can be shown where the soils are of adequate stiffness, subject to the approval of the building official.

1810.4 Installation. Deep foundations shall be installed in accordance with Section 1810.4. Where a single deep foundation element comprises two or more sections of different materials or different types spliced together, each section shall satisfy the applicable conditions of installation.

1808.2.6 1810.4.1 Structural integrity. Piers or piles Deep foundation elements shall be installed in such a manner and sequence as to prevent distortion or damage that may adversely affect the structural integrity of piles adjacent structures or of foundation elements being installed or already in place and as to avoid compacting the surrounding soil to the extent that other foundation elements cannot be installed properly.

1809.2.2.4 1810.4.1.1 Installation Compressive strength of precast concrete piles. A precast concrete pile shall not be driven before the concrete has attained a compressive strength of at least 75 percent of the 28-day specified compressive strength (f'_c), but not less than the strength sufficient to withstand handling and driving forces.

1810.4.1.2 Casing. Where cast-in-place deep foundation elements are formed through unstable soils and concrete is placed in an open-drilled hole, a casing shall be inserted in the hole prior to placing the concrete. Where the casing is withdrawn during concreting, the level of concrete shall be maintained above the bottom of the casing at a sufficient height to offset any hydrostatic or lateral soil pressure. Driven casings shall be mandrel driven their full length in contact with the surrounding soil.

1840.4.3 1810.4.1.3 Installation Driving near uncased concrete. Piles Deep foundation elements shall not be driven within six pile element diameters center to center in granular soils or within one-half the pile element length in cohesive soils of a pile an uncased element filled with concrete less than 48 hours old unless approved by the building official. If the concrete surface in any completed pile element rises or drops, the pile element shall be replaced. Piles Driven uncased deep foundation elements shall not be installed in soils that could cause pile heave.

1840.5.3 1810.4.1.4 Installation Driving near cased concrete. Steel shells shall be mandrel driven their full length in contact with the surrounding soil.

The steel shells shall be driven in such order and with such spacing as to ensure against distortion of or injury to piles already in place. A pile Deep foundation elements shall not be driven within four and one-half average pile diameters of a pile cased element filled with concrete less than 24 hours old unless approved by the building official. Concrete shall not be placed in steel shells casings within heave range of driving.

1809.4.3 1810.4.1.5 Defective timber piles. Any substantial sudden increase in rate of penetration of a timber pile shall be investigated for possible damage. If the sudden increase in rate of penetration cannot be correlated to soil strata, the pile shall be removed for inspection or rejected.

1808.2.20 1810.4.2 Identification. ~~Pier or pile~~ Deep foundation materials shall be identified for conformity to the specified grade with this identity maintained continuously from the point of manufacture to the point of installation or shall be tested by an approved agency to determine conformity to the specified grade. The approved agency shall furnish an affidavit of compliance to the building official.

1808.2.24 1810.4.3 Pier or pile Location plan. A plan showing the location and designation of ~~piers or piles~~ deep foundation elements by an identification system shall be filed with the building official prior to installation of such ~~piers or piles~~ elements. Detailed records for ~~piers or individual piles~~ elements shall bear an identification corresponding to that shown on the plan.

1808.2.43 1810.4.4 Preexcavation. The use of jetting, augering or other methods of preexcavation shall be subject to the approval of the building official. Where permitted, preexcavation shall be carried out in the same manner as used for ~~piers or piles~~ deep foundation elements subject to load tests and in such a manner that will not impair the carrying capacity of the ~~piers or piles~~ elements already in place or damage adjacent structures. Pile Element tips shall be driven below the preexcavated depth until the required resistance or penetration is obtained.

1808.2.45 1810.4.5 Use of Vibratory drivers driving. Vibratory drivers shall only be used to install piles deep foundation elements where the pile element load capacity is verified by load tests in accordance with Section ~~1808.2.8.3~~ 1810.3.3.1.2. The installation of production piles elements shall be controlled according to power consumption, rate of penetration or other approved means that ensure pile element capacities equal or exceed those of the test piles elements.

1808.2.49 1810.4.6 Heaved piles elements. Piles Deep foundation elements that have heaved during the driving of adjacent piles elements shall be redriven as necessary to develop the required capacity and penetration, or the capacity of the pile element shall be verified by load tests in accordance with Section ~~1808.2.8.3~~ 1810.3.3.1.2.

1810.4.7 Enlarged base cast-in-place elements 1810.2.3 Installation. Enlarged bases for cast-in-place deep foundation elements formed either by compacting concrete or by driving a precast base shall be formed in or driven into granular soils. ~~Piles~~ Such elements shall be constructed in the same manner as successful prototype test piles elements driven for the project. ~~Pile~~ Shafts extending through peat or other organic soil shall be encased in a permanent steel casing. Where a cased shaft is used, the shaft shall be adequately reinforced to resist column action or the annular space around the pile-shaft shall be filled sufficiently to reestablish lateral support by the soil. Where pile heave occurs, the pile element shall be replaced unless it is demonstrated that the pile element is undamaged and capable of carrying twice its design load.

1810.3.3 1810.4.8 Installation Hollow-stem augered, cast-in-place elements. ~~Where pile shafts are formed through unstable soils and concrete is placed in an open drilled hole, a steel liner shall be inserted in the hole prior to placing the concrete. Where the steel liner is withdrawn during concreting, the level of concrete shall be maintained above the bottom of the liner at a sufficient height to offset any hydrostatic or lateral soil pressure.~~

Where concrete is placed by pumping through a hollow-stem auger, the auger shall be permitted to rotate in a clockwise direction during withdrawal. The auger shall be withdrawn in continuous increments. Concreting pumping pressures shall be measured and maintained high enough at all times to offset hydrostatic and lateral earth pressures. Concrete volumes shall be measured to ensure that the volume of concrete placed in each pile element is equal to or greater than the theoretical volume of the hole created by the auger. Where the installation process of any pile element is interrupted or a loss of concreting pressure occurs, the pile element shall be redrilled to 5 feet (1524 mm) below the elevation of the tip of the auger when the installation was interrupted or concrete pressure was lost and reformed. Augered cast-in-place piles elements shall not be installed within six pile diameters center to center of a pile an element filled with concrete less than 12 hours old, unless approved by the building official. If the concrete level in any completed pile element drops due to installation of an adjacent pile element, the pile element shall be replaced.

1810.7.6 1810.4.9 Installation Socketed drilled shafts. The rock socket and pile pipe or tube casing of socketed drilled shafts shall be thoroughly cleaned of foreign materials before filling with concrete. Steel cores shall be bedded in cement grout at the base of the rock socket. ~~Concrete shall not be placed through water except where a tremie or other approved method is used.~~

1810.8.5 1810.4.10 Installation Micropiles. The pile Micropile deep foundation elements shall be permitted to be formed in a holes advanced by rotary or percussive drilling methods, with or without casing. The pile elements shall be grouted with a fluid cement grout. The grout shall be pumped through a tremie pipe extending to the bottom of the pile element until grout of suitable quality returns at the top of the pile element. The following requirements apply to specific installation methods:

1. For micropiles grouted inside a temporary casing, the reinforcing bars shall be inserted prior to withdrawal of the casing. The casing shall be withdrawn in a controlled manner with the grout level maintained at the top of the pile element to ensure that the grout completely fills the drill hole. During withdrawal of the casing, the grout level inside the casing shall be monitored to ~~check~~ verify that the flow of grout inside the casing is not obstructed.
2. For a micropile or portion thereof ~~a pile~~ grouted in an open drill hole in soil without temporary casing, the minimum design diameter of the drill hole shall be verified by a suitable device during grouting.
3. For micropiles designed for end bearing, a suitable means shall be employed to verify that the bearing surface is properly cleaned prior to grouting.
4. Subsequent micropiles shall not be drilled near piles elements that have been grouted until the grout has had sufficient time to harden.
5. Micropiles shall be grouted as soon as possible after drilling is completed.
6. For micropiles designed with a full length casing, the casing shall be pulled back to the top of the bond zone and reinserted or some other suitable means employed to assure grout coverage outside the casing.

1808.2.22 1810.4.11 Special inspection. Special inspections in accordance with Sections 1704.8 and 1704.9 shall be provided for piles and piers driven and cast-in-place deep foundation elements, respectively.

1808.2.23.2 Seismic Design Category D, E or F. Where a structure is assigned to Seismic Design Category D, E or F in accordance with Section 1613, the requirements for Seismic Design Category C given in Section 1808.2.23.1 shall be met, in addition to the following. Provisions of ACI 318, Section 21.10.4, shall apply when not in conflict with the provisions of Sections 1808 through 1812. Concrete shall have a specified compressive strength of not less than 3,000 psi (20.68 MPa) at 28 days.

Exceptions:

1. Group R or U occupancies of light-framed construction and two stories or less above grade plane are permitted to use concrete with a specified compressive strength of not less than 2,500 psi (17.2 MPa) at 28 days.
2. Detached one- and two-family dwellings of light-frame construction and two stories or less in height are not required to comply with the provisions of ACI 318, Section 21.10.4.
3. Section 21.10.4.4(a) of ACI 318 need not apply to concrete piles.

1809.2.3.1 Materials. Prestressing steel shall conform to ASTM A 416. Concrete shall have a 28-day specified compressive strength (f'_c) of not less than 5,000 psi (34.48 MPa).

1810.5.4 Reinforcement. Reinforcement shall not be placed within 1 inch (25 mm) of the steel shell. Reinforcing shall be required for unsupported pile lengths or where the pile is designed to resist uplift or unbalanced lateral loads.

1810.6.4 Reinforcement. Reinforcement steel shall conform to Section 1810.1.2. Reinforcement shall not be placed within 1 inch (25 mm) of the steel casing.

1810.7.2 Materials. Pipe and steel cores shall conform to the material requirements in Section 1809.3. Pipes shall have a minimum wall thickness of 3/8 inch (9.5 mm) and shall be fitted with a suitable steel driving shoe welded to the bottom of the pipe. Concrete shall have a 28-day specified compressive strength (f'_c) of not less than 4,000 psi (27.58 MPa). The concrete mix shall be designed and proportioned so as to produce a cohesive workable mix with a slump of 4 inches to 6 inches (102 mm to 152 mm).

Delete without substitution:

~~**1808.2.8 Allowable pier or pile loads.**~~

~~**1808.2.14 Installation sequence.** Piles shall be installed in such sequence as to avoid compacting the surrounding soil to the extent that other piles cannot be installed properly, and to prevent ground movements that are capable of damaging adjacent structures.~~

~~**1808.2.16 Pile driveability.** Pile cross sections shall be of sufficient size and strength to withstand driving stresses without damage to the pile, and to provide sufficient stiffness to transmit the required driving forces.~~

~~**1808.2.23 Seismic design of piers or piles.**~~

**SECTION 1809
DRIVEN PILE FOUNDATIONS**

~~**1809.1.4 Allowable stresses.** The allowable stresses shall be in accordance with the AF&PA NDS.~~

~~**1809.2 Precast concrete piles.**~~

~~**1809.2.1.4 Installation.** Piles shall be handled and driven so as not to cause injury or overstressing, which affects durability or strength.~~

~~**1809.2.2.1 Materials.** Concrete shall have a 28-day specified compressive strength (f'_c) of not less than 3,000 psi (20.68 MPa).~~

~~**1809.2.2.3 Allowable stresses.** The allowable compressive stress in the concrete shall not exceed 33 percent of the 28-day specified compressive strength (f'_c) applied to the gross cross-sectional area of the pile. The allowable compressive stress in the reinforcing steel shall not exceed 40 percent of the yield strength of the steel (f_y) or a maximum of 30,000 psi (207 MPa). The allowable tensile stress in the reinforcing steel shall not exceed 50 percent of the yield strength of the steel (f_y) or a maximum of 24,000 psi (165 MPa).~~

~~**1809.2.2.5 Concrete cover.** Reinforcement for piles that are not manufactured under plant conditions shall have a concrete cover of not less than 2 inches (51 mm).~~

~~Reinforcement for piles manufactured under plant control conditions shall have a concrete cover of not less than 1.25 inches (32 mm) for No. 5 bars and smaller, and not less than 1.5 inches (38 mm) for No. 6 through No. 11 bars except that longitudinal bars spaced less than 1.5 inches (38 mm) clear distance apart shall be considered bundled bars for which the minimum concrete cover shall be equal to that for the equivalent diameter of the bundled bars. Reinforcement for piles exposed to seawater shall have a concrete cover of not less than 3 inches (76 mm).~~

~~**1809.2.3.3 Allowable stresses.** The allowable design compressive stress, f_e , in concrete shall be determined as follows:~~

~~$$f_e = 0.33 f'_c - 0.27 f_{pe} \quad \text{(Equation 18-10)}$$~~

~~where:~~

~~f'_c = The 28-day specified compressive strength of the concrete.~~

~~f_{pe} = The effective prestress stress on the gross section.~~

~~**1809.2.3.4 Installation.** A prestressed pile shall not be driven before the concrete has attained a compressive strength of at least 75 percent of the 28-day specified compressive strength (f'_c), but not less than the strength sufficient to withstand handling and driving forces.~~

~~**1809.2.3.5 Concrete cover.** Prestressing steel and pile reinforcement shall have a concrete cover of not less than 1-1/4 inches (32 mm) for square piles of 12 inches (305 mm) or smaller size and 1-1/2 inches (38 mm) for larger piles, except that for piles exposed to seawater, the minimum protective concrete cover shall not be less than 2-1/2 inches (64 mm).~~

~~**1809.3 Structural steel piles.** Structural steel piles shall conform to the requirements of Sections 1809.3.1 through 1809.3.4.~~

1809.3.2 Allowable stresses. The allowable axial stresses shall not exceed 35 percent of the minimum specified yield strength (F_y).

Exception: Where justified in accordance with Section 1808.2.10, the allowable axial stress is permitted to be increased above $0.35F_y$, but shall not exceed $0.5F_y$.

SECTION 1810 CAST-IN-PLACE CONCRETE PILE FOUNDATIONS

1810.1 General. The materials, reinforcement and installation of cast-in-place concrete piles shall conform to Sections 1810.1.1 through 1810.1.3.

1810.1.3 Concrete placement. Concrete shall be placed in such a manner as to ensure the exclusion of any foreign matter and to secure a full-sized shaft. Concrete shall not be placed through water except where a tremie or other approved method is used. When depositing concrete from the top of the pile, the concrete shall not be chuted directly into the pile but shall be poured in a rapid and continuous operation through a funnel hopper centered at the top of the pile.

1810.2 Enlarged base piles. Enlarged base piles shall conform to the requirements of Sections 1810.2.1 through 1810.2.5.

1810.2.2 Allowable stresses. The maximum allowable design compressive stress for concrete not placed in a permanent steel casing shall be 25 percent of the 28-day specified compressive strength (f'_c). Where the concrete is placed in a permanent steel casing, the maximum allowable concrete stress shall be 33 percent of the 28-day specified compressive strength (f'_c).

1810.2.4 Load-bearing capacity. Pile load-bearing capacity shall be verified by load tests in accordance with Section 1808.2.8.3.

1810.2.5 Concrete cover. The minimum concrete cover shall be 2-1/2 inches (64 mm) for uncased shafts and 1 inch (25 mm) for cased shafts.

1810.3 Drilled or augered uncased piles. Drilled or augered uncased piles shall conform to Sections 1810.3.1 through 1810.3.5.

1810.3.1 Allowable stresses. The allowable design stress in the concrete of drilled or augered uncased piles shall not exceed 33 percent of the 28-day specified compressive strength (f'_c). The allowable compressive stress of reinforcement shall not exceed 40 percent of the yield strength of the steel or 25,500 psi (175.8 MPa).

1810.3.5 Reinforcement in Seismic Design Category C, D, E or F. Where a structure is assigned to Seismic Design Category C, D, E or F in accordance with Section 1613, the corresponding requirements of Sections 1810.1.2.1 and 1810.1.2.2 shall be met.

1810.4 Driven uncased piles. Driven uncased piles shall conform to Sections 1810.4.1 through 1810.4.4.

1810.4.1 Allowable stresses. The allowable design stress in the concrete shall not exceed 25 percent of the 28-day specified compressive strength (f'_c) applied to a cross-sectional area not greater than the inside area of the drive casing or mandrel.

1810.4.2 Dimensions. The pile length shall not exceed 30 times the average diameter. The minimum diameter shall be 12 inches (305 mm).

Exception: The length of the pile is permitted to exceed 30 times the diameter, provided that the design and installation of the pile foundation is under the direct supervision of a registered design professional knowledgeable in the field of soil mechanics and pile foundations. The registered design professional shall certify to the building official that the piles were installed in compliance with the approved design.

1810.4.4 Concrete cover. Pile reinforcement shall have a concrete cover of not less than 2.5 inches (64 mm), measured from the inside face of the drive casing or mandrel.

1810.5 Steel-cased piles. Steel-cased piles shall comply with the requirements of Sections 1810.5.1 through 1810.5.4.

1810.6 Concrete-filled steel pipe and tube piles. Concrete-filled steel pipe and tube piles shall conform to the requirements of Sections 1810.6.1 through 1810.6.5.

1810.6.1 Materials. Steel pipe and tube sections used for piles shall conform to ASTM A 252 or ASTM A 283. Concrete shall conform to Section 1810.1.1. The maximum coarse aggregate size shall be 3/4 inch (19.1 mm).

1810.6.2 Allowable stresses. The allowable design compressive stress in the concrete shall not exceed 33 percent of the 28-day specified compressive strength (f'_c). The allowable design compressive stress in the steel shall not exceed 35 percent of the minimum specified yield strength of the steel (F_y), provided F_y shall not be assumed greater than 36,000 psi (248 MPa) for computational purposes.

Exception: Where justified in accordance with Section 1808.2.10, the allowable stresses are permitted to be increased to $0.50 F_y$.

1810.6.4.1 Seismic reinforcement. Where a structure is assigned to Seismic Design Category C, D, E or F in accordance with Section 1613, the following shall apply. Minimum reinforcement no less than 0.01 times the cross-sectional area of the pile concrete shall be provided in the top of the pile with a length equal to two times the required cap embedment anchorage into the pile cap, but not less than the tension development length of the reinforcement. The wall thickness of the steel pipe shall not be less than 3/16 inch (5 mm).

1810.6.5 Placing concrete. The placement of concrete shall conform to Section 1810.1.3, but is permitted to be chuted directly into smooth-sided pipes and tubes without a centering funnel hopper.

1810.7 Caisson piles. Caisson piles shall conform to the requirements of Sections 1810.7.1 through 1810.7.6.

1810.7.5 Allowable stresses. The allowable design compressive stresses shall not exceed the following: concrete, $0.33 f'_c$; steel pipe, $0.35 F_y$; and structural steel core, $0.50 F_y$.

1810.8.3 Allowable stresses. The allowable compressive stress in the grout shall not exceed $0.33 f'_c$. The allowable compressive stress in the steel pipe and steel reinforcement shall not exceed the lesser of $0.4 F_y$ and 32,000 psi (220 Mpa). The allowable tensile stress in the steel reinforcement shall not exceed $0.60 F_y$. The allowable tensile stress in the cement grout shall be zero.

SECTION 1811 COMPOSITE PILES

1811.1 General. Composite piles shall conform to the requirements of Sections 1811.2 through 1811.5.

1811.2 Design. Composite piles consisting of two or more approved pile types shall be designed to meet the conditions of installation.

1811.3 Limitation of load. The maximum allowable load shall be limited by the capacity of the weakest section incorporated in the pile.

1811.4 Splices. Splices between concrete and steel or wood sections shall be designed to prevent separation both before and after the concrete portion has set, and to ensure the alignment and transmission of the total pile load. Splices shall be designed to resist uplift caused by upheaval during driving of adjacent piles, and shall develop the full compressive strength and not less than 50 percent of the tension and bending strength of the weaker section.

1811.5 Seismic reinforcement. Where a structure is assigned to Seismic Design Category C, D, E or F in accordance with Section 1613, the following shall apply. Where concrete and steel are used as part of the pile assembly, the concrete reinforcement shall comply with that given in Sections 1810.1.2.1 and 1810.1.2.2 or the steel section shall comply with Section 1810.6.4.1.

SECTION 1812 PIER FOUNDATIONS

1812.1 General. Isolated and multiple piers used as foundations shall conform to the requirements of Sections 1812.2 through 1812.10, as well as the applicable provisions of Section 1808.2.

1812.2 Lateral dimensions and height. The minimum dimension of isolated piers used as foundations shall be 2 feet (610 mm), and the height shall not exceed 12 times the least horizontal dimension.

1812.3 Materials. Concrete shall have a 28-day specified compressive strength (f'_c) of not less than 2,500 psi (17.24 MPa). Where concrete is placed through a funnel hopper at the top of the pier, the concrete mix shall be designed and proportioned so as to produce a cohesive workable mix having a slump of not less than 4 inches (102 mm) and not more than 6 inches (152 mm). Where concrete is to be pumped, the mix design including slump shall be adjusted to produce a pumpable concrete.

1812.5 Concrete placement. Concrete shall be placed in such a manner as to ensure the exclusion of any foreign matter and to secure a full-sized shaft. Concrete shall not be placed through water except where a tremie or other approved method is used. When depositing concrete from the top of the pier, the concrete shall not be chuted directly into the pier but shall be poured in a rapid and continuous operation through a funnel hopper centered at the top of the pier.

1812.8 Concrete. Where adequate lateral support is not provided, and the unsupported height to least lateral dimension does not exceed three, piers of plain concrete shall be designed and constructed as pilasters in accordance with ACI 318. Where the unsupported height to least lateral dimension exceeds three, piers shall be constructed of reinforced concrete, and shall conform to the requirements for columns in ACI 318.

Exception: Where adequate lateral support is furnished by the surrounding materials as defined in Section 1808.2.9, piers are permitted to be constructed of plain or reinforced concrete. The requirements of ACI 318 for bearing on concrete shall apply.

1812.9 Steel shell. Where concrete piers are entirely encased with a circular steel shell, and the area of the shell steel is considered reinforcing steel, the steel shall be protected under the conditions specified in Section 1808.2.17. Horizontal joints in the shell shall be spliced to comply with Section 1808.2.7.

1812.10 Dewatering. Where piers are carried to depths below water level, the piers shall be constructed by a method that will provide accurate preparation and inspection of the bottom, and the depositing or construction of sound concrete or other masonry in the dry.

Committee Action:

Approved as Modified

Modify proposal as follows:

1810.3.1.2 Composite elements. Where a single deep foundation element comprises two or more sections of different materials or different types spliced together, each section of the composite assembly shall satisfy the applicable requirements of this code, and the maximum allowable load in each section shall be limited by the structural capacity of the weakest that section.

**TABLE 1810.3.2.6
ALLOWABLE STRESSES FOR MATERIALS USED IN DEEP FOUNDATION ELEMENTS**

MATERIAL TYPE AND CONDITION	MAXIMUM ALLOWABLE STRESS ^a
1. Concrete or grout in compression ^b Cast-in-place with a permanent casing in accordance with Section 1810.3.2.7 Cast-in-place in a pipe, tube, or other permanent casing, <u>or rock</u> Cast-in-place without a permanent casing Precast nonprestressed Precast prestressed	0.4 f'_c 0.33 f'_c 0.3 f'_c 0.33 f'_c 0.33 f'_c - 0.27 f_{pc}
2. Nonprestressed reinforcement in compression	0.4 $f_y \leq 30,000$ psi
3. Structural steel in compression Cores within concrete-filled pipes or tubes Pipes, tubes, or H-piles, where justified in accordance with Section 1810.3.2.8 Pipes or tubes for micropiles Other pipes, tubes, or H-piles	0.5 $F_y \leq 32,000$ psi 0.5 $F_y \leq 32,000$ psi 0.4 $F_y \leq 32,000$ psi 0.35 $F_y \leq 16,000$ psi
4. Nonprestressed reinforcement in tension Within micropiles Other conditions	0.6 f_y 0.5 $f_y \leq 24,000$ psi
5. Structural steel in tension Pipes, tubes, or H-piles, where justified in accordance with Section 1810.3.2.8 Other pipes, tubes, or H-piles	0.5 $F_y \leq 32,000$ psi 0.35 $F_y \leq 16,000$ psi
6. Timber	In accordance with the AF&PA NDS

- a. f'_c is the specified compressive strength of the concrete or grout; f_{pc} is the compressive stress on the gross concrete section due to effective prestress forces only; f_y is the specified yield strength of reinforcement; F_y is the specified minimum yield stress of structural steel.
- b. The stresses specified apply to the gross cross-sectional area within the concrete surface. Where a temporary or permanent casing is used, the inside face of the casing shall be considered the concrete surface.

1810.3.2.7 Increased allowable compressive stress for cased cast-in-place elements. The allowable compressive stress in the concrete shall be permitted to be increased as specified in Table 1810.3.2.6 for those portions of permanently cased cast-in-place elements that satisfy all of the following conditions:

- The design shall not use the casing to resist any portion of the axial load imposed.
- The casing shall have a sealed tip and be mandrel driven.
- The thickness of the casing shall not be less than manufacturer's standard gage No. 14 (0.068 inch) (1.75 mm).
- The casing shall be seamless or provided with seams of strength equal to the basic material and be of a configuration that will provide confinement to the cast-in-place concrete.
- The ratio of steel yield strength (F_y) to specified compressive strength (f'_c) shall not be less than six.
- The nominal diameter of the element shall not be greater than 16 inches (406 mm).

1810.3.3.1 Allowable axial load. The allowable axial load on a deep foundation element shall be determined in accordance with Sections 1810.3.3.1.1 through 1810.3.3.1.8.

1810.3.3.1.4 Allowable frictional resistance. The assumed frictional resistance developed by any uncased cast-in-place deep foundation element shall not exceed one-sixth of the bearing value of the soil material at minimum depth as set forth in Table 4804.2 1806.2, up to a maximum of 500 psf (24 kPa), unless a greater value is allowed by the building official on the basis of a soil investigation as specified in Section 1802 is submitted or a greater value is substantiated by a load test in accordance with Section 1810.3.3.1.2. Frictional resistance and bearing resistance shall not be assumed to act simultaneously unless recommended by a soil investigation as specified in Section 1802.

1810.3.5.2.3 Micropiles. Micropiles shall have an outside diameter of 12 inches (305 mm) or less. ~~There is no minimum diameter for micropiles. The minimum diameter set forth elsewhere in Section 1810.3.5 shall not apply to micropiles.~~

1810.3.6 Splices. Splices shall be constructed so as to provide and maintain true alignment and position of the component parts of the deep foundation element during installation and subsequent thereto and shall be ~~of adequate strength designed to transmit the vertical and lateral loads resist the axial and shear forces~~ and moments occurring at the location of the splice during driving and ~~for design load combinations under service loading~~. Where deep foundation elements of the same type are being spliced, splices shall develop not less than 50 percent of the bending strength of the weaker section. Where deep foundation elements of different materials or different types are being spliced, splices shall develop the full compressive strength and not less than 50 percent of the tension and bending strength of the weaker section. Where structural steel cores are to be spliced, the ends shall be milled or ground to provide full contact and shall be full-depth welded.

Splices occurring in the upper 10 feet (3048 mm) of the embedded portion of an element shall be ~~capable of designed to resisting~~ at allowable working stresses the moment and shear that would result from an assumed eccentricity of the axial load of 3 inches (76 mm), or the element shall be braced in accordance with Section 1810.2.2 to other deep foundation elements that do not have splices in the upper 10 feet (3048 mm) of embedment.

1810.3.10.1 [Supp] Construction. Micropiles shall develop their load-carrying capacity by means of a bond zone in soil, bedrock or a combination of soil and bedrock. Micropiles shall be grouted and have either a steel pipe or tube or steel reinforcement at every section along the length. It shall be permitted to transition from deformed reinforcing bars to steel pipe or tube reinforcement by extending the bars into the pipe or tube section by at least their tension development length in accordance with ACI 318.

1810.4.8 Hollow-stem augered, cast-in-place elements. Where concrete or grout is placed by pumping through a hollow-stem auger, the auger shall be permitted to rotate in a clockwise direction during withdrawal. ~~As the auger is shall be withdrawn at a steady rate or in increments not to exceed 1 foot (305 mm), in continuous increments.~~ concreting or grouting pumping pressures shall be measured and maintained high enough at all times to offset hydrostatic and lateral earth pressures. Concrete or grout volumes shall be measured to ensure that the volume of concrete or grout placed in each element is equal to or greater than the theoretical volume of the hole created by the auger. Where the installation process of any element is interrupted or a loss of concreting or grouting pressure occurs, the element shall be redrilled to 5 feet (1524 mm) below the elevation of the tip of the auger when the installation was interrupted or concrete or grout pressure was lost and reformed. Augered cast-in-place elements shall not be installed within six diameters center to center of an element filled with concrete or grout less than 12 hours old, unless approved by the building official. If the concrete or grout level in any completed element drops due to installation of an adjacent element, the element shall be replaced.

(Portions of proposal not shown remain unchanged)

Committee Reason: This proposal is part of the coordinated series of Chapter 18 reformatting code changes. It provides a necessary reorganization regarding deep foundations and fills in some holes in the current requirements. The modification provides correlation with section numbers resulting from the action taken on S147-07/08 and makes the terminology consistent throughout these sections. The modification of Section 1810.3.1.2 clarifies the assessment of composite deep foundation element. The modification to Section 1810.4.8 allows grout as well as concrete in hollow-stem augered elements.

Assembly Action:

None

Final Hearing Results

S160-07/08

AM

Code Change No: S161-07/08

Original Proposal

Section: 1808.2.8.5

Proponent: Edwin T. Huston, Smith & Huston, Inc., representing National Council of Structural Engineering Associations

Revise as follows:

1808.2.8.5 Uplift capacity. Where required by the design, the uplift capacity of a single pier or pile shall be determined by an approved method of analysis based on a minimum factor of safety of three or by load tests conducted in accordance with ASTM D 3689. The maximum allowable uplift load shall not exceed the ultimate load capacity as determined in Section 1808.2.8.3 divided by a factor of safety of two.

Exception: Where uplift is due to wind or seismic loading, the minimum factor of safety shall be 2 where capacity is determined by analysis and 1.5 where capacity is determined by load tests.

For pile groups subjected to uplift, the allowable working uplift load for the group shall be the lesser of:

1. The proposed individual pile uplift working load times the number of piles in the group.
2. Two-thirds of the effective weight of the pile group and the soil contained within a block defined by the perimeter of the group and the length of the pile.

Reason: Code update and consistency. Changes the required factor of safety for uplift where uplift is due to wind or seismic loading. The revision is generally consistent with the long-standing practice of permitting wind or seismic loads that are four-thirds of those for sustained loads.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: This code change adds an exception for the uplift capacity for wind and seismic effects that is consistent with current practice.

Assembly Action:

None

Final Hearing Results

S161-07/08

AS

Code Change No: **S162-07/08**

Original Proposal

Section: 1808.2.8.5

Proponent: Edwin T. Huston, Smith & Huston, Inc., representing National Council of Structural Engineering Associations

Revise as follows:

1808.2.8.5 Uplift capacity. Where required by the design, the uplift capacity of a single pier or pile shall be determined by an approved method of analysis based on a minimum factor of safety of three or by load tests conducted in accordance with ASTM D 3689. The maximum allowable uplift load shall not exceed the ultimate load capacity as determined in Section 1808.2.8.3, using the results of load tests conducted in accordance with ASTM D 3689, divided by a factor of safety of two. For pile groups subjected to uplift, the allowable working uplift load for the group shall be calculated by an approved method of analysis. Where the deep foundation elements in the group are placed at a spacing of at least 2.5 times the least horizontal dimension of the largest single element, the allowable working uplift load for the group is permitted to be calculated as the lesser of:

1. The proposed individual pile uplift working load times the number of piles in the group.
2. Two-thirds of the effective weight of the pile group and the soil contained within a block defined by the perimeter of the group and the length of the pile.

Reason: Code clarification and update. Clarifies the safety factor applied to results of load tests in accordance with ASTM D 3689. Allows more precise calculation of uplift capacity.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Modified

Modify proposal as follows:

1808.2.8.5 Uplift capacity. Where required by the design, the uplift capacity of a single pier or pile shall be determined by an approved method of analysis based on a minimum factor of safety of three or by load tests conducted in accordance with ASTM D 3689. The maximum allowable uplift load shall not exceed the ultimate load capacity as determined in Section 1808.2.8.3, using the results of load tests conducted in accordance with ASTM D 3689, divided by a factor of safety of two. For pile groups subjected to uplift, the allowable working uplift load for the group shall be calculated by an approved method of analysis. Where the deep foundation elements in the group are placed at a center-to-center spacing of at least 2.5 times the least horizontal dimension of the largest single element, the allowable working uplift load for the group is permitted to be calculated as the lesser of:

1. The proposed individual pile uplift working load times the number of piles in the group.
2. Two-thirds of the effective weight of the pile group and the soil contained within a block defined by the perimeter of the group and the length of the pile.

Committee Reason: This proposal provides a limitation on the use of the provision to determine uplift capacity of a pile. The modification makes a clarification regarding the minimum pile spacing.

Assembly Action:

None

Final Hearing Results

S162-07/08

AM

Code Change No: **S163-07/08**

Original Proposal

Section: 1808.2.8.8

Proponent: Edwin T. Huston, Smith & Huston, Inc., representing National Council of Structural Engineering Associations

Revise as follows:

1808.2.8.8 Overloads on piers or piles. The foundation or superstructure shall be designed to resist the effects of the mislocation of any deep foundation element by no less than 3 inches (76 mm). The maximum compressive load on any pier or pile due to mislocation shall not exceed 110 percent of the allowable design load.

Reason: Code update and consistency. Proper design of deep foundations must recognize the significance of permitted construction tolerances. The effects of mislocation are recognized in the current text of Chapter 18 in Section 1808.2.8.8 (which permits slight overload due to mislocation) and Section 1808.2.7 (which requires that splices be designed for accidental eccentricity). This change formalizes the requirement to consider mislocation. The effects of mislocation can be resisted by flexure and axial load in vertical deep foundation elements, flexure in pile caps, or resistance in the superstructure above. This proposed change permits any of these approaches.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: This change gives the designer a necessary notification to consider the effects of mislocation of piles or piers. This will make designs conform to normal construction tolerances.

Assembly Action:

None

Final Hearing Results

S163-07/08

AS

Code Change No: **S164-07/08**

Original Proposal

Section: 1808.2.9.2

Proponent: Edwin T. Huston, Smith & Huston, Inc., representing National Council of Structural Engineering Associations

Revise as follows:

1808.2.9.2 Unbraced piles. Piles standing unbraced in air, water or in fluid soils shall be designed as columns in accordance with the provisions of this code. Such piles driven into firm ground can be considered fixed and laterally supported at 5 feet (1524 mm) below the ground surface and in soft material at 10 feet (3048 mm) below the ground surface unless otherwise approved prescribed by the building official on the basis of after a foundation geotechnical investigation by a registered design professional an approved agency.

Reason: Code update. Revises the process to be consistent with practice. Building officials do not prescribe the depth of embedment needed for lateral support; they approve such depths on the basis of geotechnical investigations.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: This aligns the code provision to be more consistent with current practice for unbraced piles.

Assembly Action:

None

Final Hearing Results

S164-07/08

AS

Code Change No: **S165-07/08**

Original Proposal

Section: 1808.2.9.2

Proponent: Edwin T. Huston, Smith & Huston, Inc., representing National Council of Structural Engineering Associations

Revise as follows:

1808.2.9.2 Unbraced piles. Piles standing unbraced in air, water or in fluid soils shall be designed as columns in accordance with the provisions of this code. Such piles driven into firm ground can be considered ~~fixed and~~ laterally supported at 5 feet (1524 mm) below the ground surface and in soft material at 10 feet (3048 mm) below the ground surface unless otherwise prescribed by the building official after a foundation investigation by an approved agency.

Reason: Code update. Fixity should be considered explicitly as is common in practice. Explicit consideration of fixity may be based on formulas and charts from the literature (such as in NAVFAC design manuals) or on p-y analysis (using LPILE or similar programs).

While it is reasonable to assume that piles are laterally supported where embedded in firm or soft soil, it is not reasonable to assume them to have flexural fixity with the distances of embedment indicated. Firm and soft soil conditions vary considerably. Also, the stiffness of the deep foundation element plays a critical role in assessing fixity. For typical deep foundation elements with diameters of 14 to 48 inches in soil profiles associated with Site Classes A, B, C, D, and E, the depth to fixity may vary from a low of about 3 feet to a high of about 20 feet.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: This item clarifies the intent of the provision for unbraced piles. The consideration of pile fixity would be considered normal practice in evaluating lateral restraint.

Assembly Action:

None

Final Hearing Results

S165-07/08

AS

Code Change No: **S166-07/08**

Original Proposal

Sections: 1808.2.9.3, 1808.2.12

Proponent: Edwin T. Huston, Smith & Huston, Inc., representing National Council of Structural Engineering Associations

Revise as follows:

1808.2.9.3 Allowable lateral load. Where required by the design, the lateral load capacity of a pier, a single pile or a pile group shall be determined by an approved method of analysis or by lateral load tests to at least twice the proposed design working load. The resulting allowable load shall not be more than one-half of the that test load that produces a gross lateral movement of 1 inch (25 mm) at the lower of the top of foundation element and the ground surface, unless it can be shown that the predicted lateral movement shall cause neither harmful distortion of, nor instability in, the structure, nor cause any element to be loaded beyond its capacity.

1808.2.12 Settlement analysis. The settlement of piers, individual piles or groups of piles shall be estimated based on approved methods of analysis. The predicted settlement shall cause neither harmful distortion of, nor instability in, the structure, nor cause any element to be loaded beyond its capacity ~~stresses to exceed allowable values.~~

Reason: Code clarification and update. Clarifies that the lateral drift criterion applies to both analysis and testing. Allows demonstration of different lateral drift criteria in a manner similar to that for settlement. Revises the text related to settlement for better consistency with modern design techniques (which are not limited to allowable stress design).

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: This proposal clarifies determination of pile lateral capacity by providing guidance with respect to the lateral movement criterion.

Assembly Action:

None

Final Hearing Results

S166-07/08

AS

Code Change No: S167-07/08

Original Proposal

Sections: 1808.2.10, 1810.3.2, 1810.4.2

Proponent: Edwin T. Huston, Smith & Huston, Inc., representing National Council of Structural Engineering Associations

Revise as follows:

1808.2.10 Use of higher allowable pier or pile stresses. Allowable stresses greater than those specified for piers or for each pile type in Sections 1809 and 1810 are permitted where supporting data justifying such higher stresses is filed with the building official. Such substantiating data shall include:

1. A soils investigation in accordance with Section 1802.
2. Pier or pile load tests in accordance with Section 1808.2.8.3, regardless of the load supported by the pier or pile.

The design and installation of the pier or pile foundation shall be under the direct supervision of a registered design professional knowledgeable in the field of soil mechanics and pier or pile foundations who shall ~~certify~~ submit a report to the building official stating that the piers or piles as installed satisfy the design criteria.

1810.3.2 Dimensions. The pile length shall not exceed 30 times the average diameter. The minimum diameter shall be 12 inches (305 mm).

Exception: The length of the pile is permitted to exceed 30 times the diameter, provided that the design and installation of the pile foundation are under the direct supervision of a registered design professional knowledgeable in the field of soil mechanics and pile foundations. The registered design professional shall ~~certify~~ submit a report to the building official stating that the piles were installed in compliance with the approved construction documents.

1810.4.2 Dimensions. The pile length shall not exceed 30 times the average diameter. The minimum diameter shall be 12 inches (305 mm).

Exception: The length of the pile is permitted to exceed 30 times the diameter, provided that the design and installation of the pile foundation is under the direct supervision of a registered design professional knowledgeable in the field of soil mechanics and pile foundations. The registered design professional shall ~~certify~~ submit a report to the building official stating that the piles were installed in compliance with the approved design.

Reason: For legal and professional practice reasons, changes requirements for registered design professional to "certify" to "report".

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: This proposal appropriately replaces the term certify with a requirement to submit reports, since certify often means sealing by a register design professional under state law.

Assembly Action:

None

Final Hearing Results

S167-07/08

AS

Code Change No: **S168-07/08**

Original Proposal

Section: 1808.2.23.1.1

Proponent: Edwin T. Huston, Smith & Huston, Inc., representing National Council of Structural Engineering Associations

Revise as follows:

1808.2.23.1.1 Connection to pile cap. Concrete piles and concrete-filled steel pipe piles shall be connected to the pile cap by embedding the pile reinforcement or field-placed dowels anchored in the concrete pile in the pile cap for a distance equal to the development length. For deformed bars, the development length is the full development length for compression or tension, in the case of uplift, without reduction in length for excess area. Alternative measures for laterally confining concrete and maintaining toughness and ductile-like behavior at the top of the pile will be permitted provided the design is such that any hinging occurs in the confined region.

Ends of hoops, spirals and ties shall be terminated with seismic hooks, as defined in Section 21.1 of ACI 318, turned into the confined concrete core. The minimum transverse steel ratio for confinement shall not be less than one-half of that required for columns.

For resistance to uplift forces, anchorage of steel pipe (round HSS sections), concrete-filled steel pipe or H-piles to the pile cap shall be made by means other than concrete bond to the bare steel section.

Exception: Anchorage of concrete-filled steel pipe piles is permitted to be accomplished using deformed bars developed into the concrete portion of the pile.

Splices of pile segments shall develop the full strength of the pile, but the splice need not develop the nominal strength of the pile in tension, shear and bending when it has been designed to resist axial and shear forces and moments from the load combinations of Section 1605.4.

Where this chapter requires detailing of concrete deep foundation elements in accordance with Section 21.4.4.1 of ACI 318, compliance with Equation (10-5) of ACI 318 shall not be required.

Reason: Relaxes an overly restrictive code requirement. Proper design for deep foundation elements differs from that for columns in several respects.

First, axial compression is severely limited by the capacity of the soil-foundation interface (as reflected by code limits to a small fraction of the concrete compressive strength). The purpose of ACI 318 Equation (10-5) is to provide significant residual compressive strength for concentrically loaded spiral columns subjected to very large axial compression.

“ACI 318 Section R10.9.3 — The effect of spiral reinforcement in increasing the load-carrying strength of the concrete within the core is not realized until the column has been subjected to a load and deformation sufficient to cause the concrete shell outside the core to spall off. The amount of spiral reinforcement required by Eq. (10-5) is intended to provide additional load-carrying strength for concentrically loaded columns equal to or slightly greater than the strength lost when the shell spalls off.”

Second, the concern driving transverse confinement reinforcement for deep foundations is flexural ductility. The commentary to ACI 318 explains both the reason to provide confinement reinforcement for deep foundation elements and the result achieved by compliance with Equation (21-2).

“R21.10.4.4 — During earthquakes, piles can be subjected to extremely **high flexural demands** at points of discontinuity, especially just below the pile cap and near the base of a soft or loose soil deposit. The 1999 code requirement for confinement reinforcement at the top of the pile is based on numerous failures observed at this location in recent earthquakes. Transverse reinforcement is required in this region to provide **ductile performance**. ...”

“ACI 318 R21.4.4 — ... Eq. (21-2) and (21-4) govern for large-diameter columns, and are intended to **ensure adequate flexural curvature capacity in yielding regions**.”

Third, the concrete cover required for uncased deep foundation elements is much greater than that for columns. As a result, application of Eq. (10-5) to deep foundation elements results in amounts of transverse reinforcement that are unwarranted and often un-placable as shown in the comparison below. The calculations use typical material properties, bar sizes, and minimum cover and also illustrate the effect of the permitted reduction in transverse reinforcement ratio for Site Classes A, B, C, and D. It can be seen that application of Eq. (10-5) produces transverse reinforcement spacing that is difficult or even impossible to implement (even where the reduction applies). The problem is especially pronounced for small diameter elements as the ratio of gross area to core area results in Eq. (10-5) controlling by a factor of 5 to 8. Where those elements are augercast (as is often the case for small diameter uncased cast-in-place deep foundations) it is nearly impossible to place properly a reinforcement cage with #5 spiral at 2.5" o.c.

f_c = 5 ksi
 f_y = 60 ksi
 cover = 2.5 inch
 Site Class = E (no reduction)

Diameter D	1.0 x min ρ _s			max spcg*	A _{s,reqd} at max spcg		Spcg for #3		Spcg for #4		Spcg for #5	
	(21-2)	(10-5)	ratio		(21-2)	(10-5)	(21-2)	(10-5)	(21-2)	(10-5)	(21-2)	(10-5)
12"	0.010	0.073	7.27	3	0.05	0.38	[3.0"]	0.9"	[3.0"]	1.6"	[3.0"]	2.4"
14"	0.010	0.053	5.32	3.5	0.08	0.42	[3.5"]	0.9"	[3.5"]	1.7"	[3.5"]	2.6"
16"	0.010	0.042	4.18	4	0.11	0.46	[4.0"]	1.0"	[4.0"]	1.7"	[4.0"]	2.7"
18"	0.010	0.034	3.44	4.5	0.15	0.50	3.4"	1.0"	[4.5"]	1.8"	[4.5"]	2.8"
20"	0.010	0.029	2.92	4.5	0.17	0.49	2.9"	1.0"	[4.5"]	1.8"	[4.5"]	2.8"
22"	0.010	0.025	2.53	5.5	0.23	0.59	2.6"	1.0"	4.7"	1.9"	[5.5"]	2.9"
24"	0.010	0.022	2.23	6	0.29	0.64	2.3"	1.0"	4.2"	1.9"	[6.0"]	2.9"
26"	0.010	0.020	2.00	6	0.32	0.63	2.1"	1.0"	3.8"	1.9"	5.9"	3.0"
28"	0.010	0.018	1.81	6	0.35	0.62	1.9"	1.1"	3.5"	1.9"	5.4"	3.0"
30"	0.010	0.017	1.65	6	0.38	0.62	1.8"	1.1"	3.2"	1.9"	5.0"	3.0"
32"	0.010	0.015	1.52	6	0.41	0.61	1.6"	1.1"	3.0"	2.0"	4.6"	3.0"
34"	0.010	0.014	1.40	6	0.44	0.61	1.5"	1.1"	2.8"	2.0"	4.3"	3.0"
36"	0.010	0.013	1.31	6	0.47	0.61	1.4"	1.1"	2.6"	2.0"	4.0"	3.1"

*#6 bars; #8 for D > 20"

maximum spacing controls bracketed values

f_c = 4 ksi
 f_y = 60 ksi
 cover = 2.5 inch
 Site Class = D (reduction permitted)

Diameter D	0.5 x min ρ _s			max spcg*	A _{s,reqd} at max spcg		Spcg for #3		Spcg for #4		Spcg for #5	
	(21-2)	(10-5)	ratio		(21-2)	(10-5)	(21-2)	(10-5)	(21-2)	(10-5)	(21-2)	(10-5)
12"	0.004	0.029	7.27	3	0.02	0.15	[3.0"]	2.2"	[3.0"]	[3.0"]	[3.0"]	[3.0"]
14"	0.004	0.021	5.32	3.5	0.03	0.17	[3.5"]	2.3"	[3.5"]	[3.5"]	[3.5"]	[3.5"]
16"	0.004	0.017	4.18	4	0.04	0.18	[4.0"]	2.4"	[4.0"]	[4.0"]	[4.0"]	[4.0"]
18"	0.004	0.014	3.44	4.5	0.06	0.20	[4.5"]	2.5"	[4.5"]	4.5"	[4.5"]	[4.5"]
20"	0.004	0.012	2.92	4.5	0.07	0.20	[4.5"]	2.5"	[4.5"]	[4.5"]	[4.5"]	[4.5"]
22"	0.004	0.010	2.53	5.5	0.09	0.24	[5.5"]	2.6"	[5.5"]	4.6"	[5.5"]	[5.5"]
24"	0.004	0.009	2.23	6	0.11	0.25	5.8"	2.6"	[6.0"]	4.7"	[6.0"]	[6.0"]
26"	0.004	0.008	2.00	6	0.13	0.25	5.2"	2.6"	[6.0"]	4.8"	[6.0"]	[6.0"]
28"	0.004	0.007	1.81	6	0.14	0.25	4.8"	2.6"	[6.0"]	4.8"	[6.0"]	[6.0"]
30"	0.004	0.007	1.65	6	0.15	0.25	4.4"	2.7"	[6.0"]	4.8"	[6.0"]	[6.0"]
32"	0.004	0.006	1.52	6	0.16	0.25	4.1"	2.7"	[6.0"]	4.9"	[6.0"]	[6.0"]
34"	0.004	0.006	1.40	6	0.17	0.24	3.8"	2.7"	[6.0"]	4.9"	[6.0"]	[6.0"]
36"	0.004	0.005	1.31	6	0.19	0.24	3.5"	2.7"	[6.0"]	4.9"	[6.0"]	[6.0"]

*#6 bars; #8 for D > 20"

maximum spacing controls bracketed values

In a related proposal Section 1808.2.12.1.1 is split up and reorganized. Should both proposals be accepted this new text is intended to appear as Section 1810.3.2.1.2 with the title "ACI 318 Equation (10-5)."

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: This makes a necessary correction to the code requirements for deep foundations by relaxing an overly restrictive code requirement, because pile capacity is controlled by soil confinement rather than concrete spalling.

Assembly Action:

None

Final Hearing Results

S168-07/08

AS

Code Change No: S169-07/08

Original Proposal

Section: 1810.1.1

Proponent: Edwin T. Huston, Smith & Huston, Inc., representing National Council of Structural Engineering Associations

Revise as follows:

1810.1.1 Materials. Concrete shall have a 28-day specified compressive strength (f'_c) of not less than 2,500 psi (17.24 MPa). Where concrete is placed through a funnel hopper at the top of the pile, the concrete mix shall be designed and proportioned so as to produce a cohesive workable mix having a slump of not less than 4 inches (102 mm) and not more than ~~6 8~~ inches (~~152 204~~ mm). Where concrete is to be pumped, the mix design including slump shall be adjusted to produce a pumpable concrete.

Reason: Code update. Section 2.4.3 of ACI 336.1-01 (Specification for the Construction of Drilled Piers) specifies a slump of 4 to 6 inches for dry method placement uncased or with permanent casing and 6 to 8 inches for dry method placement with temporary casing. Since both methods of placement are permitted by the IBC, the range of permitted slumps should be stated accordingly.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: This proposal corrects an oversight by expanding the range of permitted concrete slumps in drilled piers to match current practice.

Assembly Action:

None

Final Hearing Results

S169-07/08

AS

Code Change No: S170-07/08

Original Proposal

Sections: 1810.7.1, 1810.7.4

Proponent: Edwin T. Huston, Smith & Huston, Inc., representing Council of Structural Engineering Associations

Revise as follows:

1810.7.1 Construction. Caisson piles shall consist of a shaft section of concrete-filled pipe extending to bedrock with an uncased socket drilled into the bedrock and filled with concrete. The caisson pile shall have reinforcement or a full-length structural steel core for the length as indicated by an approved method of analysis, or a stub core installed in the rock socket and extending into the pipe portion a distance equal to the socket depth.

1810.7.4 Structural core. Where a structural steel core is used, The gross cross-sectional area of the ~~structural steel core~~ shall not exceed 25 percent of the gross area of the caisson. The minimum clearance between the structural core and the pipe shall be 2 inches (51 mm). Where cores are to be spliced, the ends shall be milled or ground to provide full contact and shall be full-depth welded.

Reason: Code update and consistency. Socketed drilled shafts often employ reinforcement instead of structural core sections. This common construction is widely acknowledged. For instance, ACI 336.3 (Design and Construction of Drilled Piers) reads as follows:

“3.6-- Piers socketed in rock

This type of pier is socketed into rock to a depth of one to six times the diameter of the pier for the purpose of developing high service loading capacity. The drilled pier consists of a heavy wall permanent casing fitted with a cutting shoe and seated into the top of rock. A steel core or heavy reinforcing cage is encased in the concrete which extends into the rock socket. A column cap is designed to transfer loads from the superstructure to one or more rock socketed piers. The pier is designed to support all load in the rock.”

Analysis is required to determine the appropriate distance to extend reinforcement or a structural steel core from the socket into the pipe or tube casing.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: This code change updates requirements for drilled piers to match industry practice. The use of reinforcement rather than a structural core is widely acknowledged.

Assembly Action:

None

Final Hearing Results

S170-07/08

AS

Code Change No: S171-07/08

Original Proposal

Sections: 1818.1, 1813 (New)

Proponent: Robert M. Hoyt, Hoyt Engineering, PC, Representing Deep Foundations Institute Committee on Helical Foundations and Tiebacks, Deep Foundations Institute

1. Add new test as follows:

1808.1 Definitions. The following words and terms shall, for the purposes of this section, have the meanings shown herein.

PILE FOUNDATIONS. Pile foundations consist of concrete, wood or steel structural elements either driven into the ground or cast in place. Piles are relatively slender in comparison to their length, with lengths exceeding 12 times the least horizontal dimension. Piles derive their load-carrying capacity through skin friction, end bearing or a combination of both.

HELICAL PILE. Manufactured steel foundation pile consisting of a central shaft and one or more helical bearing plates. A helical pile is installed by rotating into the ground. Each helical bearing plate is formed into a screw thread with a uniform defined pitch.

**SECTION 1813
HELICAL PILE FOUNDATIONS**

1813.1 General. Helical pile foundations shall conform to the requirements of Sections 1813.2 through 1813.7.

1813.2 Dimensions. Dimensions of the central shaft and the number, size and thicknesses of helical bearing plates shall be sufficient to support the service loads, as listed in an ICC-ES evaluation report or as determined by a licensed design professional experienced in geotechnical engineering and the design of foundations utilizing helical piles.

1813.3 Design and manufacture. Helical piles shall be designed and manufactured in accordance with accepted engineering practice to resist all stresses induced by installation into the ground and service loads. When compliance of helical piles with Section 1813.2 is based on an ICC-ES evaluation, a copy of the evaluation report shall be provided to the building department.

1813.4 Allowable stresses. The allowable design stress, F_a , in the steel components of the pile shall not exceed the least value of the following:

$$F_a = 0.6 F_y \text{ or } 0.5 F_u \quad \text{(Equation 18-11)}$$

where:

F_y = yield strength of the steel

F_u = ultimate strength of the steel

1813.5 Allowable loads

1813.5.1 Allowable axial load. The allowable axial design load, Q_a , of helical piles shall be limited to the least value associated with the interaction of the pile with the soil, the strength of the pile shaft, the strength of the shaft couplings, the strength of the helical bearing plates, or the strength of the joint between the helical bearing plates and the shaft, as listed in an ICC-ES evaluation report or as determined by a licensed design professional experienced in such evaluations.

1813.5.2 Allowable lateral load. The allowable lateral design load, P_a , of helical piles shall be limited to the least value associated with the interaction of the pile with the soil, the strength of the pile shaft, or the strength of the shaft couplings, as listed in an ICC-ES evaluation report or as determined by a licensed design professional experienced in such evaluations of helical piles.

1813.6 Special inspection. Special inspections in accordance with Section 1704.8 are required, as prescribed in Section 1808.2.22. The records submitted to the building official shall include, in addition to the records specified in 1704.8, installation equipment used; pile shaft dimensions, helix configuration and material grades; torsional resistance vs. embedment length; and such other installation data as the special inspector may deem appropriate.

1813.7 Installation. Helical piles shall be installed to specified embedment depth and torsional resistance criteria as stated in an applicable ICC-ES evaluation report or as determined by a licensed design professional experienced in geotechnical engineering and the design of foundations utilizing helical piles. The torque applied during installation shall not exceed the maximum allowable installation torque of the helical pile as listed in an applicable ICC-ES evaluation report or, in the absence of such a report, as recommended by the helical pile manufacturer.

Reason: The purpose of this proposal is to add provisions addressing the design and installation of helical pile foundations. Helical piles are not currently listed and their design and installation are not currently addressed in the Code. Helical pile foundations are becoming more and more common in civil construction. Proposed new Section 1813 contains specifications for the design and installation of helical pile foundations. The section will extend the coverage of the code to an increasingly popular but currently un-regulated type of deep foundation. The proposed definition, design and installation provisions conform to newly adopted ICC-ES AC358.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The proposal to add helical pile foundations to Chapter 18 is a good concept and the committee has no objection in principle. The language used, such as references to ICC-ES evaluation reports, is an indicator that this change needs work. The committee recommends submitting a public comment with a modified proposal.

Assembly Action:

None

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because public comments were submitted.

Public Comment:

Commenter-s Reason: As stated in the floor modification submitted during the hearing, design engineers and building officials are in great need of a code standard and guide line for evaluating helical piles.

Commenter's Reason: Eliminates inappropriate references to ICC-ES documents, while making the requirements consistent therewith. Locates special inspection requirements in Chapter 17, and presents those requirements in a manner consistent with that for other foundations systems. Coordinates with the NCSEA proposals that totally reorganize Chapter 18.

Commenter's Reason- Buchanan, Craig, Davidson and Gray: As stated in the floor modification submitted during the hearing, design engineers and building officials are in great need of a code standard and guide line for evaluating helical piles

Commenter's Reason – Bobbitt: Change language to eliminate reference to ICC documents and to simplify language.

Commenter-s Reason – Hermanson, Paap, Perko, Pinkleton, Shipman, John, and Shipman, Mary: Eliminates inappropriate references to ICC-ES documents, while making the requirements consistent therewith. Locates special inspection requirements in Chapter 17, and presents those requirements in a manner consistent with that for other foundations systems. Coordinates with the NCSEA proposals that totally reorganize Chapter 18.

Commenter-s Reason – Neal: Eliminates inappropriate references to ICC-ES documents, while making the requirements consistent therewith. Locates special inspection requirements in Chapter 17, and presents those requirements in a manner consistent with that for other foundations systems. Coordinates with the NCSEA proposals that totally reorganize Chapter 18.

Helical piers are a reliable and time tested deep foundations when installed by a certified installer. The system is virtually self-testing and provides predictable and reliable results when installed correctly. For these reasons requirements for this system should be consistent with code requirements or other foundation systems.

Melissa Bass, Thomas R. Moran Construction Company, Inc.
Darla Bates, RJT Commercial, LLC.
Ryan Bates, Thomas R. Moran Construction Company, Inc.
Albert Beane, Jr., Walder Foundation Products
Donald E. Bobbitt, PE, Consulting Engineer, Centralia MO, representing himself
Jodie Bonnette, Thomas R. Moran Construction Company, Inc.
Glenda Brady, Ram Jack Systems Distribution, LLC
Denise Brown, Basement Cracks and Leaks, Metro Inc
Robert Brown, Arizona Repair Masons Inc, representing Ram Jack Systems Distribution, LLC
Brian Buchanan, RJT Construction, LLC
Doug Burwell, Thomas R. Moran Construction Company, Inc.
Dewayne Craig, Arizona Ram Jack, LLC
Frank D'Angelo, D'Angelo Brothers, LLC
Ron Davidson, Ram Jack Systems Distribution, LLC
Brad Davis, Thomas R. Moran Construction Company, Inc.
Justin Dean, Atlas Foundation Company
Mitchell Dearth, Thomas R. Moran Construction Company, Inc.
Scott Erlewing, Ram Jack of South Carolina, Inc.
Richard W. Follett, Ram Jack of Ohio., representing Ram Jack Systems Distribution, LLC
Clark Gray, Ram Jack Systems Distribution, LLC
Darren Gregory, Ram Jack Systems Distribution, LLC.
George W. Haffert, Danbro Distributors
Randall Hart, Thomas R. Moran Construction Company, Inc.
Ben Hermanson, Structural Anchor Supply, Atlas Foundation Co.
Richard Hightower, Hightower Geotechnical Services, Inc.
Russ Howell, Thomas R. Moran Construction Company, Inc.
William R. Howell, Pacific Ram Jack
Christopher Huntley, Atlas Foundation Co., Rodgers MN
Michael Janish, Atlas Foundation Company
Robb Johnson, P.E., Engineering & Construction Innovations, Inc., representing himself
Terri King, LZB Inc., dba Earth Anchors
Scott Mackay, Ram Jack of the Tri States Inc
Tressa G. McGinty, Ram Jack Manufacturing, LLC
Michael Melworm, Premium Technical Services
Thomas Moran, Thomas R. Moran Construction Company, Inc.
Mamdouh Nasr, Advanced Geosolutions, Inc., representing Deep Foundation Institute
Frederick D. Neal, AIA, P.E. representing F.d. Neal Construction Ltd.
Mike O'Connor, Thomas R. Moran Construction Company, Inc.
Tom Osborne, T-OZ Construction, Inc

Ron Paap, Pacific Helix Distributing, Inc. So
 Howard Perko, Ph.D., P.E., CTL Thompson, Inc.
 Charles Gary Peterson, Peterson Structural Engineers
 Lea Ann Pharr, Ram Jack Systems Distribution, LLC
 Michael A. Pinkleton, Intech Anchoring Systems, Inc.
 Mike Pinley, Ram Jack Manufacturing LLC
 Danny Plaugher, Thomas R. Moran Construction Company, Inc.
 Delton Riehle, HiTech Foundations
 Joe Rainer, Thomas R. Moran Construction Company, Inc.
 Staci Ritchie, Thomas R. Moran Construction Company, Inc.
 Randy Robertson, Cyntech Corporation
 Mike Robinson, Thomas R. Moran Construction Company, Inc.
 Frank Russell, Integral Construction
 Luis M. Sanchez, Ram Jack of Virginia, Inc.
 Maria T. Sanchez, Ram Jack MD, requests
 Josh Sanders, Ram Jack Systems Distribution, LLC
 Francine Schauwecker, Ram Jack Foundation Solutions of East Tennessee and NW Georgia
 John Schauwecker, Ram Jack Foundation Solutions of East Tennessee and NW Georgia
 Scott Schauwecker, Ram Jack Foundation Solutions of East Tennessee and NW Georgia
 Bryan Schley, Custom Structures Foundation Systems, Inc.
 Josh Schofield, Thomas R. Moran Construction Company, Inc.
 Gary L. Seider, Hubbell Power Systems, representing Chance Civil Construction
 John L. Shipman, Ram Jack Systems Distribution LLC
 Mary M. Shipman, Ram Jack Systems Distribution LLC
 Darin Willis, P.E. Ram Jack Manufacturing LLC
 Brandon Smith, Thomas R. Moran Construction Company, Inc.
 Jason Strauss, Thomas R. Moran Construction Company, Inc.
 Danny Stephens, Thomas R. Moran Construction Company, Inc.
 Jeff Torson, LZB Inc., dba Earth Anchors
 Kevin Wallace, Thomas R. Moran Construction Company, Inc.
 Eric Walt, Atlas Foundation Company
 Darla Walters, Thomas R. Moran Construction Company, Inc.
 Paul Weingart, Atlas Foundation Company
 Lee Zumwalt, LZB, Inc., dba Earth Anchors

Replace proposal as follows:

1802.1 Definitions. The following words and terms shall, for the purposes of this chapter, have the meanings shown herein.

HELICAL PILE. Manufactured steel deep foundation element consisting of a central shaft and one or more helical bearing plates. A helical pile is installed by rotating it into the ground. Each helical bearing plate is formed into a screw thread with a uniform defined pitch.

1810.3.1 Design conditions. Design of deep foundations shall include the design conditions specified in Sections 1810.3.1.1 through ~~1810.3.1.5~~ 1810.3.1.6, as applicable.

1810.3.1.5 Helical Piles. Helical piles shall be designed and manufactured in accordance with accepted engineering practice to resist all stresses induced by installation into the ground and service loads.

[Renumber subsequent sections]

**TABLE 1810.3.2.6
 ALLOWABLE STRESSES FOR MATERIALS USED IN DEEP FOUNDATION ELEMENTS**

MATERIAL TYPE AND CONDITION	MAXIMUM ALLOWABLE STRESS ^a
3. Structural steel in compression Cores within concrete-filled pipes or tubes Pipes, tubes, or H-piles, where justified in accordance with Section 1810.3.2.8 Pipes or tubes for micropiles Other pipes, tubes, or H-piles <u>Helical piles</u>	$0.5 F_y \leq 32,000$ psi $0.5 F_y \leq 32,000$ psi $0.4 F_y \leq 32,000$ psi $0.35 F_y \leq 16,000$ psi $0.6 F_y \leq 0.5 F_u$
5. Structural steel in tension Pipes, tubes, or H-piles, where justified in accordance with Section 1810.3.2.8 Other pipes, tubes, or H-piles <u>Helical piles</u>	$0.5 F_y \leq 32,000$ psi $0.35 F_y \leq 16,000$ psi $0.6 F_y \leq 0.5 F_u$

(Portions of table not shown remain unchanged)

- a. f'_c is the specified compressive strength of the concrete or grout; f_{pc} is the compressive stress on the gross concrete section due to effective prestress forces only; f_y is the specified yield strength of reinforcement; F_y is the specified minimum yield stress of structural steel; F_u is the specified minimum tensile stress of structural steel.
- b. The stresses specified apply to the gross cross-sectional area within the concrete surface. Where a temporary or permanent casing is used, the inside face of the casing shall be considered the concrete surface.

1810.3.3.1 Allowable axial load. The allowable axial load on a deep foundation element shall be determined in accordance with Section 1810.3.3.1.1 through 1810.3.3.1.89.

1810.3.3.1.9 Helical piles. The allowable axial design load, P_a , of helical piles shall be determined as follows:

$$P_a = 0.5 P_u \quad \text{(Equation 18-4)}$$

where P_u is the least value of:

- P_u = sum of the areas of the helical bearing plates times the ultimate bearing capacity of the soil or rock comprising the bearing stratum
 P_u = ultimate capacity determined from well documented correlations with installation torque
 P_u = ultimate capacity determined from load tests
 P_u = ultimate axial capacity of pile shaft
 P_u = ultimate axial capacity of pile shaft couplings
 P_u = sum of the ultimate axial capacity of helical bearing plates affixed to pile

1810.3.5.3 Steel. Steel deep foundation elements shall satisfy the requirements of this section.

1810.3.5.3.3 Helical piles. Dimensions of the central shaft and the number, size and thicknesses of helical bearing plates shall be sufficient to support the design loads.

1810.4 Installation. Deep foundations shall be installed in accordance with Section 1810.4. Where a single deep foundation element comprises two or more sections of different materials or different types spliced together, each section shall satisfy the applicable conditions of installation.

1810.4.10 Helical piles. Helical piles shall be installed to specified embedment depth and torsional resistance criteria as determined by a registered design professional. The torque applied during installation shall not exceed the maximum allowable installation torque of the helical pile.

1810.4.4011 Special inspection. Special inspections in accordance with Sections 1704.8 and 1704.9 shall be provided for driven and cast-in-place deep foundation elements, respectively. Special inspections in accordance with Section 1704.10 shall be provided for helical piles.

2. Add new text as follows:

1704.10 Helical Pile Foundations. Special inspections shall be performed continuously during installation of helical pile foundations. The information recorded shall include installation equipment used, pile dimensions, tip elevations, final depth, final installation torque, and other pertinent installation data as required by the registered design professional in responsible charge. The approved geotechnical report and the documents prepared by the registered design professional shall be used to determine compliance.

[Renumber subsequent sections]

Final Hearing Results

S171-07/08

AMPC

Code Change No: **S172-07/08**

Original Proposal

Sections: 1904.2 (New), 1904.2.1, 1904.2.2, 1904.2.3, 1904.3, 1904.4, 1904.5 (New), 1907.7, 1907.7.1, 1907.7.2, 1907.7.3, 1907.7.4, 1907.7.5 (New), 1907.7.6, 1907.7.7, 1908, 1909.6.1, 1909.6.3, 1912.1, Table 1704.3, 1708.3

Proponent: Joseph J. Messersmith, Jr. PE, Portland Cement Association; Daniel Falconer, PE, American Concrete Institute

1. Add new text as follows:

1904.2 Exposure categories and classes. Concrete shall be assigned to exposure classes based on:

1. Exposure to freezing and thawing in a moist condition or deicer chemicals;
2. Exposure to sulfates in water or soil;
3. Exposure to water where the concrete is intended to have low permeability; and
4. Exposure to chlorides from deicing chemicals, salt, salt water, brackish water, seawater or spray from these sources, where the concrete has steel reinforcement.

2. Delete without substitution:

~~**1904.2 Freezing and thawing exposures.** Concrete that will be exposed to freezing and thawing, deicing chemicals or other exposure conditions as defined below shall comply with Sections 1904.2.1 through 1904.2.3.~~

~~**1904.2.1 Air entrainment.** Concrete exposed to freezing and thawing or deicing chemicals shall be air entrained in accordance with ACI 318, Section 4.2.1:~~

3. Revise as follows:

~~**1904.2.2**~~ **1904.3 (Supp) Concrete properties.** Concrete that will be subject to the following exposures mixtures shall conform to the ~~corresponding~~ most restrictive maximum water-cementitious materials ratios and minimum specified concrete compressive strength requirements of ACI 318, Section 4.2.2. ~~4.3;~~ based on the exposure classes assigned in Section 1904.2.

- ~~1. Concrete intended to have low permeability where exposed to water;~~
- ~~2. Concrete exposed to freezing and thawing in a moist condition or deicer chemicals; or~~
- ~~3. Corrosion protection of reinforcement in concrete exposed to chlorides from deicing chemicals, salt, salt water, brackish water, seawater, or spray from these sources.~~

Exception: For occupancies and appurtenances thereto in Group R occupancies that are in buildings less than four stories above grade plane, normal-weight aggregate concrete ~~shall~~ is permitted to comply with the requirements of Table 1904.2.2(2) based on the weathering classification (freezing and thawing) determined from Figure 1904.2.2 in lieu of the requirements of ACI 318, Table 4.3.1.a.

~~In addition, concrete that will be exposed to deicing chemicals shall conform to the limitation of Section 1904.2.3.~~

~~**1904.2**~~ **1904.4 Freezing and thawing exposures.** Concrete that will be exposed to freezing and thawing, in the presence of moisture, with or without deicing chemicals being present, ~~or other exposure conditions as defined below~~ shall comply with Sections ~~1904.2.1 through 1904.2.3~~ 1904.4.1 and 1904.4.2.

~~**1904.2.1**~~ **1904.4.1 Air entrainment.** Concrete exposed to freezing and thawing ~~or deicing chemicals~~ while moist shall be air entrained in accordance with ACI 318, Section ~~4.2.1~~ 4.4.1:

~~**1904.2.3**~~ **1904.4.2 Deicing chemicals.** For concrete exposed to freezing and thawing in the presence of moisture and deicing chemicals, the maximum weight of fly ash, other pozzolans, silica fume or slag that is included in the concrete shall not exceed the percentages of the total weight of cementitious materials permitted by ACI 318, Section ~~4.2.3~~ 4.4.2.

4. Delete without substitution:

~~**1904.3 Sulfate exposures.** Concrete that will be exposed to sulfate-containing solutions or soils shall comply with the maximum water-cementitious materials ratios and/or minimum specified compressive strength and be made with the appropriate type of cement in accordance with the provisions of ACI 318, Section 4.3.~~

~~**1904.4 Corrosion protection of reinforcement.** Reinforcement in concrete shall be protected from corrosion and exposure to chlorides in accordance with ACI 318, Section 4.4.~~

5. Add new text as follows:

1904.5 Alternative cementitious materials for sulfate exposure. Alternative combinations of cementitious materials for use in sulfate-resistant concrete to those listed in ACI 318, Table 4.3.1.b shall be permitted in accordance with ACI 318, Section 4.5.1.

6. Revise as follows:

1907.7 Concrete protection for reinforcement. The minimum specified concrete cover for reinforcement shall comply with Sections 1907.7.1 through 1907.7.7.

1907.7.1 Cast-in-place concrete (nonprestressed). Minimum specified concrete cover shall be provided for reinforcement in nonprestressed, cast-in-place concrete construction in accordance with ACI 318, Section 7.7.1.

1907.7.2 Cast-in-place concrete (prestressed). The minimum specified concrete cover for prestressed and nonprestressed reinforcement, ducts and end fittings in cast-in-place prestressed concrete shall comply with ACI 318, Section 7.7.2.

1907.7.3 Precast concrete (manufactured under plant control conditions). The minimum specified concrete cover for prestressed and nonprestressed reinforcement, ducts and end fittings in precast concrete manufactured under plant control conditions shall comply with ACI 318, Section 7.7.3.

1907.7.4 Bundled bars. The minimum specified concrete cover for bundled bars shall comply with ACI 318, Section 7.7.4.

1907.7.5 Headed shear stud reinforcement. For headed shear stud reinforcement, the minimum specified concrete cover shall comply with ACI 318, Section 7.7.5.

~~1907.7.5~~ **1907.7.6 Corrosive environments.** In corrosive environments or other severe exposure conditions, prestressed and nonprestressed reinforcement shall be provided with additional protection in accordance with ACI 318, Section ~~7.7.5~~ 7.7.6.

~~1907.7.6~~ **1907.7.7 Future extensions.** Exposed reinforcement, inserts and plates intended for bonding with future extensions shall be protected from corrosion.

~~1907.7.7~~ **1907.7.8 Fire protection.** When this code requires a thickness of cover for fire protection greater than the minimum concrete cover specified in Section 1907.7, such greater thickness shall be used specified.

1908.1 General. The text of ACI 318 shall be modified as indicated in Sections 1908.1.1 through ~~1908.1.16~~ 1908.1.9.

7. Delete without substitution:

~~1908.1.1 ACI 318, Section 10.5.~~ Modify ACI 318, Section 10.5, by adding new Section 10.5.5 to read as follows:

~~10.5.5—In structures assigned to Seismic Design Category B, beams in ordinary moment frames forming part of the seismic-force-resisting system shall have at least two main flexural reinforcing bars continuously top and bottom throughout the beam and continuous through or developed within exterior columns or boundary elements.~~

~~1908.1.2 ACI 318, Section 11.11.~~ Modify ACI 318, Section 11.11, by changing its title to read as shown below and by adding new Section 11.11.3 to read as follows:

~~11.11—Special provisions for columns.~~

~~11.11.3—In structures assigned to Seismic Design Category B, columns of ordinary moment frames having a clear height to maximum-plan-dimension ratio of five or less shall be designed for shear in accordance with 21.12.3.~~

8. Revise as follows:

~~1908.1.3~~ **1908.1.1 ACI 318, Section 21.4 2.2.** Modify existing definitions and add the following definitions to ACI 318, Section 21.4 2.2.

9. Add new definition as follows:

SPECIAL STRUCTURAL WALL. A cast-in-place or precast wall complying with the requirements of 21.2.3 through 21.2.7, 21.10, and 21.11, as applicable, in addition to the requirements for ordinary reinforced concrete structural walls or ordinary precast structural walls, as applicable. Where ASCE 7 refers to a “special reinforced concrete structural wall,” it shall be deemed to mean a “special structural wall.”

1908.1.4 1908.1.2 ACI 318, Section 21.2.4 21.1.1. Modify ACI 318 Sections 21.2.1.2, 21.2.1.3 and 21.2.1.4 21.1.1.3 through 21.1.1.5, to read as follows:

10. Delete and substitute as follows:

~~21.2.1.2 – For structures assigned to Seismic Design Category A or B, provisions of Chapters 1 through 18 and 22 shall apply except as modified by the provisions of this chapter. Where the design seismic loads are computed using provisions for intermediate or special concrete systems, the requirements of Chapter 21 for intermediate or special systems, as applicable, shall be satisfied.~~

~~21.2.1.3 – For structures assigned to Seismic Design Category C, intermediate or special moment frames, intermediate precast structural walls or ordinary or special reinforced concrete structural walls shall be used to resist seismic forces induced by earthquake motions. Where the design seismic loads are computed using provisions for special concrete systems, the requirements of Chapter 21 for special systems, as applicable, shall be satisfied.~~

~~21.2.1.4 – For structures assigned to Seismic Design Category D, E or F, special moment frames, special reinforced concrete structural walls, diaphragms and trusses and foundations complying with 21.2 through 21.10 or intermediate precast structural walls complying with 21.13 shall be used to resist forces induced by earthquake motions. Members not proportioned to resist earthquake forces shall comply with 21.11.~~

21.1.1.3 – Structures assigned to SDC B shall comply with Chapters 1 through 19 and 22. For a structure assigned to SDC B using ordinary moment frames as part of the seismic-force resisting system, the provisions of 21.1.2 and 21.2 shall apply. For a structure assigned to SDC B and using intermediate or special systems, the applicable provisions of 21.1.3 through 21.1.7, and 21.3 through 21.10 shall also apply.

21.1.1.4 – Structures assigned to SDC C shall comply with Chapters 1 through 19, and the seismic-force-resisting system shall be intermediate or special moment frames, intermediate precast structural walls, or ordinary reinforced concrete or special structural walls. For a structure assigned to SDC C and using intermediate moment frames as part of the seismic-force-resisting system the provisions of 21.1.2 and 21.3 shall apply. For a structure assigned to SDC C and using special moment frames, or intermediate precast or special structural walls, the applicable provisions of 21.1.3 through 21.1.7, and 21.4 through 21.10 shall also apply. Any structure assigned to SDC C shall satisfy 21.1.8. Except for footings, pedestals and basement walls in accordance with 22.10 or as permitted by the International Building Code, structural elements of plain concrete are prohibited.

21.1.1.5 – Structures assigned to SDC D, E or F shall comply with Chapters 1 through 19, and the seismic-force-resisting system shall be special moment frames, intermediate precast structural walls, or special structural walls. For a structure assigned to SDC D, E, or F, the provisions of 21.1.2 through 21.1.8 and 21.4 through 21.13 shall apply. Except for footings, pedestals and basement walls in accordance with 22.10 or as permitted by the International Building Code, structural elements of plain concrete are prohibited.

11. Delete without substitution:

1908.1.5 ACI 318, Section 21.2.5. Modify ACI 318, Section 21.2.5, by renumbering as Section 21.2.5.1 and adding new Section 21.2.5.2 to read as follows:

~~21.2.5 – Reinforcement in members resisting earthquake-induced forces.~~

~~21.2.5.1 – Except as permitted in 21.2.5.2, reinforcement resisting earthquake-induced flexural and axial forces in frame members and in structural wall boundary elements shall comply with ASTM A 706. ASTM A 615, Grades 40 and 60 reinforcement, shall be permitted in these members if (a) the actual yield strength based on mill tests does not exceed the specified yield, f_y , strength by more than 18,000 psi (124 MPa) [retests shall not exceed this value by more than an additional 3,000 psi (21 MPa)], and (b) the ratio of the actual tensile strength to the actual yield strength is not less than 1.25. For computing shear strength, the value of f_{yt} for transverse reinforcement, including spiral reinforcement, shall not exceed 60,000 psi (414 MPa).~~

~~21.2.5.2 – Prestressing steel shall be permitted in flexural members of frames, provided the average prestress, f_{pc} , calculated for an area equal to the member's shortest cross-sectional dimension multiplied by the perpendicular dimension shall be the lesser of 700 psi (4.83 MPa) or $f_c/6$ at locations of nonlinear action where prestressing steel is used in members of frames.~~

1908.1.6 ACI 318, Section 21.2. Modify ACI 318, Section 21.2, by adding new Section 21.2.9 to read as follows:

~~21.2.9—Anchorages for unbonded post-tensioning tendons resisting earthquake induced forces in structures assigned to Seismic Design Category C, D, E or F shall withstand, without failure, 50 cycles of loading ranging between 40 and 85 percent of the specified tensile strength of the prestressing steel.~~

1908.1.7 ACI 318, Section 21.3. Modify ACI 318, Section 21.3, by adding new Section 21.3.2.5 to read as follows:

~~21.3.2.5—Unless the special moment frame is qualified for use through structural testing as required by 21.6.3, for flexural members prestressing steel shall not provide more than one quarter of the strength for either positive or negative moment at the critical section in a plastic hinge location and shall be anchored at or beyond the exterior face of a joint.~~

12. Revise as follows:

1908.1.13 1908.1.3 ACI 318, Section 21.13 21.4. Modify ACI 318, Section 21.13, by renumbering Section 21.13.3 to become 21.13.4 and adding new Sections 21.13.3, 21.13.5 and 21.13.6 Section 21.4, by renumbering Section 21.4.3 to become 21.4.4 and adding new Sections 21.4.3, 21.4.5 and 21.4.6 to read as follows:

~~21.13.3 21.4.3—Except for Type 2 mechanical splices, connection elements~~ Connections that are designed to yield shall be capable of maintaining 80 percent of their design strength at the deformation induced by the design displacement ~~or shall use Type 2 mechanical splices.~~

~~21.13.4 21.4.4—~~ Elements of the connection that are not designed to yield shall develop at least 1.5 Sy.

~~21.13.5 21.4.5—~~ Wall piers not designed as part of a moment frame shall have transverse reinforcement designed to resist the shear forces determined from ~~21.12.3 21.3.3~~. Spacing of transverse reinforcement shall not exceed 8 inches (203 mm). Transverse reinforcement shall be extended beyond the pier clear height for at least 12 inches (305 mm).

Exceptions:

1. Wall piers that satisfy ~~21.14 21.13~~.
2. Wall piers along a wall line within a story where other shear wall segments provide lateral support to the wall piers and such segments have a total stiffness of at least six times the sum of the stiffnesses of all the wall piers.

~~21.13.6 21.4.6—~~ Wall segments with a horizontal length-to-thickness ratio less than 2.5 shall be designed as columns.

1908.1.8 1908.1.4 ACI 318, Section 21.7 21.9 Modify ACI 318, Section 21.7 21.9, by adding new Section 21.7.10 21.9.10 to read as follows:

~~21.7.10 21.9.10—~~ Wall piers and wall segments.

~~21.7.10.1 21.9.10.1—~~ Wall piers not designed as a part of a special moment frame shall have transverse reinforcement designed to satisfy the requirements in ~~21.7.10.2 21.9.10.2~~.

Exceptions:

1. Wall piers that satisfy ~~21.14 21.13~~.
2. Wall piers along a wall line within a story where other shear wall segments provide lateral support to the wall piers and such segments have a total stiffness of at least six times the sum of the stiffness of all the wall piers.

~~21.7.10.2 21.9.10.2—~~ Transverse reinforcement with seismic hooks at both ends shall be designed to resist the shear forces determined from ~~21.4.5.1 21.6.5.1~~. Spacing of transverse reinforcement shall not exceed 6 inches (152 mm). Transverse reinforcement shall be extended beyond the pier clear height for at least 12 inches (305 mm).

~~21.7.10.3 21.9.10.3—~~ Wall segments with a horizontal length-to-thickness ratio less than 2.5 shall be designed as columns.

1908.1.9 1908.1.5 ACI 318, Section 21.8 21.10. Modify ACI 318, Section ~~21.8.4 21.10.2~~, to read as follows:

~~21.8.4~~ 21.10.2 – Special structural walls constructed using precast concrete shall satisfy all the requirements of ~~21.7~~ 21.9 for cast-in-place special structural walls in addition to Sections ~~21.13.2 through 21.13.4~~ 21.4.2 through 21.4.4.

1908.1.10 1908.1.6 **ACI 318, Section 21.10.1.4** 21.12.1.1. Modify ACI 318, Section ~~21.10.1.4~~ 21.12.1.1, to read as follows:

~~21.10.1.4~~ 21.12.1.1– Foundations resisting earthquake-induced forces or transferring earthquake-induced forces between a structure and the ground shall comply with the requirements of Section ~~21.10~~ 21.12 and other applicable provisions of ACI 318 *unless modified by Chapter 18 of the International Building Code*.

13. Delete without substitution:

1908.1.11 **ACI 318, Section 21.11**. Modify ACI 318, Section ~~21.11.2.2~~ to read as follows:

~~21.11.2.2~~—Members with factored gravity axial forces exceeding $(A_g f_c/10)$ shall satisfy ~~21.4.3, 21.4.4.1(c), 21.4.4.3 and 21.4.5~~. The maximum longitudinal spacing of ties shall be so for the full column height. Spacing, so, shall not exceed the smaller of six diameters of the smallest longitudinal bar enclosed and 6 inches (152 mm). Lap splices of longitudinal reinforcement in such members need not satisfy ~~21.4.3.2~~ in structures where the seismic-force-resisting system does not include special moment frames.

Section 1908.1.12 **ACI 318, Section 21.12.5**. Modify ACI 318, Section ~~21.12.5~~, by adding new Section ~~21.12.5.6~~ to read as follows:

~~21.12.5.6~~—Columns supporting reactions from discontinuous stiff members, such as walls, shall be designed for the special load combinations in Section ~~1605.4~~ of the International Building Code and shall be provided with transverse reinforcement at the spacing, so, as defined in ~~21.12.5.2~~ over their full height beneath the level at which the discontinuity occurs. This transverse reinforcement shall be extended above and below the column as required in ~~21.4.4.5~~.

14. Revise as follows:

1908.1.14 1908.1.7 **ACI 318, Section 22.6**. Modify ACI 318, Section ~~22.6~~, by adding new Section ~~22.6.7~~ to read:

~~22.6.7~~ – *Detailed plain concrete structural walls.*

~~22.6.7.1~~ – *Detailed plain concrete structural walls are walls conforming to the requirements of ordinary structural plain concrete walls and 22.6.7.2.*

~~22.6.7.2~~ - *Reinforcement shall be provided as follows:*

(a) *Vertical reinforcement of at least 0.20 square inch (129 mm²) in cross-sectional area shall be provided continuously from support to support at each corner, at each side of each opening and at the ends of walls. The continuous vertical bar required beside an opening is permitted to substitute for one of the two No. 5 bars required by 22.6.6.5.*

(b) *Horizontal reinforcement at least 0.20 square inch (129 mm²) in cross-sectional area shall be provided:*

- 1. Continuously at structurally connected roof and floor levels and at the top of walls;*
- 2. At the bottom of load-bearing walls or in the top of foundations where doweled to the wall; and*
- 3. At a maximum spacing of 120 inches (3048mm).*

Reinforcement at the top and bottom of openings, where used in determining the maximum spacing specified in Item 3 above, shall be continuous in the wall.

1908.1.15 1908.1.8 **ACI 318, Section 22.10**. Delete ACI 318, Section ~~22.10~~, and replace with the following:

~~22.10~~ – *Plain concrete in structures assigned to Seismic Design Category C, D, E or F.*

~~22.10.1~~ – *Structures assigned to Seismic Design Category C, D, E or F shall not have elements of structural plain concrete, except as follows:*

(a) Structural plain concrete basement, foundation or other walls below the base are permitted in detached one- and two-family dwellings three stories or less in height constructed with stud-bearing walls. In dwellings assigned to Seismic Design Category D or E, the height of the wall shall not exceed 8 feet (2438 mm), the thickness shall not be less than 7 1/2 inches (190 mm), and the wall shall retain no more than 4 feet (1219 mm) of unbalanced fill. Walls shall have reinforcement in accordance with 22.6.6.5.

(b) Isolated footings of plain concrete supporting pedestals or columns are permitted, provided the projection of the footing beyond the face of the supported member does not exceed the footing thickness.

Exception: In detached one- and two-family dwellings three stories or less in height, the projection of the footing beyond the face of the supported member is permitted to exceed the footing thickness.

(c) Plain concrete footings supporting walls are permitted, provided the footings have at least two continuous longitudinal reinforcing bars. Bars shall not be smaller than No. 4 and shall have a total area of not less than 0.002 times the gross cross-sectional area of the footing. For footings that exceed 8 inches (203 mm) in thickness, a minimum of one bar shall be provided at the top and bottom of the footing. Continuity of reinforcement shall be provided at corners and intersections.

Exceptions:

1. In detached one- and two-family dwellings three stories or less in height and constructed with stud-bearing walls, plain concrete footings without longitudinal reinforcement supporting walls are permitted.
2. For foundation systems consisting of a plain concrete footing and a plain concrete stem wall, a minimum of one bar shall be provided at the top of the stem wall and at the bottom of the footing.
3. Where a slab on ground is cast monolithically with the footing, one No. 5 bar is permitted to be located at either the top of the slab or bottom of the footing.

15. Delete without substitution:

~~1908.1.16 (Supp) ACI 318, Section D.3.3. Modify ACI 318, Sections D.3.3.2 through D.3.3.5 to read as follows:~~

~~D.3.3.2 B In structures assigned to Seismic Design Category C, D, E or F, post-installed anchors for use under D.2.3 shall have passed the Simulated Seismic Tests of ACI 355.2.~~

~~D.3.3.3 B In structures assigned to Seismic Design Category C, D, E or F, the design strength of anchors shall be taken as $0.75nN_n$ and $0.75nV_n$, where n is given in D.4.4 or D.4.5, and N_n and V_n are determined in accordance with D.4.1.~~

~~D.3.3.4 B In structures assigned to Seismic Design Category C, D, E or F, anchors shall be designed to be governed by tensile or shear strength of a ductile steel element, unless D.3.3.5 is satisfied.~~

~~**Exception:** Anchors in concrete designed to support nonstructural components in accordance with ASCE 7 Section 13.4.2 need not satisfy Section D.3.3.4.~~

~~D.3.3.5 B Instead of D.3.3.4, the attachment that the anchor is connecting to the structure shall be designed so that the attachment will undergo ductile yielding at a load level corresponding to anchor forces not greater than the design strength of anchor specified in D.3.3.3, or the minimum design strength of the anchor shall be at least 2.5 times the factored forces transmitted by the attachment.~~

~~**Exception:** Anchors in concrete designed to support nonstructural components in accordance with ASCE 7 Section 13.4.2 need not satisfy Section D.3.3.5.~~

16. Add new text as follows:

1908.1.9 ACI 318, Section D.4.2.2. Modify ACI 318, Sections D.4.2.2 to read as follows:

D.4.2.2 – The concrete breakout strength requirements for anchors shall be considered satisfied by the design procedure of D.5.2 and D.6.2.

17. Revise as follows:

1909.6.1 Basement walls. The thickness of exterior basement walls and foundation walls shall be not less than 7 1/2 inches (191 mm). ~~Structural plain concrete exterior basement walls shall be exempt from the requirements for special exposure conditions of Section 1904.2.2.~~

1909.6.3 Openings in walls. Not less than ~~two~~ one No. 5 ~~bars~~ bar shall be provided around window ~~and~~ door and similar sized openings. ~~Such bars~~ The bar shall ~~extend at least 24 inches (610 mm) beyond~~ be anchored to develop f_y in tension at the corners of openings.

1912.1 Scope. The provisions of this section shall govern the strength design of anchors installed in concrete for purposes of transmitting structural loads from one connected element to the other. Headed bolts, headed studs and hooked (J- or L-) bolts cast in concrete and expansion anchors and undercut anchors installed in hardened concrete shall be designed in accordance with Appendix D of ACI 318 as modified by Section ~~1908.1.16~~ 1908.1.9, provided they are within the scope of Appendix D.

Exception: ~~Where the basic concrete breakout strength in tension of a single anchor, N_b , is determined in accordance with Equation (D-7), the concrete breakout strength requirements of Section D.4.2.2 shall be considered satisfied by the design procedures of Sections D.5.2 and D.6.2 for anchors exceeding 2 inches (51 mm) in diameter or 25 inches (635 mm) tensile embedment depth.~~

The strength design of anchors that are not within the scope of Appendix D of ACI 318, and as amended ~~above~~ in Section 1908.1.9, shall be in accordance with an approved procedure.

**TABLE 1704.3
REQUIRED VERIFICATION AND INSPECTION OF STEEL CONSTRUCTION**

VERIFICATION AND INSPECTION	CONTINUOUS	PERIODIC	REFERENCED STANDARD ^a	IBC REFERENCE
5. Inspection of welding:	—	—		
a. Structural Steel:				
1) Complete and partial penetration groove welds.	X	—	AWS D1.1	1704.3.1
2) Multipass fillet welds	X	—		
3) Single-pass fillet welds > 5/16"	X	—		
4) Single-pass fillet welds ≤ 5/16"	—	X		
5) Floor and roof deck welds.	—	X	AWS D1.3	—
b. Reinforcing steel:	—	—		
1) Verification of weldability of reinforcing steel other than ASTM A706	—	X	AWS D1.4 ACI 318: 3.5.2	—
2) Reinforcing steel-resisting flexural and axial forces in intermediate and special moment frames, and boundary elements of special reinforced structural walls of concrete shear walls and shear reinforcement.	X	—		
3) Shear reinforcement.	X	—		
4) Other reinforcing steel	—	X		

(Portions of table and footnotes not shown remain unchanged)

1708.3 Reinforcing and prestressing steel. Certified mill test reports shall be provided for each shipment of reinforcing steel used to resist flexural, shear and axial forces in reinforced concrete intermediate frames, special moment frames and boundary elements of special ~~reinforced structural walls of~~ concrete or special reinforced masonry shear walls. Where ASTM A 615 reinforcing steel is used to resist earthquake-induced flexural and axial forces in special moment frames and in wall boundary elements of shear walls in structures assigned to Seismic Design Category D, E or F, as determined in Section 1613, the testing requirements of ACI 318 shall be met. Where ASTM A 615 reinforcing steel is to be welded, chemical tests shall be performed to determine weldability in accordance with Section 3.5.2 of ACI 318.

18. Add update to referenced standard as follows:

ACI

318-~~05~~08 Building Code Requirements for Structural Concrete

Reason: Item 1: The changes proposed are necessary to update the concrete provisions to be consistent with the provisions of ACI 318-08.

Item 2: The changes proposed are necessary to update or delete as necessary, the modifications to ACI 318 for consistency with the provisions of ACI 318-08. The following modifications are being deleted because the modifications have been incorporated into ACI 318-08. Changes to individual sections are indicated below. Section numbers cited are based on the number in the 2006 IBC, unless noted otherwise.

1908.1.1 – This modification has been incorporated into ACI 318-08, Section 21.2.2.

1908.1.2 – This modification has been incorporated into ACI 318-08, Section 21.2.3.

1908.1.3 – The definition of “special structural wall” from ACI 318-08 has been included and modified for the following reasons. In ACI 318-05, a “special reinforced concrete structural wall” was a cast-in-place wall, and a separate definition applied to a “special precast structural wall.” Under ACI 318-08, the definition of “special precast structural wall” has been deleted, and the former definition of “special reinforced concrete structural wall” has been revised to “special structural wall” which is now defined as “a cast-in-place or precast wall.” The modification to the ACI 318-08 definition of special structural wall, by adding another sentence, is necessary since ASCE 7-05 Table 12.2-1 – Design Coefficients and Factors for Seismic Force-Resisting Systems – uses the ACI 318-05 term “special reinforced concrete structural wall.” In addition, it does not mention “special structural wall.” Therefore, the sentence is being added to coordinate new terminology used in ACI 318-08 with that used in ASCE 7-05.

1980.1.4 - These modifications to ACI 318-08 are necessary because ACI 318-08 does not indicate the seismic-force-resisting systems permitted in the various seismic design categories.

1908.1.5 – This modification has been incorporated into ACI 318-08, Section 21.5.2.5(a).

1908.1.6 – This modification has been incorporated into ACI 318-08, Section 21.5.2.5(d).

1908.1.7 – This modification has been incorporated into ACI 318-08, Section 21.5.2.5(c).

1908.1.11 - This modification has been incorporated into ACI 318-08, Section 21.13.3.2 since it only references 21.6.3.1 and does not reference 21.6.3.2.

1908.1.12 – This modification has been incorporated into ACI 318-08, Section 21.3.5.6.

1908.1.16 – This modification has been incorporated into ACI 318-08, Section D.3.3.

1908.1.9 (new) – This modification to Section D.4.2.2 of ACI 318 is already in Section 1912.1 as an exception. It is being relocated to Section 1908 to consolidate all ACI 318 modifications in one section. Also, see “reason” for item 4.

All other proposed changes are necessary because Chapter 21 of ACI 318-08 has been reformatted which resulted in section numbers being changed.

Item 3: The changes proposed are necessary to update the structural plain concrete provisions to be consistent with the provisions of ACI 318-08.

Item 4: The changes proposed are necessary because the modification to ACI 318-05 in Section 1908.1.16 has been incorporated into ACI 318-08; therefore, the modification is no longer needed. In addition, the modification to ACI 318, Section D.4.2.2 in the exception is being relocated to Section 1908.1.9.

Item 5 – For consistency with the change in ACI 318-08 from “special reinforced concrete structural wall” to “Special structural wall.” Also, see reason for item 1, Section 1908.1.3.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Errata: In item 3 correct new section numbers as follows:

~~4904.2~~ **1904.4 Freezing and thawing exposures.** Concrete that will be exposed to freezing and thawing, in the presence of moisture, with or without deicing chemicals being present, or other exposure conditions as defined below shall comply with Sections ~~4904.2.1 through 1904.2.3~~ **1904.4.1 and 1904.4.2.**

~~4904.2.1~~ **1904.4.1 Air entrainment.** Concrete exposed to freezing and thawing ~~or deicing chemicals while moist~~ shall be air entrained in accordance with ACI 318, Section ~~4.2.1~~ **4.4.1:**

In item 9 correct to read as follows:

~~4908.1.4~~ **1908.1.2 ACI 318**, Section ~~21.2.1~~ **21.1.1.** Modify ACI 318 Sections ~~21.2.1.2, 21.2.1.3 and 21.2.1.4~~ **21.1.1.3 through 21.1.1.5,** to read as follows:

Revise item 10 to read as follows:

21.1.1.3 – Structures assigned to SDC B shall comply with Chapters 1 through 19 and 22. For a structure assigned to SDC B using ordinary moment frames as part of the seismic-force resisting system, the provisions of 21.1.2 and 21.2 shall apply. For a structure assigned to SDC B and using intermediate or special systems, the applicable provisions of 21.1.3 through 21.1.7, and 21.3 through 21.10 shall also apply.

21.1.1.4 – Structures assigned to SDC C shall comply with Chapters 1 through 19, and the seismic-force-resisting system shall be intermediate or special moment frames, intermediate precast structural walls, or ordinary reinforced concrete or special structural walls. For a structure assigned to SDC C and using intermediate moment frames as part of the seismic-force-resisting system the provisions of 21.1.2 and 21.3 shall apply. For a structure assigned to SDC C and using special moment frames, or intermediate precast or special structural walls, the applicable provisions of 21.1.3 through 21.1.7, and 21.4 through 21.10 shall also apply. Any structure assigned to SDC C shall satisfy 21.1.8. Except for footings, pedestals and basement walls in accordance with 22.10 or as permitted by the International Building Code, structural elements of plain concrete are prohibited.

21.1.1.5 – Structures assigned to SDC D, E or F shall comply with Chapters 1 through 19, and the seismic-force-resisting system shall be special moment frames, intermediate precast structural walls, or special structural walls. For a structure assigned to SDC D, E, or F, the provisions of 21.1.2 through 21.1.8 and 21.4 through 21.13 shall apply. Except for footings, pedestals and basement walls in accordance with 22.10 or as permitted by the International Building Code, structural elements of plain concrete are prohibited.

In item 17 revise to read as follows:

1912.1 Scope. The provisions of this section shall govern the strength design of anchors installed in concrete for purposes of transmitting structural loads from one connected element to the other. Headed bolts, headed studs and hooked (J- or L-) bolts cast in concrete and expansion anchors and undercut anchors installed in hardened concrete shall be designed in accordance with Appendix D of ACI 318 as modified by Section ~~4908.1.4~~ **1908.1.9**, provided they are within the scope of Appendix D.

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Exception: Where the basic concrete breakout strength in tension of a single anchor, N_b , is determined in accordance with Equation (D-7), the concrete breakout strength requirements of Section D.4.2.2 shall be considered satisfied by the design procedures of Sections D.5.2 and D.6.2 for anchors exceeding 2 inches (51 mm) in diameter or 25 inches (635 mm) tensile embedment depth.

The strength design of anchors that are not within the scope of Appendix D of ACI 318, and as amended above in Section 1908.1.9, shall be in accordance with an approved procedure.

Add update to referenced standard as follows:

ACI
318-0508 Building Code Requirements for Structural Concrete

Committee Action:

Approved as Modified

Modify proposal as follows:

1904.2 Exposure categories and classes. Concrete shall be assigned to exposure classes in accordance with ACI 318, Section 4.2 based on:

1. Exposure to freezing and thawing in a moist condition or deicer chemicals;
2. Exposure to sulfates in water or soil;
3. Exposure to water where the concrete is intended to have low permeability; and
4. Exposure to chlorides from deicing chemicals, salt, salt water, brackish water, seawater or spray from these sources, where the concrete has steel reinforcement.

SPECIAL STRUCTURAL WALL. A cast-in-place or precast wall complying with the requirements of 21.2.3 through 21.2.7, 21.10, and 21.11 21.1.3 through 21.1.7, 21.9 and 21.10, as applicable, in addition to the requirements for ordinary reinforced concrete structural walls or ordinary precast structural walls, as applicable. Where ASCE 7 refers to a "special reinforced concrete structural wall," it shall be deemed to mean a "special structural wall."

1908.1.2 ACI 318, Section 21.1.1. Modify ACI 318 Sections 21.1.1.3 through 21.1.1.5 and 21.1.1.7 to read as follows:

~~21.1.1.3 — Structures assigned to SDC B shall comply with Chapters 1 through 19 and 22. For a structure assigned to SDC B using ordinary moment frames as part of the seismic force-resisting system, the provisions of 21.1.2 and 21.2 shall apply. For a structure assigned to SDC B and using intermediate or special systems, the applicable provisions of 21.1.3 through 21.1.7, and 21.3 through 21.10 shall also apply.~~

~~21.1.1.3 — Structures assigned to Seismic Design Category A shall satisfy requirements of Chapters 1 to 19 and 22; Chapter 21 does not apply. Structures assigned to Seismic Design Category B, C, D, E, or F also shall satisfy 21.1.1.4 through 21.1.1.8, as applicable. Except for structural elements of plain concrete complying with Section 1908.1.8 of the International Building Code, structural elements of plain concrete are prohibited in structures assigned to Seismic Design Category C, D, E or F.~~

~~21.1.1.4 — Structures assigned to SDC C shall comply with Chapters 1 through 19, and the seismic force-resisting system shall be intermediate or special moment frames, intermediate precast structural walls, or ordinary reinforced concrete or special structural walls. For a structure assigned to SDC C and using intermediate moment frames as part of the seismic force-resisting system the provisions of 21.1.2 and 21.3 shall apply. For a structure assigned to SDC C and using special moment frames, or intermediate precast or special structural walls, the applicable provisions of 21.1.3 through 21.1.7, and 21.4 through 21.10 shall also apply. Any structure assigned to SDC C shall satisfy 21.1.8. Except for footings, pedestals and basement walls in accordance with 22.10 or as permitted by the International Building Code, structural elements of plain concrete are prohibited.~~

~~21.1.1.5 — Structures assigned to SDC D, E or F shall comply with Chapters 1 through 19, and the seismic force-resisting system shall be special moment frames, intermediate precast structural walls, or special structural walls. For a structure assigned to SDC D, E, or F, the provisions of 21.1.2 through 21.1.8 and 21.4 through 21.13 shall apply. Except for footings, pedestals and basement walls in accordance with 22.10 or as permitted by the International Building Code, structural elements of plain concrete are prohibited.~~

~~21.1.1.7 — Structural systems designated as part of the seismic-force-resisting system shall be restricted to those permitted by ASCE 7. Except for Seismic Design Category A, for which Chapter 21 does not apply, the following provision shall be satisfied for each structural system designated as part of the seismic-force-resisting system, regardless of the Seismic Design Category.~~

- (a) Ordinary moment frames shall satisfy 21.2.
- (b) Ordinary reinforced concrete structural walls and ordinary precast structural walls need not satisfy any provisions in Chapter 21.
- (c) Intermediate moment frames shall satisfy 21.3.
- (d) Intermediate precast structural walls shall satisfy 21.4.
- (e) Special moment frames shall satisfy 21.5 through 21.8.
- (f) Special structural wall shall satisfy 21.9.

~~Special structural walls constructed using precast concrete shall satisfy 21.10.~~

~~All special moment frames and special structural walls shall also satisfy 21.1.3 through 21.1.7.~~

1908.1.9 ACI 318, Section D.3.3. Modify ACI 318, Sections D.3.3.4 and D.3.3.5 to read as follows:

D.3.3.4 Anchors shall be designed to be governed by the steel strength of a ductile steel element as determined in accordance with D.5.1 and D.6.1, unless either D.3.3.5 or D.3.3.6 is satisfied.

Exception: Anchors in concrete designed to support nonstructural components in accordance with ASCE 7 Section 13.4.2 need not satisfy Section D.3.3.4.

D.3.3.5 Instead of D.3.3.4, the attachment that the anchor is connecting to the structure shall be designed so that the attachment will undergo ductile yielding at a force level corresponding to anchor forces not greater than the design strength of anchor specified in D.3.3.3.

Exception: *Anchors in concrete designed to support nonstructural components in accordance with ASCE 7 Section 13.4.2 need not satisfy Section D.3.3.5.*

1908.1.9 1908.1.10 ACI 318, Section D.4.2.2. Modify ACI 318, Section D.4.2.2 to read as follows:

D.4.2.2 – The concrete breakout strength requirements *for anchors* shall be considered satisfied by the design procedure of D.5.2 and D.6.2.
1912.1 Scope. The provisions of this section shall govern the strength design of anchors installed in concrete for purposes of transmitting structural loads from one connected element to the other. Headed bolts, headed studs and hooked (J- or L-) bolts cast in concrete and expansion anchors and undercut anchors installed in hardened concrete shall be designed in accordance with Appendix D of ACI 318 as modified by Section 1908.1.9 and 1908.10, provided they are within the scope of Appendix D.

The strength design of anchors that are not within the scope of Appendix D of ACI 318, and as amended in Section 1908.1.9 and 1908.1.10, shall be in accordance with an approved procedure.

(Portions of proposal not shown remain unchanged)

Committee Reason: This change updates the concrete provisions of the code to coordinate with the latest edition of the ACI 318 concrete standard. The modification updates section references to reflect the final published version of the 2008 edition of ACI 318. Similarly the modifications to Section 1908.1.2 reflect changes made after submittal of this proposal in the related portions of ACI 318 Chapter 21 based on public comments that ACI received. The modification also retains current section 1908.1.16, renumbered as 1908.1.9, in order to retain needed modifications that were added to the IBC in the 2006/2007 code cycle.

Assembly Action:

None

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Further modify proposal as follows:

1908.1.10 ACI 318, Section D.4.2.2. Modify ACI 318, Section D.4.2.2:

~~D.4.2.2 – The concrete breakout strength requirements *for anchors* shall be considered satisfied by the design procedure of D.5.2 and D.6.2.~~

D.4.2.2 – The concrete breakout strength requirements for anchors in tension shall be considered satisfied by the design procedure of D.5.2 provided Equation D-8 is not used for anchor embedments exceeding 25 inches. The concrete breakout strength requirements for anchors in shear with diameters not exceeding 2 inches shall be considered satisfied by the design procedure of D.6.2. For anchors in shear with diameters exceeding 2 inches, shear anchor reinforcement shall be provided in accordance with the procedures of D.6.2.9.

Commenter's Reason: Beginning with the 2000 code, the IBC has taken exception to the ACI 318 Appendix D scope limitation on the applicability of the concrete breakout strength equations. Since that time, additional information has become available on this issue. While there is some evidence that the predicted concrete breakout strength for anchors in tension as given by Eq. (D-7) can safely be extended to anchors with embedment depths exceeding 25 in., there is strong evidence that the breakout strength procedure in D.6.2 is unconservative for very large diameter anchors loaded in shear towards a free edge. It is therefore imperative that this exception be removed from the text of the code. The proposal above provides the necessary text. It disallows the use of the alternate, less conservative prediction of concrete breakout strength in tension given by Eq. (D-8) for embedments exceeding 25 in., and it notes that the equations in D.6.2 can only be used to satisfy the concrete breakout strength requirements in shear for anchor diameters not exceeding 2 in. Where larger anchor diameters are used and where concrete edge breakout would otherwise control the anchor strength, it is still possible to use anchor reinforcement in accordance with ACI 318-08 D.6.2.9.

Final Hearing Results

S172-07/08

AMPC

Code Change No: **S173-07/08**

Original Proposal

Section: 1908.1.16

Proponent: John W. Lawson, SE, representing the Structural Engineers Association of California Seismology Tilt-up Subcommittee; David L. McCormick, SE, representing the Structural Engineers Association of California Existing Building Tilt-up Subcommittee

Revise as follows:

1908.1.16 (Supp) ACI 318, Section D.3.3. Modify ACI 318, Sections D.3.3.2 through D.3.3.5 to read as follows:

D.3.3.2 - *In structures assigned to Seismic Design Category C, D, E or F, post-installed anchors for use under D.2.3 shall have passed the Simulated Seismic Tests of ACI 355.2.*

D.3.3.3 - *In structures assigned to Seismic Design Category C, D, E or F, the design strength of anchors shall be taken as $0.75\Phi N_n$ and $0.75\Phi V_n$, where Φ is given in D.4.4 or D.4.5, and N_n and V_n are determined in accordance with D.4.1.*

D.3.3.4 - *In structures assigned to Seismic Design Category C, D, E or F, anchors shall be designed to be governed by tensile or shear strength of a ductile steel element, unless D.3.3.5 is satisfied.*

Exceptions:

1. *Anchors in concrete designed to support nonstructural components in accordance with ASCE 7 Section 13.4.2 need not satisfy Section D.3.3.4.*
2. *Concrete wall anchorage designed to the forces of ASCE 7 Equation 12.11-1 need not satisfy Section D.3.3.4.*

D.3.3.5 - *Instead of D.3.3.4, the attachment that the anchor is connecting to the structure shall be designed so that the attachment will undergo ductile yielding at a load level corresponding to anchor forces not greater than the design strength of anchor specified in D.3.3.3, or the minimum design strength of the anchor shall be at least 2.5 times the factored forces transmitted by the attachment.*

Exceptions:

1. *Anchors in concrete designed to support nonstructural components in accordance with ASCE 7 Section 13.4.2 need not satisfy Section D.3.3.5.*
2. *Concrete wall anchorage designed to the forces of ASCE 7 Equation 12.11-1 need not satisfy Section D.3.3.5.*

Reason: Purpose: To remove the requirements for anchorage ductility at concrete wall anchorage already designed for maximum expected seismic forces.

Background: Following the 1994 Northridge earthquake, surveys of damage to concrete and masonry buildings with flexible roof diaphragms revealed that very limited amounts of wall anchorage ductility was present to resist the induced forces. Brittle tensile failures in steel wall anchorage straps were especially troublesome. In addition, boundary nailing in plywood diaphragms tore out of the plywood edges due to wall anchorage elongation. New code provisions were introduced into the 1997 UBC to address the nonductile wall anchorage behavior observed in the Northridge earthquake.

1997 UBC Section 1633.2.8.1 was chiefly written to address many of the wall anchorage issues spotlighted in the Northridge earthquake. The lack of observed ductility and the need for greater anchorage strength were the reasons behind Section 1633.2.8.1 Items 1 and 4. Wall anchorage forces to flexible diaphragms in Seismic Zones 3 & 4 were increased 50% ($a_p=1.5$) and steel elements had an additional 1.4 force multiplier.

The intent of Section 1633.2.8.1 (items 1, 4, and 5) was for the wall anchorage system to resist brittle failure when subjected to maximum expected roof accelerations. Based on observations of Northridge earthquake damage, it was deemed best to resist brittle failure through the use of significantly higher design forces in conjunction with anticipated material overstrength instead of any reliance on ductility. As a result, material-specific load factors were introduced to provide a uniform level of protection against brittle failure (1.4 steel, 0.85 wood, 1.0 concrete/masonry). This approach is well documented in the 1999 SEAOC Recommended Lateral Force Requirements and Commentary (The Blue Book) [Reference C108.2.8.1].

As further evidence of the intent of these wall anchorage provisions, the 1999 SEAOC Blue Book Commentary states that the reduced R_p value for nonductile and shallow anchorage does not apply to wall anchorage designed using this overstrength approach of Section 1633.2.8.1 [Reference C108.2.8.1].

Current Provisions: In the development of ASCE 7-05, the intent was to maintain the same wall anchorage equation between the 1997 UBC and ASCE 7-05 for flexible diaphragms in high seismic zones. The wall anchorage provisions of ASCE 7-05 Section 12.11.2.1 are directly incorporated from the 1997 UBC Section 1633.2.8.1. Substituting $C_a = 0.4S_{DS}$ (2003 NEHRP Commentary), it can be confirmed that Eq. 12.11-1 is generally equivalent to the 1997 UBC.

Through an unrelated parallel effort, ACI 318-05 Appendix D Sections D.3.3.4 and D.3.3.5 require anchorage ductility in moderate and high seismic zones. ACI's ductility requirement conflicts with the intent behind Section 12.11.2.1 at wall anchorage situations. Furthermore, 2006 IBC Section 1908.1.16 allows an additional 2.5 load factor on top of ASCE forces in lieu of the ACI ductility requirement. This stacking of load factors on top of load factors and ductility requirements is in conflict with the original intent of the wall anchorage provisions.

To summarize, the 1997 UBC and subsequent ASCE 7-05 implement very high wall anchorage force levels to achieve uniform protection against brittle failure without reliance upon ductility. This was achieved using a rational approach considering inherent overstrength. Through the incorporation of ACI 318 Appendix D, anchorage ductility requirements were inadvertently added to these special wall anchorage situations in conflict with the original intent of the provisions. Furthermore, the 2006 IBC force multiplier of 2.5 is redundant to the original force increase behind the UBC and ASCE wall anchorage provisions.

Impact to Design & Construction: Achieving anchorage ductility under ACI 318 Appendix D is very difficult for tilt-up construction with flexible diaphragms. For the ductility condition to be met, steel anchor strength must be weaker than the concrete breakout strength. Because tilt-up walls are inherently thin slender wall designs, anchor embedment depth is limited, making it difficult to increase. In several parametric studies, it is apparent that the ductility provision encourages smaller diameter steel anchors or thicker concrete walls for deeper embedments. Neither of these approaches seems beneficial.

Another unintended consequence of providing ductile anchorage is the potential elongation of the steel causing boundary nailing at plywood diaphragms to tear out of the sheathing edges under maximum seismic force levels. Similar concerns exist for edge welding along steel deck diaphragms at the wall panels.

Using the 2006 IBC 1908.1.16 alternative, the forces are increased to an extreme level due to the 2.5-times load increase previously mentioned. In several parametric studies, this results in a larger number of thin anchors rods spread out over a larger connection area. Spreading these anchor rods out will likely result in non-uniform anchorage force distribution, and instead concentrate the forces over the closest few rods, potentially resulting in a progressive rod failure.

References:

1. SEAOC, *Recommended Lateral Force Requirements and Commentary*, Structural Engineers Association of California, 1999.
2. HARRIS, "Response of Tilt-up Buildings to Seismic Demands: Case Studies from the 1994 Northridge Earthquake," By S.K. Harris, R.O. Hamburger, S.C. Martin, D.L. McCormick, and P.G. Somerville. *Proceedings of the NEHRP Conference and Workshop of Research on the Northridge, California Earthquake of January 17, 1994*. California Universities for Research in Earthquake Engineering (CUREE), Richmond, California. 1998.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Modified

Modify proposal as follows:

1908.1.16 (Supp) ACI 318, Section D.3.3. Modify ACI 318, Sections D.3.3.2 through D.3.3.5 to read as follows:

D.3.3.2 - *In structures assigned to Seismic Design Category C, D, E or F*, post-installed anchors for use under D.2.3 shall have passed the Simulated Seismic Tests of ACI 355.2.

D.3.3.3 - *In structures assigned to Seismic Design Category C, D, E or F*, the design strength of anchors shall be taken as $0.75\Phi N_n$ and $0.75\Phi V_n$, where Φ is given in D.4.4 or D.4.5, and N_n and V_n are determined in accordance with D.4.1.

D.3.3.4 - *In structures assigned to Seismic Design Category C, D, E or F*, anchors shall be designed to be governed by tensile or shear strength of a ductile steel element, unless D.3.3.5 is satisfied.

Exceptions:

1. *Anchors in concrete designed to support nonstructural components in accordance with ASCE 7 Section 13.4.2 need not satisfy Section D.3.3.4.*
2. ~~*Concrete wall anchorage designed to the forces of Wall anchors with design strengths equal to or greater than the force determined in accordance with ASCE 7 Equation 12.11-1 or 12.14-10 need not satisfy Section D.3.3.4.*~~

D.3.3.5 - Instead of D.3.3.4, the attachment that the anchor is connecting to the structure shall be designed so that the attachment will undergo ductile yielding at a load level corresponding to anchor forces not greater than the design strength of anchor specified in D.3.3.3, *or the minimum design strength of the anchor shall be at least 2.5 times the factored forces transmitted by the attachment.*

Exceptions:

1. *Anchors in concrete designed to support nonstructural components in accordance with ASCE 7 Section 13.4.2 need not satisfy Section D.3.3.5.*
2. ~~*Concrete wall anchorage designed to the forces of Wall anchors with design strengths equal to or greater than the force determined in accordance with ASCE 7 Equation 12.11-1 or 12.14-10 need not satisfy Section D.3.3.5.*~~

Committee Reason: This proposal is necessary to improve concrete wall anchorage constructability and provide coordination with the overstrength load combinations. The modification adds a reference to the comparable requirement under the simplified procedure of ASCE 7. The modification also resolves a potential problem by making the exception applicable when the design force is equal to or greater than the value obtained by these equations.

Assembly Action:

None

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Joseph J. Messersmith, Jr., P.E., Portland Cement Association, requests Approval as Modified by this Public Comment.

Further modify the proposal as follows:

1908.1.16 (Supp) ACI 318, Section D.3.3. Modify ACI 318, Sections D.3.3.2 through D.3.3.5 to read as follows:

D.3.3.2 - In structures assigned to Seismic Design Category C, D, E or F, post-installed anchors for use under D.2.3 shall have passed the Simulated Seismic Tests of ACI 355.2.

D.3.3.3 - In structures assigned to Seismic Design Category C, D, E or F, the design strength of anchors shall be taken as $0.75\Phi N_n$ and $0.75\Phi V_n$, where Φ is given in D.4.4 or D.4.5, and N_n and V_n are determined in accordance with D.4.1.

D.3.3.4 - In structures assigned to Seismic Design Category C, D, E or F, anchors shall be designed to be governed by tensile or shear strength of a ductile steel element, unless D.3.3.5 is satisfied.

Exceptions:

1. Anchors in concrete designed to support nonstructural components in accordance with ASCE 7 Section 13.4.2 need not satisfy Section D.3.3.4.
2. ~~Wall~~ Anchors designed to resist wall out-of-plane forces with design strengths equal to or greater than the force determined in accordance with ASCE 7 Equation 12.11-1 or 12.14-10 need not satisfy Section D.3.3.4.

D.3.3.5 - Instead of D.3.3.4, the attachment that the anchor is connecting to the structure shall be designed so that the attachment will undergo ductile yielding at a load level corresponding to anchor forces not greater than the design strength of anchor specified in D.3.3.3, or the minimum design strength of the anchor shall be at least 2.5 times the factored forces transmitted by the attachment.

Exceptions:

1. Anchors in concrete designed to support nonstructural components in accordance with ASCE 7 Section 13.4.2 need not satisfy Section D.3.3.5.
2. ~~Wall~~ Anchors designed to resist wall out-of-plane forces with design strengths equal to or greater than the force determined in accordance with ASCE 7 Equation 12.11-1 or 12.14-10 need not satisfy Section D.3.3.5.

Commenter's Reason: Upon further review of the modified version of S173 following the Palm Springs hearings, it was felt that the provisions may be incorrectly interpreted to apply to any anchor in a wall, which is not the intent. The revised wording should make it clear that the provisions are intended for anchors providing resistance to wall out-of-plane anchorage forces prescribed in ASCE 7.

Based on the forgoing, you are urged to vote in favor of the motion that will be made to further modify the proposal as indicated above.

Final Hearing Results

S173-07/08

AMPC

Code Change No: S174-07/08

Original Proposal

Sections: 1405.9, 1405.5.2, 1405.9, 1604.3.4, 1704.5, 1704.5.1 through 1704.5.3, Table 1704.5.1, Table 1704.5.3, 1708.1.1 through 1708.1.4, 1812.7, 2101.2.2 through 2101.2.6, 2106.1 through 2106.1.1.3, 2106.3, 2016.1.1.3.1, 2106.1.1.3.2, 2106.2, 2106.3, 2106.4, 2106.5, 2106.6, 2107.1 through 2107.8 through 2108.4, 2109.1, 2109.2.3.1, 2109.7.3, Chapter 35

Proponent: Phillip Samblanet, The Masonry Society

1. Revise as follows:

1405.5 Anchored masonry veneer. Anchored masonry veneer shall comply with the provisions of Sections 1405.5, 1405.6, 1405.7 and 1405.8 and Sections 6.1 and 6.2 of ~~ACI 530/ASCE 5/TMS 402~~ TMS 402/ACI 530/ASCE 5.

1405.5.1 Tolerances. Anchored masonry veneers in accordance with Chapter 14 are not required to meet the tolerances in Article 3.3 G1 of ~~ACI 530.1/ASCE 6/TMS 602~~ TMS 602/ACI 530.1/ASCE 6.

1405.5.2 (Supp) Seismic requirements. Anchored masonry veneer located in Seismic Design Category C, D, E or F shall conform to the requirements of Section 6.2.2.10 of ~~ACI 530/ASCE 5/TMS 402~~ TMS 402/ACI 530/ASCE 5. Anchored masonry veneer located in Seismic Design Category D shall also conform to the requirements of Section 6.2.2.10.3.3 of ~~ACI 530/ASCE 5/TMS 402~~ TMS 402/ACI 530/ASCE 5.

1405.9 Adhered masonry veneer. Adhered masonry veneer shall comply with the applicable requirements in Section 1405.9.1 and Sections 6.1 and 6.3 of ~~ACI 530/ASCE 5/TMS 402~~ TMS 402/ACI 530/ASCE 5.

1604.3.4 Masonry. The deflection of masonry structural members shall not exceed that permitted by ~~ACI 530/ASCE 5/TMS 402~~ TMS 402/ACI 530/ASCE 5.

1704.5 Masonry construction. Masonry construction shall be inspected and evaluated in accordance with the requirements of Sections 1704.5.1 through 1704.5.3, depending on the classification of the building or structure or nature of the occupancy, as defined by this code.

Exception: Special inspections shall not be required for:

1. Empirically designed masonry, glass unit masonry or masonry veneer designed by Section 2109, 2110 or Chapter 14, respectively, or by Chapter 5, 7 or 6 of ~~ACI 530/ASCE 5/TMS 402~~ TMS 402/ACI 530/ASCE 5, respectively, when they are part of structures classified as Occupancy Category I, II or III in accordance with Section 1604.5.
2. Masonry foundation walls constructed in accordance with Table 1805.5(1), 1805.5(2), 1805.5(3) or 1805.5(4).
3. Masonry fireplaces, masonry heaters or masonry chimneys installed or constructed in accordance with Section 2111, 2112 or 2113, respectively.

1704.5.1 Empirically designed masonry, glass unit masonry and masonry veneer in Occupancy Category IV. The minimum special inspection program for empirically designed masonry, glass unit masonry or masonry veneer designed by Section 2109, 2110 or Chapter 14, respectively, or by Chapter 5, 7 or 6 of ~~ACI 530/ASCE 5/TMS 402~~ TMS 402/ACI 530/ASCE 5, respectively, in structures classified as Occupancy Category IV, in accordance with Section 1604.5, shall comply with Table 1704.5.1.

**TABLE 1704.5.1
LEVEL 1 SPECIAL INSPECTION**

INSPECTION TASK	FREQUENCY OF INSPECTION		REFERENCE FOR CRITERIA		
	Continuous during task listed	Periodically during task listed	IBC section	ACI 530/ASCE 5/TMS 402 <u>TMS 402/ACI 530/ASCE 5^a</u>	ACI 530.1/ASCE 6/TMS 602a <u>TMS 602/ACI 530.1/ASCE 6</u>
2. The inspection program shall verify:					
a. Size and location of structural elements.	—	X	—	—	Art. 3.3G 3.3F
b. Type, size and location of anchors, including other details of anchorage of masonry to structural members, frames or other construction.	—	X	—	Sec. 1.2.2(e), 2.1.4, 3.1.6, 1.16.1	—
c. Specified size, grade and type of reinforcement	—	X	—	Sec. 4.13 1.15	Art. 2.4, 3.4
d. Welding of reinforcing bars.	X	—	—	Sec. 2.1.10.7.2 2.1.9.7.2, 3.3.3.4(b)	—

(Portions of table not shown remain unchanged)

1704.5.2 Engineered masonry in Occupancy Category I, II or III. The minimum special inspection program for masonry designed by Section 2107 or 2108 or by chapters other than Chapters 5, 6 or 7 of ~~ACI 530/ASCE 5/TMS 402~~ TMS 402/ACI 530/ASCE 5 in structures classified as Occupancy Category I, II or III, in accordance with Section 1604.5, shall comply with Table 1704.5.1.

1704.5.3 Engineered masonry in Occupancy Category IV. The minimum special inspection program for masonry designed by Section 2107 or 2108 or by chapters other than Chapters 5, 6 or 7 of ~~ACI 530/ASCE 5/TMS 402~~ TMS 402/ACI 530/ASCE 5 in structures classified as Occupancy Category IV, in accordance with Section 1604.5, shall comply with Table 1704.5.3.

**TABLE 1704.5.3
LEVEL 2 SPECIAL INSPECTION**

INSPECTION TASK	FREQUENCY OF INSPECTION		REFERENCE FOR CRITERIA		
	Continuous during task listed	Periodically during task listed	IBC section	ACI 530/ASCE 5/TMS 402 <u>TMS 402/ACI 530/ASCE 5^a</u>	ACI 530.1/ASCE 6/TMS 602a <u>TMS 530.1/ASCE 6</u>
1. From the beginning of masonry construction, the following shall be verified to ensure compliance:					
c. Placement of reinforcement, connectors and prestressing tendons and anchorages.	—	X	—	Sec. 4.13 <u>1.15</u>	Art. 3.4, 3.6A
2. The inspection program shall verify:					
a. Size and location of structural elements.	—	X	—	—	Art. 3.3G <u>3.3F</u>
b. Type, size and location of anchors, including other details of anchorage of masonry to structural members, frames or other construction.	X	—	—	Sec. 1.2.2(e), 2.1.4, 3.1.6, <u>1.16.1</u>	—
c. Specified size, grade and type of reinforcement	—	X	—	Sec. 4.13 <u>1.15</u>	Art. 2.4, 3.4
d. Welding of reinforcing bars.	X	—	—	Sec. 2.1.10.7.2 <u>2.1.9.7.2,</u> <u>3.3.3.4(b)</u>	—

(Portions of table not shown remain unchanged)

1708.1.1 Empirically designed masonry and glass unit masonry in Occupancy Category I, II or III. For masonry designed by Section 2109 or 2110 or by Chapter 5 or 7 of ~~ACI 530/ASCE 5/TMS 402~~ TMS 402/ACI 530/ASCE 5 in structures classified as Occupancy Category I, II or III, in accordance with Section 1604.5, certificates of compliance used in masonry construction shall be verified prior to construction.

1708.1.2 Empirically designed masonry and glass unit masonry in Occupancy Category IV. The minimum testing and verification prior to construction for masonry designed by Section 2109 or 2110 or by Chapter 5 or 7 of ~~ACI 530/ASCE 5/TMS 402~~ TMS 402/ACI 530/ASCE 5 in structures classified as Occupancy Category IV, in accordance with Section 1604.5, shall comply with the requirements of Table 1708.1.2.

1708.1.3 Engineered masonry in Occupancy Category I, II or III. The minimum testing and verification prior to construction for masonry designed by Section 2107 or 2108 or by chapters other than Chapter 5, 6 or 7 of ~~ACI 530/ASCE 5/TMS 402~~ TMS 402/ACI 530/ASCE 5 in structures classified as Occupancy Category I, II or III, in accordance with Section 1604.5, shall comply with Table 1708.1.2.

1708.1.4 Engineered masonry in Occupancy Category IV. The minimum testing and verification prior to construction for masonry designed by Section 2107 or 2108 or by chapters other than Chapter 5, 6 or 7 of ~~ACI 530/ASCE 5/TMS 402~~ TMS 402/ACI 530/ASCE 5 in structures classified as Occupancy Category IV, in accordance with Section 1604.5, shall comply with Table 1708.1.4.

1805.5.2.2 Masonry foundation walls. Masonry foundation walls shall comply with the following:

1. Vertical reinforcement shall have a minimum yield strength of 60,000 psi (414 MPa).

2. The specified location of the reinforcement shall equal or exceed the effective depth distance, d , noted in Tables 1805.5(2), 1805.5(3) and 1805.5(4) and shall be measured from the face of the exterior (soil) side of the wall to the center of the vertical reinforcement. The reinforcement shall be placed within the tolerances specified in ACI 530.1/ASCE 6/TMS 402, Article 3.4 B7 TMS 602/ACI 530.1/ASCE 6, Article 3.3 B.8 of the specified location.

(Portions not shown remain unchanged)

1812.7 Masonry. Where the unsupported height of foundation piers exceeds six times the least dimension, the allowable working stress on piers of unit masonry shall be reduced in accordance with ACI 530/ASCE 5/TMS 402 TMS 402/ACI 530/ASCE 5.

2101.2.2 (Supp) Strength design. Masonry designed by the strength design method shall comply with the provisions of Sections 2106 and 2108, except that autoclaved aerated concrete (AAC) masonry shall comply with the provisions of Section 2106, Section 1613.6.3 and Chapter 1 and Appendix A of ACI 530/ASCE 5/TMS 402 TMS 402/ACI 530/ASCE 5.

2101.2.3 Prestressed masonry. Prestressed masonry shall be designed in accordance with Chapters 1 and 4 of ACI 530/ASCE 5/TMS 402 TMS 402/ACI 530/ASCE 5 and Section 2106. Special inspection during construction shall be provided as set forth in Section 1704.5.

2101.2.4 Empirical design. Masonry designed by the empirical design method shall comply with the provisions of Sections 2106 and 2109 or Chapter 5 of ACI 530/ASCE 5/TMS 402 TMS 402/ACI 530/ASCE 5.

2101.2.5 Glass unit masonry. Glass unit masonry shall comply with the provisions of Section 2110 or Chapter 7 of ACI 530/ASCE 5/TMS 402 TMS 402/ACI 530/ASCE 5.

2101.2.6 Masonry veneer. Masonry veneer shall comply with the provisions of Chapter 14 or Chapter 6 of ACI 530/ASCE 5/TMS 402 TMS 402/ACI 530/ASCE 5.

2103.13.6 Prestressing tendons. Prestressing tendons shall conform to one of the following standards:

1. Wire ASTM A 421
2. Low-relaxation wire ASTM A 421
3. Strand ASTM A 416
4. Low-relaxation strand ASTM A 416
5. Bar ASTM A 722

Exceptions:

1. Wire, strands and bars not specifically listed in ASTM A 421, ASTM A 416 or ASTM A 722 are permitted, provided they conform to the minimum requirements in ASTM A 421, ASTM A 416 or ASTM A 722 and are approved by the architect/engineer.
2. Bars and wires of less than 150 kips per square inch (ksi) (1034 MPa) tensile strength and conforming to ASTM A 82, ASTM A 510, ASTM A 615, ASTM A 996 or ASTM A 706 are permitted to be used as prestressed tendons, provided that:
 - 2.1. The stress relaxation properties have been assessed by tests according to ASTM E 328 for the maximum permissible stress in the tendon.
 - 2.2. Other nonstress-related requirements of ACI 530/ASCE 5/TMS 402 TMS 402/ACI 530/ASCE 5, Chapter 4, addressing prestressing tendons are met.

2103.13.7 Corrosion protection. Corrosion protection for prestressing tendons shall comply with the requirements of ACI 530.1/ASCE 6/TMS 602 TMS 602/ACI 530.1/ASCE 6, Article 2.4G. Corrosion protection for prestressing anchorages, couplers and end blocks shall comply with the requirements of ACI 530.1/ASCE 6/TMS 602 TMS 602/ACI 530.1/ASCE 6, Article 2.4H. Corrosion protection for carbon steel accessories used in exterior wall construction or interior walls exposed to a mean relative humidity exceeding 75 percent shall comply with either Section 2103.13.7.2 or 2103.13.7.3. Corrosion protection for carbon steel accessories used in interior walls exposed to a mean relative humidity equal to or less than 75 percent shall comply with either Section 2103.13.7.1, 2103.13.7.2 or 2103.13.7.3.

2104.1 Masonry construction. Masonry construction shall comply with the requirements of Sections 2104.1.1 through 2104.5 and with ACI 530.1/ASCE 6/TMS 602 TMS 602/ACI 530.1/ASCE 6.

2104.1.1 Tolerances. Masonry, except masonry veneer, shall be constructed within the tolerances specified in ~~ACI 530.1/ASCE 6/TMS 602~~ TMS 602/ACI 530.1/ASCE 6.

2104.3 Cold weather construction. The cold weather construction provisions of ~~ACI 530.1/ASCE 6/TMS 602~~ TMS 602/ACI 530.1/ASCE 6, Article 1.8 C, or the following procedures shall be implemented when either the ambient temperature falls below 40°F (4°C) or the temperature of masonry units is below 40°F (4°C).

2104.4 Hot weather construction. The hot weather construction provisions of ~~ACI 530.1/ASCE 6/TMS 602~~ TMS 602/ACI 530.1/ASCE 6, Article 1.8 D, or the following procedures shall be implemented when the temperature or the temperature and wind-velocity limits of this section are exceeded.

2106.1 Seismic design requirements for masonry. Masonry structures and components shall comply with the requirements in Section ~~4.14.2.2~~ 1.17.4.3.2 and Section ~~4.14.3, 4.14.4, 4.14.5, 4.14.6 or 4.14.7~~ 1.17.4.1, 1.17.4.2, 1.17.4.3, 1.17.4.4, or 1.17.4.5 of ~~ACI 530/ASCE 5/TMS 402~~ TMS 402/ACI 530/ASCE 5 depending on the structure's seismic design category as determined in Section 1613. All masonry walls, unless isolated on three edges from in-plane motion of the basic structural systems, shall be considered to be part of the seismic-force-resisting system. In addition, the following requirements shall be met.

2106.1.1 Basic seismic-force-resisting system. Buildings relying on masonry shear walls as part of the basic seismic-force-resisting system shall comply with Section ~~4.14.2.2~~ 1.17.4.3.2 of ~~ACI 530/ASCE 5/TMS 402~~ TMS 402/ACI 530/ASCE 5 or with Section 2106.1.1.1, 2106.1.1.2 or 2106.1.1.3.

2. Delete without substitution as follows:

~~2106.1.1.1 Ordinary plain prestressed masonry shear walls.~~ ~~Ordinary plain prestressed masonry shear walls shall comply with the requirements of Chapter 4 of ACI 530/ASCE 5/TMS 402~~ TMS 402/ACI 530/ASCE 5.

~~2106.1.1.2 Intermediate prestressed masonry shear walls.~~ ~~Intermediate prestressed masonry shear walls shall comply with the requirements of Section 4.14.2.2.4 of ACI 530/ASCE 5/TMS 402~~ TMS 402/ACI 530/ASCE 5 and shall be designed by Chapter 4, Section 4.4.3, of ~~ACI 530/ASCE 5/TMS 402~~ TMS 402/ACI 530/ASCE 5 for flexural strength and by Section 3.3.4.1.2 of ~~ACI 530/ASCE 5/TMS 402~~ TMS 402/ACI 530/ASCE 5 for shear strength. Sections ~~4.14.2.2.5, 3.3.3.5 and 3.3.4.3.2(c)~~ of ~~ACI 530/ASCE 5/TMS 402~~ TMS 402/ACI 530/ASCE 5 shall be applicable for reinforcement. Flexural elements subjected to load reversals shall be symmetrically reinforced. The nominal moment strength at any section along a member shall not be less than one-fourth the maximum moment strength. The cross-sectional area of bonded tendons shall be considered to contribute to the minimum reinforcement in Section ~~4.14.2.2.4~~ of ~~ACI 530/ASCE 5/TMS 402~~ TMS 402/ACI 530/ASCE 5. Tendons shall be located in cells that are grouted the full height of the wall.

~~2106.1.1.3 Special prestressed masonry shear walls.~~ ~~Special prestressed masonry shear walls shall comply with the requirements of Section 4.14.2.2.5 of ACI 530/ASCE 5/TMS 402~~ TMS 402/ACI 530/ASCE 5 and shall be designed by Chapter 4, Section 4.4.3, of ~~ACI 530/ASCE 5/TMS 402~~ TMS 402/ACI 530/ASCE 5 for flexural strength and by Section 3.3.4.1.2 of ~~ACI 530/ASCE 5/TMS 402~~ TMS 402/ACI 530/ASCE 5 for shear strength. Sections ~~4.14.2.2.5(a), 3.3.3.5 and 3.3.4.3.2(c)~~ of ~~ACI 530/ASCE 5/TMS 402~~ TMS 402/ACI 530/ASCE 5 shall be applicable for reinforcement. Flexural elements subjected to load reversals shall be symmetrically reinforced. The nominal moment strength at any section along a member shall not be less than one-fourth the maximum moment strength. The cross-sectional area of bonded tendons shall be considered to contribute to the minimum reinforcement in Section ~~4.14.2.2.5~~ of ~~ACI 530/ASCE 5/TMS 402~~ TMS 402/ACI 530/ASCE 5.

~~2106.1.1.3.1 Prestressing tendons.~~ ~~Prestressing tendons shall consist of bars conforming to ASTM A 722.~~

~~2106.1.1.3.2 Grouting.~~ ~~All cells of the masonry wall shall be grouted.~~

3. Revise as follows:

2106.3 Seismic Design Category B. Structures assigned to Seismic Design Category B shall conform to the requirements of Section ~~4.14.4~~ 1.17.4.2 of ~~ACI 530/ASCE 5/TMS 402~~ TMS 402/ACI 530/ASCE 5 and to the additional requirements of this section.

2106.4 Design Category C. Structures assigned to Seismic Design Category C shall conform to the requirements of Section 2106.3, Section ~~4.14.5~~ 1.17.4.3 of ~~ACI 530/ASCE 5/TMS 402~~ TMS 402/ACI 530/ASCE 5 and the additional requirements of this section.

2106.5 Additional requirements for structures in Seismic Design Category D. Structures assigned to Seismic Design Category D shall conform to the requirements of Section 2106.4, Section 4.4.6 1.17.4.4 of ~~ACI 530/ASCE 5/TMS 402~~ TMS 402/ACI 530/ASCE 5 and the additional requirements of this section.

2106.6 Additional requirements for structures in Seismic Design Category E or F. Structures assigned to Seismic Design Category E or F shall conform to the requirements of Section 2106.5 and Section 4.4.7 1.17.4.5 of ~~ACI 530/ASCE 5/TMS 402~~ TMS 402/ACI 530/ASCE 5.

2107.1 General. The design of masonry structures using allowable stress design shall comply with Section 2106 and the requirements of Chapters 1 and 2 of ~~ACI 530/ASCE 5/TMS 402~~ TMS 402/ACI 530/ASCE 5 except as modified by Sections 2107.2 through 2107.8.

2107.2 ~~ACI 530/ASCE 5/TMS 402~~ TMS 402/ACI 530/ASCE 5, **Section 2.1.2, load combinations.** Delete Section 2.1.2.1.

2107.3 ~~ACI 530/ASCE 5/TMS 402~~ TMS 402/ACI 530/ASCE 5, **Section 2.1.3, design strength.** Delete Sections 2.1.3.4 through 2.1.3.4.3.

2107.4 ~~2107.3~~ ~~ACI 530/ASCE 5/TMS 402~~ TMS 402/ACI 530/ASCE 5, **Section 2.1.6, columns.** Add the following text to Section 2.1.6:

2.1.6.6 Light-frame construction. Masonry columns used only to support light-frame roofs of carports, porches, sheds or similar structures with a maximum area of 450 square feet (41.8 m²) assigned to Seismic Design Category A, B or C are permitted to be designed and constructed as follows:

1. Concrete masonry materials shall be in accordance with Section 2103.1 of the *International Building Code*. Clay or shale masonry units shall be in accordance with Section 2103.2 of the *International Building Code*.
2. The nominal cross-sectional dimension of columns shall not be less than 8 inches (203 mm).
3. Columns shall be reinforced with not less than one No. 4 bar centered in each cell of the column.
4. Columns shall be grouted solid.
5. Columns shall not exceed 12 feet (3658 mm) in height.
6. Roofs shall be anchored to the columns. Such anchorage shall be capable of resisting the design loads specified in Chapter 16 of the *International Building Code*.
7. Where such columns are required to resist uplift loads, the columns shall be anchored to their footings with two No. 4 bars extending a minimum of 24 inches (610 mm) into the columns and bent horizontally a minimum of 15 inches (381 mm) in opposite directions into the footings. One of these bars is permitted to be the reinforcing bar specified in Item 3 above. The total weight of a column and its footing shall not be less than 1.5 times the design uplift load.

2107.5 ~~2107.4~~ ~~ACI 530/ASCE 5/TMS 402~~ TMS 402/ACI 530/ASCE 5, **Section 2.1.10.7.1.4** 2.1.9.7.1.1, **lap splices.** Modify Section ~~2.1.10.7.1.4~~ 2.1.9.7.1.1 as follows:

~~2.1.10.7.1.4~~ 2.1.9.7.1.1 The minimum length of lap splices for reinforcing bars in tension or compression,

$$l_d = 0.002d_b f_s$$

(Equation 21-2)

For SI: $l_d = 0.29d_b f_s$

but not less than 12 inches (305 mm). In no case shall the length of the lapped splice be less than 40 bar diameters.

where:

d_b = Diameter of reinforcement, inches (mm).

f_s = Computed stress in reinforcement due to design loads, psi (MPa).

In regions of moment where the design tensile stresses in the reinforcement are greater than 80 percent of the allowable steel tension stress, F_s , the lap length of splices shall be increased not less than 50 percent of the minimum required length. Other equivalent means of stress transfer to accomplish the same 50 percent increase shall be permitted.

Where epoxy coated bars are used, lap length shall be increased by 50 percent.

2107.6 ~~2107.5~~ ~~ACI 530/ASCE 5/TMS 402~~ TMS 402/ACI 530/ASCE 5, **Section 2.1.10.7** 2.1.9.7, **splices of reinforcement.** Modify Section ~~2.1.10.7~~ 2.1.9.7 as follows:

~~2.1.10.7~~ ~~2.1.9.7~~ Splices of reinforcement. Lap splices, welded splices or mechanical splices are permitted in accordance with the provisions of this section. All welding shall conform to AWS D1.4. Reinforcement larger than No. 9 (M #29) shall be spliced using mechanical connections in accordance with Section 2.1.10.7.3.

2107.7 2107.6 ~~ACI 530/ASCE 5/TMS 402 TMS 402/ACI 530/ASCE 5~~, **Section 2.3.6, maximum bar size.** Add the following to Chapter 2:

2.3.6 Maximum bar size. The bar diameter shall not exceed one-eighth of the nominal wall thickness and shall not exceed one-quarter of the least dimension of the cell, course or collar joint in which it is placed.

2107.8 2107.7 ~~ACI 530/ASCE 5/TMS 402 TMS 402/ACI 530/ASCE 5~~, **Section 2.3.7, maximum reinforcement percentage.** Add the following text to Chapter 2:

2.3.7 Maximum reinforcement percentage. Special reinforced masonry shear walls having a shear span ratio, M/Vd , equal to or greater than 1.0 and having an axial load, P , greater than $0.05 f_m A_n$ that are subjected to in-plane forces shall have a maximum reinforcement ratio, ρ_{max} , not greater than that computed as follows:

$$\rho_{max} = \frac{nf'_m}{2f_y \left(n + \frac{f_y}{f'_m} \right)} \quad \text{(Equation 21-3)}$$

The maximum reinforcement ratio does not apply in the out-of-plane direction.

2108.1 General. The design of masonry structures using strength design shall comply with Section 2106 and the requirements of Chapters 1 and 3 of ~~ACI 530/ASCE 5/TMS 402 TMS 402/ACI 530/ASCE 5~~, except as modified by Sections 2108.2 through 2108.4.

Exception: AAC masonry shall comply with the requirements of Chapter 1 and Appendix A of ~~ACI 530/ASCE 5/TMS 402 TMS 402/ACI 530/ASCE 5~~.

2108.2 ~~ACI 530/ASCE 5/TMS 402 TMS 402/ACI 530/ASCE 5~~, **Section 3.3.3.3 development.** Add the following text to Section 3.3.3.3:

The required development length of reinforcement shall be determined by Equation (3-15), but shall not be less than 12 inches (305 mm) and need not be greater than $72 d_b$.

2108.3 ~~ACI 530/ASCE 5/TMS 402 TMS 402/ACI 530/ASCE 5~~, **Section 3.3.3.4, splices.** Modify items (b) and (c) of Section 3.3.3.4 as follows:

3.3.3.4 (b). A welded splice shall have the bars butted and welded to develop at least 125 percent of the yield strength, f_y , of the bar in tension or compression, as required. Welded splices shall be of ASTM A 706 steel reinforcement. Welded splices shall not be permitted in plastic hinge zones of intermediate or special reinforced walls or special moment frames of masonry.

3.3.3.4 (c). Mechanical splices shall be classified as Type 1 or 2 according to Section 21.2.6.1 of ACI 318. Type 1 mechanical splices shall not be used within a plastic hinge zone or within a beam-column joint of intermediate or special reinforced masonry shear walls or special moment frames. Type 2 mechanical splices are permitted in any location within a member.

2108.4 ~~ACI 530/ASCE 5/TMS 402 TMS 402/ACI 530/ASCE 5~~, **Section 3.3.3.5, maximum areas of flexural tensile reinforcement.** Add the following text to Section 3.3.3.5:

3.3.3.5.5 For special prestressed masonry shearwalls, strain in all prestressing steel shall be computed to be compatible with a strain in the extreme tension reinforcement equal to five times the strain associated with the reinforcement yield stress, f_y . The calculation of the maximum reinforcement shall consider forces in the prestressing steel that correspond to these calculated strains.

2109.1 General. Empirically designed masonry shall conform to this chapter or Chapter 5 of ~~ACI 530/ASCE 5/TMS 402 TMS 402/ACI 530/ASCE 5~~.

2109.2.3.1 Strength. Dry-stacked, surface-bonded concrete masonry walls shall be of adequate strength and proportions to support all superimposed loads without exceeding the allowable stresses listed in Table 2109.2.3.1. Allowable stresses not specified in Table 2109.2.3.1 shall comply with the requirements of ~~ACI 530/ASCE 5/TMS 402 TMS 402/ACI 530/ASCE 5~~.

2109.7.3 Floor and roof anchorage. Floor and roof diaphragms providing lateral support to masonry shall comply with the live loads in Section 1607.3 and shall be connected to the masonry in accordance with Sections 2109.7.3.1 through 2109.7.3.3. Roof loading shall be determined in accordance with Chapter 16 and, when net uplift occurs, uplift shall be resisted entirely by an anchorage system designed in accordance with the provisions of Sections 2.1 and 2.3, Sections 3.1 and 3.3 or Chapter 4 of ~~ACI 530/ASCE 5/TMS 402~~ TMS 402/ACI 530/ASCE 5.

4. Revise Chapter 35 as follows:

ACI

ACI 530-~~05~~ 08 Building Code Requirements for Masonry Structures
ACI 530.1-~~05~~ 08 Specifications for Masonry Structures

ASCE/SEI

ASCE/SEI 5-~~05~~ 08 Building Code Requirements for Masonry Structures
ASCE/SEI 6-~~05~~ 08 Specifications for Masonry Structures

TMS

TMS 402-~~05~~ 08 Building Code Requirements for Masonry Structures
TMS 602-~~05~~ 08 Specification for Masonry Structures

Reason: The purpose of this code change proposal is editorial and it updates references for the design and construction of masonry from the 2005 editions of ACI 530-05/ASCE 5-05/TMS 402-05 (Building Code Requirements for Masonry Structures) to TMS 402-08/ACI 530-08/ASCE 5-08 and ACI 530.1-05/ASCE 6-05/TMS 602-05 (Specification for Masonry Structures) to TMS 602-08/ACI 530.1-08/ASCE 6-08. This code change proposal is one of several to harmonize the design and construction requirements for masonry within the IBC with those in the reference standard. A complete list of revisions incorporated into the reference standards is available for download at www.masonrystandards.org.

With the publication of the 2008 edition of the Building Code Requirements for Masonry Structures and Specification for Masonry Structures, The Masonry Society (TMS) has become the lead sponsoring organization of the Masonry Standards Joint Committee (MSJC), which is charged with reviewing and maintaining the provisions in the referenced standards. As such, the official designation of these standards has changed from ACI 530/ASCE 5/TMS 402 to TMS 402/ACI 530/ASCE 5 and from ACI 530.1/ASCE 6/TMS 602 to TMS 602/ACI 530.1/ASCE 6 as reflected in the above proposed modifications.

Numerous sections references are proposed based on changes in the referenced standards. No intent is made to change the technical content of the IBC by these revisions. The deletion of requirements in 2106.1.1 reflect that consistent requirements have been added into the 2008 TMS 402/ACI 530/ASCE 5.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Errata: Add updates to referenced standards as follows:

ACI

ACI 530-~~05~~ 08 Building Code Requirements for Masonry Structures
ACI 530.1-~~05~~ 08 Specifications for Masonry Structures

ASCE/SEI

ASCE/SEI 5-~~05~~ 08 Building Code Requirements for Masonry Structures
ASCE/SEI 6-~~05~~ 08 Specifications for Masonry Structures

TMS

TMS 402-~~05~~ 08 Building Code Requirements for Masonry Structures
TMS 602-~~05~~ 08 Specification for Masonry Structures

Committee Action:

Approved as Modified

Modify proposal as follows:

2106.1 Seismic design requirements for masonry. Masonry structures and components shall comply with the requirements in Section ~~4.4.7.4.3.2~~ 1.17.2 and 1.17.3 and 1.17.4.1, 1.17.4.2, 1.17.4.3, 1.17.4.4, or 1.17.4.5 of TMS 402/ACI 530/ASCE 5 depending on the structure's seismic design category as determined in Section 1613. All masonry walls, unless isolated on three edges from in-plane motion of the basic structural systems, shall be considered to be part of the seismic-force-resisting system. In addition, the following requirements shall be met.

2106.1.1 Basic seismic-force-resisting system. Buildings relying on masonry shear walls as part of the basic seismic-force-resisting system shall comply with Section ~~1.17.4.3.2~~ 1.17.3.2 of TMS 402/ACI 530/ASCE 5 or with Section 2106.1.1.1, 2106.1.1.2 or 2106.1.1.3.

(Portions of proposal not shown remain unchanged)

Committee Reason: These revisions to the masonry code requirements are necessary to maintain consistency with the latest edition of the MSJC code and specification. The modification correlates section references with the published version of the standard.

Assembly Action:

None

Final Hearing Results

S174-07/08

AM

Code Change No: **S175-07/08**

Original Proposal

Sections: 2101.2.2 through 2101.3, 2102, 2103.8, Table 2103.8(1), Table 2103.8(2), 2103.11, 2103.11.1 through 2103.12, 2103.13, 2103.13.1 through 2103.13.8, 2104.1 through 2104.1.2, 2104.1.2.1 through 2104.1.2.7, 2104.1.5, 2104.1.7 through 2104.1.8, 2104.2, 2104.3, 2104.3.1 through 2104.3.3.5, 2104.4, 2104.4.1 through 2104.5, 2105.2.2.1.1, Table 2105.2.2.1.1, 2105.2.2.1.2, 2105.2.2.1.3, 2106.1, 2106.1.1 through 2106.6, 2107.1, 2107.2, 2107.4, 2107.5, 2107.6, 2107.7, 2107.8, 2108.1 through 2108.3, 2310.8.4, 2109(New) through 2110 (New), Chapter 35

Proponent: Jason Thompson, National Concrete Masonry Association, representing Masonry Alliance for Codes and Standards

1. Revise as follows:

2101.2.2 (Supp) Strength design. Masonry designed by the strength design method shall comply with the provisions of Sections 2106 and 2108, except that autoclaved aerated concrete (AAC) masonry shall comply with the provisions of Section 2106, Section 1613.6.3 and Chapter 1 and Appendix A of TMS 402/ACI 530/ASCE 5.

2101.2.3 Prestressed masonry. Prestressed masonry shall be designed in accordance with Chapters 1 and 4 of ~~ACI 530/ASCE 5/TMS 402~~ TMS 402/ACI 530/ASCE 5 and Section 2106. Special inspection during construction shall be provided as set forth in Section 1704.5.

2101.2.4 Empirical design. Masonry designed by the empirical design method shall comply with the provisions of Sections 2106 and 2109 or Chapter 5 of ~~ACI 530/ASCE 5/TMS 402~~ TMS 402/ACI 530/ASCE 5.

2101.2.5 Glass unit masonry. Glass unit masonry shall comply with the provisions of Section 2110 or Chapter 7 of ~~ACI 530/ASCE 5/TMS 402~~ TMS 402/ACI 530/ASCE 5.

2101.2.6 Masonry veneer. Masonry veneer shall comply with the provisions of Chapter 14 or Chapter 6 of ~~ACI 530/ASCE 5/TMS 402~~ TMS 402/ACI 530/ASCE 5.

2101.3 Construction documents. The construction documents shall show all of the items required by this code including the following:

1. Specified size, grade, type and location of reinforcement, anchors and wall ties.
2. Reinforcing bars to be welded and welding procedure.
3. Size and location of structural elements.
4. Provisions for dimensional changes resulting from elastic deformation, creep, shrinkage, temperature and moisture.
5. Loads used in the design of masonry.
6. Specified compressive strength of masonry at stated ages or stages of construction for which masonry is designed, except where specifically exempted by this code.
7. Details of anchorage of masonry to structural members, frames, and other construction, including the type, size, and location of connectors.
8. Size and location of conduits, pipes, and sleeves.
9. The minimum level of testing and inspection as defined in Chapter 17, or an itemized testing and inspection program that meets or exceeds the requirements of Chapter 17.

2. Delete without substitution:

SECTION 2102
DEFINITIONS AND NOTATIONS

BOND REINFORCING. The adhesion between steel reinforcement and mortar or grout.

BUTTRESS. A projecting part of a masonry wall built integrally therewith to provide lateral stability.

COLUMN, MASONRY. An isolated vertical member whose horizontal dimension measured at right angles to its thickness does not exceed three times its thickness and whose height is at least four times its thickness.

COMPOSITE ACTION. Transfer of stress between components of a member designed so that in resisting loads, the combined components act together as a single member.

COMPOSITE MASONRY. Multiwythe masonry members acting with composite action.

DIAPHRAGM. A roof or floor system designed to transmit lateral forces to shear walls or other lateral load-resisting elements.

EFFECTIVE HEIGHT. For braced members, the effective height is the clear height between lateral supports and is used for calculating the slenderness ratio. The effective height for unbraced members is calculated in accordance with engineering mechanics.

HEADER (Bonder). A masonry unit that connects two or more adjacent wythes of masonry.

MEAN DAILY TEMPERATURE. The average daily temperature of temperature extremes predicted by a local weather bureau for the next 24 hours.

PLASTIC HINGE. The zone in a structural member in which the yield moment is anticipated to be exceeded under loading combinations that include earthquakes.

3. Revise as follows:

NOTATIONS

A_n = Net cross-sectional area of masonry, square inches (mm^2).

b = Effective width of rectangular member or width of flange for T and I sections, inches (mm).

f_y = Specified yield stress of the reinforcement or the anchor bolt, psi (MPa).

L_w = Length of wall, inches (mm).

l_{de} = Embedment length of reinforcement, inches (mm).

P_w = Weight of wall tributary to section under consideration, pounds (N).

t = Specified wall thickness dimension or the least lateral dimension of a column, inches (mm).

V_n = Nominal shear strength, pounds (N).

V_u = Required shear strength due to factored loads, pounds (N).

W = Wind load, or related internal moments in forces.

γ = Reinforcement size factor.

ρ_n = Ratio of distributed shear reinforcement on plane perpendicular to plane of A_{mv} .

ρ_{max} = Maximum reinforcement ratio.

ϕ = Strength reduction factor.

P = The applied load at failure, pounds (N).

S_l = Thickness of the test specimen measured parallel to the direction of load, inches (mm).

S_w = Width of the test specimen measured parallel to the loading cylinder, inches (mm).

2103.8 Mortar. Mortar for use in masonry construction shall conform to ASTM C 270 and shall conform to the proportion specifications of Table 2103.8(1) or the property specifications of Table 2103.8(2). Type S or N mortar conforming to ASTM C 270 shall be used for glass unit masonry. The amount of water used in mortar for glass unit masonry shall be adjusted to account for the lack of absorption. Retempering of mortar for glass unit masonry shall not be permitted after initial set. Unused mortar shall be discarded within 2½ hours after initial mixing, except that unused mortar for glass unit masonry shall be discarded within 1½ hours after initial mixing.

4. Delete without substitution:

**TABLE 2103.8(1)
MORTAR PROPORTIONS**

MORTAR	TYPE	PROPORTIONS BY VOLUME (cementitious materials)							HYDRATED LIME ^e OR LIME PUTTY	AGGREGATE MEASURED IN A DAMP, LOOSE CONDITION
		Portland cement ^a or blended cement ^b	Mortar cement ^d			Masonry cement ^e				
			M	S	N	M	S	N		
Cement-Lime	M	1	—	—	—	—	—	—	over $\frac{1}{4}$ to $\frac{1}{2}$ over $\frac{1}{2}$ to $1\frac{1}{4}$ over $1\frac{1}{4}$ to $2\frac{1}{2}$	Not less than $2\frac{1}{4}$ and not more than 3 times the sum of the separate volumes of cementitious materials
	S	1	—	—	—	—	—	—		
	N	1	—	—	—	—	—	—		
	O	1	—	—	—	—	—	—		
Mortar Cement	M	1	—	—	1	—	—	—		
	S	—	1	—	—	—	—	—		
	S	$\frac{1}{2}$	—	—	1	—	—	—		
	S	—	—	1	—	—	—	—		
	N	—	—	—	1	—	—	—		
Masonry Cement	M	1	—	—	—	—	—	1		
	S	—	—	—	—	—	—	—		
	S	$\frac{1}{2}$	—	—	—	—	—	—		
	S	—	—	—	—	—	4	—		
	N	—	—	—	—	—	—	4		
O	—	—	—	—	—	—	4			

- a. Portland cement conforming to the requirements of ASTM C 150.
- b. Blended cement conforming to the requirements of ASTM C 595.
- c. Masonry cement conforming to the requirements of ASTM C 91.
- d. Mortar cement conforming to the requirements of ASTM C 1329.
- e. Hydrated lime conforming to the requirements of ASTM C 207.

**TABLE 2103.8(2)
MORTAR PROPERTIES^a**

MORTAR	TYPE	AVERAGE COMPRESSIVE ^b STRENGTH AT 28 DAYS minimum (psi)	WATER RETENTION minimum (%)	AIR CONTENT maximum (%)
Cement-Lime	M	2,500	75	12
	S	1,800	75	12
	N	750	75	14 ^c
	O	350	75	14 ^c
Mortar Cement	M	2,500	75	12
	S	1,800	75	12
	N	750	75	14 ^c
	O	350	75	14 ^c
Masonry Cement	M	2,500	75	18
	S	1,800	75	18
	N	750	75	20 ^d
	O	350	75	20 ^d

For SI: 1 inch = 25.4 mm, 1 pound per square inch = 6.895kPa.

- a. This aggregate ratio (measured in damp, loose condition) shall not be less than $2\frac{1}{4}$ and not more than 3 times the sum of the separate volumes of cementitious materials.
- b. Average of three 2-inch cubes of laboratory-prepared mortar, in accordance with ASTM C 270.
- c. When structural reinforcement is incorporated in cement-lime or mortar cement mortars, the maximum air content shall not exceed 12 percent.
- d. When structural reinforcement is incorporated in masonry cement mortar, the maximum air content shall not exceed 18 percent.

5. Revise as follows:

2103.11 Mortar for AAC masonry. Thin-bed mortar for AAC masonry shall comply with Article 2.1 C.1 of TMS 602/ACI 530.1/ASCE 6 Section 2103.11.1. Mortar for leveling courses of AAC masonry shall comply with Section 2103.11.2. Mortar used for the leveling courses of AAC masonry shall comply with Article 2.1 C.2 of TMS 602/ACI 530.1/ASCE 6.

6. Delete without substitution:

2103.11.1 Thin-bed mortar for AAC masonry. Thin-bed mortar for AAC masonry shall be specifically manufactured for use with AAC masonry. Testing to verify mortar properties shall be conducted by the thin-bed mortar manufacturer and confirmed by an independent testing agency:

1. ~~The compressive strength of thin-bed mortar, as determined by ASTM C 109, shall meet or exceed the strength of the AAC masonry units.~~
2. ~~The shear strength of thin-bed mortar shall meet or exceed the shear strength of the AAC masonry units for wall assemblages tested in accordance with ASTM E 519.~~
3. ~~The flexural tensile strength of thin-bed mortar shall not be less than the modulus of rupture of the masonry units. Flexural strength shall be determined by testing in accordance with ASTM E 72 (transverse load test), ASTM E 518 Method A (flexural bond strength test) or ASTM C 1072 (flexural bond strength test).~~
 - 3.1. ~~For conducting flexural strength tests in accordance with ASTM E 518, at least five test specimens shall be constructed as stack-bonded prisms at least 32 inches (810 mm) high. The type of mortar specified by the AAC unit manufacturer shall be used.~~
 - 3.2. ~~For flexural strength tests in accordance with ASTM C 1072, test specimens shall be constructed as stack-bonded prisms comprised with at least three bed joints. A total of at least five joints shall be tested using the type of mortar specified by the AAC unit manufacturer.~~
4. ~~The splitting tensile strength of AAC masonry assemblages composed of two AAC masonry units bonded with one thin-bed mortar joint shall be determined in accordance with ASTM C 1006 and shall equal or exceed $2.4 \sqrt{f_{AAC}}$.~~

7. Revise as follows:

2103.12 Grout. Grout shall comply with Article 2.1 C.1 of TMS 602/ACI 530.1/ASCE 6, conform to Table 2103.12 or to ASTM C 476. When grout conforms to ASTM C 476, the grout shall be specified by proportion requirements or property requirements.

8. Delete without substitution:

2103.12 Grout. Grout shall conform to Table 2103.12 or to ASTM C 476. When grout conforms to ASTM C 476, the grout shall be specified by proportion requirements or property requirements.

**TABLE 2103.12
GROUT PROPORTIONS BY VOLUME FOR
MASONRY CONSTRUCTION**

TYPE	PARTS BY VOLUME OF PORTLAND CEMENT OR BLENDED CEMENT	PARTS BY VOLUME OF HYDRATED LIME OR LIME PUTTY	AGGREGATE, MEASURED IN A DAMP, LOOSE CONDITION	
			Fine	Coarse
Fine Grout	4	$0\frac{1}{40}$	$2\frac{1}{4}$ —3 times the sum of the volumes of the cementitious materials	—
Coarse Grout	4	$0\frac{1}{40}$	$2\frac{1}{4}$ —3 times the sum of the volumes of the cementitious materials	1—2 times the sum of the volumes of the cementitious materials

9. Revise as follows:

2103.13 Metal reinforcement and accessories. Metal reinforcement and accessories shall conform to Sections 2103.13.1 through 2103.13.8 Article 2.4 of TMS 602/ACI 530.1/ASCE 6 Where unidentified reinforcement is approved for use, not less than three tension and three bending tests shall be made on representative specimens of the reinforcement from each shipment and grade of reinforcing steel proposed for use in the work.

10. Delete without substitutions:

2103.13.1 Deformed reinforcing bars. Deformed reinforcing bars shall conform to one of the following standards: ASTM A 615 for deformed and plain billet steel bars for concrete reinforcement; ASTM A 706 for low-alloy steel deformed bars for concrete reinforcement; ASTM A 767 for zinc-coated reinforcing steel bars; ASTM A 775 for epoxy-coated reinforcing steel bars; and ASTM A 996 for rail and axle steel deformed bars for concrete reinforcement.

2103.13.2 Joint reinforcement. Joint reinforcement shall comply with ASTM A 951. The maximum spacing of cross wires in ladder-type joint reinforcement and point of connection of cross wires to longitudinal wires of truss-type reinforcement shall be 16 inches (400 mm).

2103.13.3 Deformed reinforcing wire. Deformed reinforcing wire shall conform to ASTM A 496.

2103.13.4 Wire fabric. Wire fabric shall conform to ASTM A 185 for plain steel welded wire fabric for concrete reinforcement or ASTM A 497 for welded deformed steel wire fabric for concrete reinforcement.

2103.13.5 Anchors, ties and accessories. Anchors, ties and accessories shall conform to the following standards: ASTM A 36 for structural steel; ASTM A 82 for plain steel wire for concrete reinforcement; ASTM A 185 for plain steel welded wire fabric for concrete reinforcement; ASTM A 240 for chromium and chromium-nickel stainless steel plate, sheet and strip; ASTM A 307 Grade A for anchor bolts; ASTM A 480 for flat rolled stainless and heat resisting steel plate, sheet and strip; and ASTM A 1008 for cold-rolled carbon steel sheet.

2103.13.6 Prestressing tendons. Prestressing tendons shall conform to one of the following standards:

1. Wire—ASTMA421
2. Low relaxation wire—ASTMA421
3. Strand—ASTMA416
4. Low relaxation strand—ASTMA416
5. Bar—ASTMA722

Exceptions:

1. Wire, strands and bars not specifically listed in ASTM A 421, ASTM A 416 or ASTM A 722 are permitted, provided they conform to the minimum requirements in ASTM A 421, ASTM A 416 or ASTM A 722 and are approved by the architect/engineer.
2. Bars and wires of less than 150 kips per square inch (ksi) (1034 MPa) tensile strength and conforming to ASTM A 82, ASTM A 510, ASTM A 615, ASTM A 996 or ASTM A 706 are permitted to be used as prestressed tendons, provided that:
 - 2.1. The stress relaxation properties have been assessed by tests according to ASTM E 328 for the maximum permissible stress in the tendon.
 - 2.2. Other nonstress-related requirements of ACI 530/ASCE 5/TMS 402, Chapter 4, addressing prestressing tendons are met.

2103.13.7 Corrosion protection. Corrosion protection for prestressing tendons shall comply with the requirements of ACI 530.1/ASCE 6/TMS 602, Article 2.4G. Corrosion protection for prestressing anchorages, couplers and end blocks shall comply with the requirements of ACI 530.1/ASCE 6/TMS 602, Article 2.4H. Corrosion protection for carbon steel accessories used in exterior wall construction or interior walls exposed to a mean relative humidity exceeding 75 percent shall comply with either Section 2103.13.7.2 or 2103.13.7.3. Corrosion protection for carbon steel accessories used in interior walls exposed to a mean relative humidity equal to or less than 75 percent shall comply with either Section 2103.13.7.1, 2103.13.7.2 or 2103.13.7.3.

2103.13.7.1 Mill galvanized. Mill galvanized coatings shall be applied as follows:

1. For joint reinforcement, wall ties, anchors and inserts, a minimum coating of 0.1 ounce per square foot (31g/m^2) complying with the requirements of ASTM A 641 shall be applied.
2. For sheet metal ties and sheet metal anchors, a minimum coating complying with Coating Designation G-60 according to the requirements of ASTM A 653 shall be applied.
3. For anchor bolts, steel plates or bars not exposed to the earth, weather or a mean relative humidity exceeding 75 percent, a coating is not required.

2103.13.7.2 Hot-dipped galvanized. Hot-dipped galvanized coatings shall be applied after fabrication as follows:

1. For joint reinforcement, wall ties, anchors and inserts, a minimum coating of 1.5 ounces per square foot (458g/m^2) complying with the requirements of ASTM A 153, Class B shall be applied.
2. For sheet metal ties and anchors, the requirements of ASTM A 153, Class B shall be met.
3. For steel plates and bars, the requirements of either ASTM A 123 or ASTM A 153, Class B shall be met.

2103.13.7.3 Epoxy coatings. Carbon steel accessories shall be epoxy coated as follows:

1. For joint reinforcement, the requirements of ASTM A 884, Class A, Type 1 having a minimum thickness of 7 mils (175 μm) shall be met.
2. For wire ties and anchors, the requirements of ASTM A 899, Class C having a minimum thickness of 20 mils (508 μm) shall be met.
3. For sheet metal ties and anchors, a minimum thickness of 20 mils (508 μm) per surface shall be provided or a minimum thickness in accordance with the manufacturer's specification shall be provided.

2103.13.8 Tests. Where unidentified reinforcement is approved for use, not less than three tension and three bending tests shall be made on representative specimens of the reinforcement from each shipment and grade of reinforcing steel proposed for use in the work.

11. Revise as follows:

2104.1 Masonry construction. Masonry construction shall comply with the requirements of Sections 2104.1.1 through 2104.5 and with ACI 530.1/ASCE 6/TMS 602 TMS 602/ACI 530.1/ASCE 6.

2104.1.1 Tolerances. Masonry, except masonry veneer, shall be constructed within the tolerances specified in ACI 530.1/ASCE 6/TMS 602 TMS 602/ACI 530.1/ASCE 6.

2104.1.2 Placing mortar and units. Placement of mortar, grout, and clay, concrete, glass, and AAC masonry and concrete units shall comply with Sections 2104.1.2.1, 2104.1.2.2, 2104.1.2.3 and 2104.1.2.5. Placement of mortar and glass unit masonry shall comply with Sections 2104.1.2.4 and 2104.1.2.5. Placement of thin bed mortar and AAC masonry shall comply with Section 2104.1.2.6 TMS 602/ACI 530.1/ASCE 6.

12. Delete without substitution:

2104.1.2.1 Bed and head joints. Unless otherwise required or indicated on the construction documents, head and bed joints shall be $\frac{3}{8}$ inch (9.5 mm) thick, except that the thickness of the bed joint of the starting course placed over foundations shall not be less than $\frac{1}{4}$ inch (6.4 mm) and not more than $\frac{1}{4}$ inch (19.1 mm).

2104.1.2.1.1 Open-end units. Open-end units with beveled ends shall be fully grouted. Head joints of open-end units with beveled ends need not be mortared. The beveled ends shall form a grout key that permits grouts within $\frac{5}{8}$ inch (15.9 mm) of the face of the unit. The units shall be tightly butted to prevent leakage of the grout.

2104.1.2.2 Hollow units. Hollow units shall be placed such that face shells of bed joints are fully mortared. Webs shall be fully mortared in all courses of piers, columns, pilasters, in the starting course on foundations where adjacent cells or cavities are to be grouted, and where otherwise required. Head joints shall be mortared a minimum distance from each face equal to the face shell thickness of the unit.

2104.1.2.3 Solid units. Unless otherwise required or indicated on the construction documents, solid units shall be placed in fully mortared bed and head joints. The ends of the units shall be completely buttered. Head joints shall not be filled by slushing with mortar. Head joints shall be constructed by shoving mortar tight against the adjoining unit. Bed joints shall not be furrowed deep enough to produce voids.

2104.1.2.4 Glass unit masonry. Glass units shall be placed so head and bed joints are filled solidly. Mortar shall not be furrowed. Unless otherwise required, head and bed joints of glass unit masonry shall be $\frac{1}{4}$ inch (6.4 mm) thick, except that vertical joint thickness of radial panels shall not be less than $\frac{1}{8}$ inch (3.2 mm). The bed joint thickness tolerance shall be minus $\frac{1}{16}$ inch (1.6 mm) and plus $\frac{1}{8}$ inch (3.2 mm). The head joint thickness tolerance shall be plus or minus $\frac{1}{8}$ inch (3.2 mm).

2104.1.2.5 Placement in mortar. Units shall be placed while the mortar is soft and plastic. Any unit disturbed to the extent that the initial bond is broken after initial positioning shall be removed and relaid in fresh mortar.

2104.1.2.6 Thin bed mortar and AAC masonry units. AAC masonry construction shall begin with a leveling course of masonry meeting the requirements of Section 2104.1.2. Subsequent courses of AAC masonry units shall be laid with thin bed mortar using a special notched trowel manufactured for use with thin bed mortar to spread the mortar so that it completely fills the bed joints. Unless otherwise specified, the head joints shall be similarly filled. Joints in AAC masonry shall be approximately $\frac{1}{16}$ inch (1.5 mm) and shall be formed by striking on the ends and tops of AAC masonry units with a rubber mallet. Minor adjustments in unit position shall be made while the mortar is still soft and plastic by tapping it into the proper position. Minor sanding of the exposed faces of AAC masonry shall be permitted to provide a smooth and plumb surface.

~~2104.1.2.7 Grouted masonry.~~ Between grout pours, a horizontal construction joint shall be formed by stopping all wythes at the same elevation and with the grout stopping a minimum of $1\frac{1}{2}$ inches (38 mm) below a mortar joint, except at the top of the wall. Where bond beams occur, the grout pour shall be stopped a minimum of $\frac{1}{2}$ inch (12.7 mm) below the top of the masonry.

13. Revise as follows:

~~2104.1.3 Installation of wall ties.~~ The ends of wall ties shall be embedded in mortar joints. Wall tie ends shall engage outer face shells of hollow units by at least $\frac{1}{2}$ inch (12.7 mm). Wire wall ties shall be embedded at least $1\frac{1}{2}$ inches (38 mm) into the mortar bed of solid masonry units or solid-grouted hollow units. Wall ties shall not be bent after being embedded in grout or mortar. Wall ties shall be installed in accordance with TMS 602/ACI 530.1/ASCE 6.

2104.1.5 Lintels. The design for lintels shall be in accordance with the masonry design provisions of either Section 2107 or 2108. Minimum length of end support shall be 4 inches (102 mm).

14. Delete without substitution:

~~2104.1.7 Masonry protection.~~ The top of unfinished masonry work shall be covered to protect the masonry from the weather.

~~2104.1.8 Weep holes.~~ Weep holes provided in the outside wythe of masonry walls shall be at a maximum spacing of 33 inches (838 mm) on center (o.c.). Weep holes shall not be less than $\frac{3}{16}$ inch (4.8 mm) in diameter.

15. Delete and substitute as follows:

~~2104.2 Corbeled masonry.~~ Except for corbels designed per Section 2107 or 2108, the following shall apply:

- ~~1. Corbels shall be constructed of solid masonry units.~~
- ~~2. The maximum corbeled projection beyond the face of the wall shall not exceed:~~
 - ~~2.1. One-half of the wall thickness for multiwythe walls bonded by mortar or grout and wall ties or masonry headers or~~
 - ~~2.2. One-half the wythe thickness for single wythe walls, masonry bonded hollow walls, multiwythe walls with open collar joints and veneer walls.~~
- ~~3. The maximum projection of one unit shall not exceed:~~
 - ~~3.1. One-half the nominal unit height of the unit or~~
 - ~~3.2. One-third the nominal thickness of the unit or wythe.~~
- ~~4. The back surface of the corbelled section shall remain within 1 inch (25 mm) of plane.~~

2104.2 Corbeled masonry. Corbeled masonry shall comply with the requirements of Section 1.12 of TMS 402/ACI 530/ASCE 5.

16. Revise as follows:

2104.3 Cold weather construction. The cold weather construction provisions of ACI 530.1/ASCE 6/TMS 602 TMS 602/ACI 530.1/ASCE 6, Article 1.8 C, or the following procedures shall be implemented when either the ambient temperature falls below 40°F (4°C) or the temperature of masonry units is below 40°F (4°C).

17. Delete without substitution:

~~2104.3.1 Preparation.~~

- ~~1. Temperatures of masonry units shall not be less than 20°F (-7°C) when laid in the masonry. Masonry units containing frozen moisture, visible ice or snow on their surface shall not be laid.~~
- ~~2. Visible ice and snow shall be removed from the top surface of existing foundations and masonry to receive new construction. These surfaces shall be heated to above freezing, using methods that do not result in damage.~~

~~2104.3.2 Construction.~~ The following requirements shall apply to work in progress and shall be based on ambient temperature.

2104.3.2.1 Construction requirements for temperatures between 40°F (4°C) and 32°F (0°C). The following construction requirements shall be met when the ambient temperature is between 40°F (4°C) and 32°F (0°C):

1. ~~Glass unit masonry shall not be laid.~~
2. ~~Water and aggregates used in mortar and grout shall not be heated above 140°F (60°C).~~
3. ~~Mortar sand or mixing water shall be heated to produce mortar temperatures between 40°F (4°C) and 120°F (49°C) at the time of mixing. When water and aggregates for grout are below 32°F (0°C), they shall be heated.~~

2104.3.2.2 Construction requirements for temperatures between 32°F (0°C) and 25°F (-4°C). The requirements of Section 2104.3.2.1 and the following construction requirements shall be met when the ambient temperature is between 32°F (0°C) and 25°F (-4°C):

1. ~~The mortar temperature shall be maintained above freezing until used in masonry.~~
2. ~~Aggregates and mixing water for grout shall be heated to produce grout temperature between 70°F (21°C) and 120°F (49°C) at the time of mixing. Grout temperature shall be maintained above 70°F (21°C) at the time of grout placement.~~
3. ~~Heat AAC masonry units to a minimum temperature of 40°F (4°C) before installing thin-bed mortar.~~

2104.3.2.3 Construction requirements for temperatures between 25°F (-4°C) and 20°F (-7°C). The requirements of Sections 2104.3.2.1 and 2104.3.2.2 and the following construction requirements shall be met when the ambient temperature is between 25°F (-4°C) and 20°F (-7°C):

1. ~~Masonry surfaces under construction shall be heated to 40°F (4°C).~~
2. ~~Wind breaks or enclosures shall be provided when the wind velocity exceeds 15 miles per hour (mph) (24 km/h).~~
3. ~~Prior to grouting, masonry shall be heated to a minimum of 40°F (4°C).~~

2104.3.2.4 Construction requirements for temperatures below 20°F (-7°C). The requirements of Sections 2104.3.2.1, 2104.3.2.2 and 2104.3.2.3 and the following construction requirement shall be met when the ambient temperature is below 20°F (-7°C): Enclosures and auxiliary heat shall be provided to maintain air temperature within the enclosure to above 32°F (0°C).

2104.3.3 Protection. The requirements of this section and Sections 2104.3.3.1 through 2104.3.3.5 apply after the masonry is placed and shall be based on anticipated minimum daily temperature for grouted masonry and anticipated mean daily temperature for ungrouted masonry.

2104.3.3.1 Glass unit masonry. The temperature of glass unit masonry shall be maintained above 40°F (4°C) for 48 hours after construction.

2104.3.3.2 AAC masonry. The temperature of AAC masonry shall be maintained above 32°F (0°C) for the first 4 hours after thin-bed mortar application.

2104.3.3.3 Protection requirements for temperatures between 40°F (4°C) and 25°F (-4°C). When the temperature is between 40°F (4°C) and 25°F (-4°C), newly constructed masonry shall be covered with a weather-resistive membrane for 24 hours after being completed.

2104.3.3.4 Protection requirements for temperatures between 25°F (-4°C) and 20°F (-7°C). When the temperature is between 25°F (-4°C) and 20°F (-7°C), newly constructed masonry shall be completely covered with weather-resistive insulating blankets, or equal protection, for 24 hours after being completed. The time period shall be extended to 48 hours for grouted masonry, unless the only cement in the grout is Type III portland cement.

2104.3.3.5 Protection requirements for temperatures below 20°F (-7°C). When the temperature is below 20°F (-7°C), newly constructed masonry shall be maintained at a temperature above 32°F (0°C) for at least 24 hours after being completed by using heated enclosures, electric heating blankets, infrared lamps or other acceptable methods. The time period shall be extended to 48 hours for grouted masonry, unless the only cement in the grout is Type III portland cement.

18. Revise as follows:

2104.4 Hot weather construction. The hot weather construction provisions of ACI 530.1/ASCE 6/TMS 602 TMS 602/ACI 530.1/ASCE 6, Article 1.8 D, or the following procedures shall be implemented when the temperature or the temperature and wind-velocity limits of this section are exceeded ambient air temperature exceeds 100°F (37.8°C), or exceeds 90°F (32.2°C) with a wind velocity greater than 8 mph (12.9 km/hr).

19. Delete without substitution:

2104.4.1 Preparation. The following requirements shall be met prior to conducting masonry work.

2104.4.1.1 Temperature. When the ambient temperature exceeds 100°F (38°C), or exceeds 90°F (32°C) with a wind velocity greater than 8 mph (3.5 m/s):

1. ~~Necessary conditions and equipment shall be provided to produce mortar having a temperature below 120°F (49°C).~~
2. ~~Sand piles shall be maintained in a damp, loose condition.~~

2104.4.1.2 Special conditions. When the ambient temperature exceeds 115°F (46°C), or 105°F (40°C) with a wind velocity greater than 8 mph (3.5 m/s), the requirements of Section 2104.4.1.1 shall be implemented, and materials and mixing equipment shall be shaded from direct sunlight.

2104.4.2 Construction. The following requirements shall be met while masonry work is in progress.

2104.4.2.1 Temperature. When the ambient temperature exceeds 100°F (38°C), or exceeds 90°F (32°C) with a wind velocity greater than 8 mph (3.5 m/s):

1. ~~The temperature of mortar and grout shall be maintained below 120°F (49°C).~~
2. ~~Mixers, mortar transport containers and mortar boards shall be flushed with cool water before they come into contact with mortar ingredients or mortar.~~
3. ~~Mortar consistency shall be maintained by retempering with cool water.~~
4. ~~Mortar shall be used within 2 hours of initial mixing.~~
5. ~~Thin-bed mortar shall be spread no more than 4 feet (1219 mm) ahead of AAC masonry units.~~
6. ~~AAC masonry units shall be placed within one minute after spreading thin-bed mortar.~~

2104.4.2.2 Special conditions. When the ambient temperature exceeds 115°F (46°C), or exceeds 105°F (40°C) with a wind velocity greater than 8 mph (3.5 m/s), the requirements of Section 2104.4.2.1 shall be implemented and cool mixing water shall be used for mortar and grout. The use of ice shall be permitted in the mixing water prior to use. Ice shall not be permitted in the mixing water when added to the other mortar or grout materials.

2104.4.3 Protection. When the mean daily temperature exceeds 100°F (38°C) or exceeds 90°F (32°C) with a wind velocity greater than 8 mph (3.5 m/s), newly constructed masonry shall be fog sprayed until damp at least three times a day until the masonry is three days old.

2104.5 Wetting of brick. Brick (clay or shale) at the time of laying shall require wetting if the unit's initial rate of water absorption exceeds 30 grams per 30 square inches (19 355 mm²) per minute or 0.035 ounce per square inch (1 g/645mm²) per minute, as determined by ASTM C 67.

20. Revise as follows:

2105.2.2.1.1 Clay masonry. The compressive strength of masonry shall be determined based on the strength of the units and the type of mortar specified using Table 2105.2.2.1.1, provided:

1. ~~Units conform to~~ are sampled and tested to verify conformance with ASTM C 62, ASTM C 216 or ASTM C 652.
2. Thickness of bed joints does not exceed 5/8 inch (15.9 mm).
3. For grouted masonry, the grout meets one of the following requirements:
 - 3.1. Grout conforms to ~~ASTM C 476 Article 2.2 of TMS 602/ACI 530.1/ASCE 6.~~
 - 3.2. Minimum grout compressive strength equals or exceeds f_m but not less than 2,000 psi (13.79MPa). The compressive strength of grout shall be determined in accordance with ASTM C 1019.

**TABLE 2105.2.2.1.1
COMPRESSIVE STRENGTH OF CLAY MASONRY**

NET AREA COMPRESSIVE STRENGTH OF CLAY MASONRY UNITS (psi)		NET AREA COMPRESSIVE STRENGTH OF MASONRY (psi)
Type M or S mortar	Type N mortar	
1,700	2,100	1,000
3,350	4,150	1,500
4,950	6,200	2,000
6,600	8,250	2,500
8,250	10,300	3,000
9,900	—	3,500
13,200/11,500	—	4,000

For SI: 1 pound per square inch = 0.00689MPa.

2105.2.2.1.2 Concrete masonry. The compressive strength of masonry shall be determined based on the strength of the unit and type of mortar specified using Table 2105.2.2.1.2, provided:

1. Units conform to are sampled and tested to verify conformance with ASTM C 55 or ASTM C 90 and are sampled and tested in accordance with ASTM C 140.
2. Thickness of bed joints does not exceed $\frac{5}{8}$ inch (15.9 mm).
3. For grouted masonry, the grout meets one of the following requirements:
 - 3.1. Grout conforms to ASTM C 476 Article 2.2 of TMS 602/ACI 530.1/ASCE 6.
 - 3.2. Minimum grout compressive strength equals or exceeds f_m but not less than 2,000 psi (13.79 MPa). The compressive strength of grout shall be determined in accordance with ASTM C 1019.

2105.2.2.1.3 AAC masonry. The compressive strength of AAC masonry shall be based on the strength of the AAC masonry unit only and the following shall be met:

1. Units conform to ASTM C 1386.
2. Thickness of bed joints does not exceed 1/8 inch (3.2 mm).
3. For grouted masonry, the grout meets one of the following requirements:
 - 3.1. Grout conforms to ASTM C 476 Article 2.2 of TMS 602/ACI 530.1/ASCE 6.
 - 3.2. Minimum grout compressive strength equals or exceeds f_{AAC} but not less than 2,000 psi (13.79 MPa). The compressive strength of grout shall be determined in accordance with ASTM C 1019.

21. Delete and substitute:

2106.1 Seismic design requirements for masonry. Masonry structures and components shall comply with the requirements in Section 1.14.2.2 and Section 1.14.3, 1.14.4, 1.14.5, 1.14.6 or 1.14.7 of ACI 530/ASCE 5/TMS 402 depending on the structure's seismic design category as determined in Section 1613. All masonry walls, unless isolated on three edges from in-plane motion of the basic structural systems, shall be considered to be part of the seismic force-resisting system. In addition, the following requirements shall be met.

2106.1 Seismic design requirements for masonry. Masonry structures and components shall comply with the requirements in Section 1.17 of TMS 402/ACI 530/ASCE 5 depending on the structure's seismic design category as determined in Section 1613.

22. Delete without substitution:

2106.1.1 Basic seismic force-resisting system. Buildings relying on masonry shear walls as part of the basic seismic force-resisting system shall comply with Section 1.14.2.2 of ACI 530/ASCE 5/TMS 402 or with Section 2106.1.1.1, 2106.1.1.2 or 2106.1.1.3.

2106.1.1.1 Ordinary plain prestressed masonry shear walls. Ordinary plain prestressed masonry shear walls shall comply with the requirements of Chapter 4 of ACI 530/ASCE 5/TMS 402.

2106.1.1.2 Intermediate prestressed masonry shear walls. Intermediate prestressed masonry shear walls shall comply with the requirements of Section 1.14.2.2.4 of ACI 530/ASCE 5/TMS 402 and shall be designed by Chapter 4, Section 4.4.3, of ACI 530/ASCE 5/TMS 402 for flexural strength and by Section 3.3.4.1.2 of ACI 530/ASCE 5/TMS 402 for shear strength. Sections 1.14.2.2.5, 3.3.3.5 and 3.3.4.3.2(c) of ACI 530/ASCE 5/TMS 402 shall be applicable

for reinforcement. Flexural elements subjected to load reversals shall be symmetrically reinforced. The nominal moment strength at any section along a member shall not be less than one-fourth the maximum moment strength. The cross-sectional area of bonded tendons shall be considered to contribute to the minimum reinforcement in Section 1.14.2.2.4 of ACI 530/ASCE 5/TMS 402. Tendons shall be located in cells that are grouted the full height of the wall.

2106.1.1.3 Special prestressed masonry shear walls. Special prestressed masonry shear walls shall comply with the requirements of Section 1.14.2.2.5 of ACI 530/ASCE 5/TMS 402 and shall be designed by Chapter 4, Section 4.4.3, of ACI 530/ASCE 5/TMS 402 for flexural strength and by Section 3.3.4.1.2 of ACI 530/ASCE 5/TMS 402 for shear strength. Sections 1.14.2.2.5(a), 3.3.3.5 and 3.3.4.3.2(c) of ACI 530/ASCE 5/TMS 402 shall be applicable for reinforcement. Flexural elements subjected to load reversals shall be symmetrically reinforced. The nominal moment strength at any section along a member shall not be less than one-fourth the maximum moment strength. The cross-sectional area of bonded tendons shall be considered to contribute to the minimum reinforcement in Section 1.14.2.2.5 of ACI 530/ASCE 5/TMS 402.

2106.1.1.3.1 Prestressing tendons. Prestressing tendons shall consist of bars conforming to ASTM A 722.

2106.1.1.3.2 Grouting. All cells of the masonry wall shall be grouted.

2106.2 Anchorage of masonry walls. Masonry walls shall be anchored to the roof and floors that provide lateral support for the wall in accordance with Section 1604.8.2.

2106.3 Seismic Design Category B. Structures assigned to Seismic Design Category B shall conform to the requirements of Section 1.14.4 of ACI 530/ASCE 5/TMS 402 and to the additional requirements of this section.

2106.3.1 Masonry walls not part of the lateral force-resisting system. Masonry partition walls, masonry screen walls and other masonry elements that are not designed to resist vertical or lateral loads, other than those induced by their own mass, shall be isolated from the structure so that the vertical and lateral forces are not imparted to these elements. Isolation joints and connectors between these elements and the structure shall be designed to accommodate the design story drift.

2106.4 Additional requirements for structures in Seismic Design Category C. Structures assigned to Seismic Design Category C shall conform to the requirements of Section 2106.3, Section 1.14.5 of ACI 530/ASCE 5/TMS 402 and the additional requirements of this section.

2106.4.1 Design of discontinuous members that are part of the lateral force-resisting system. Columns and pilasters that are part of the lateral force-resisting system and that support reactions from discontinuous stiff members such as walls shall be provided with transverse reinforcement spaced at no more than one-fourth of the least nominal dimension of the column or pilaster. The minimum transverse reinforcement ratio shall be 0.0015. Beams supporting reactions from discontinuous walls or frames shall be provided with transverse reinforcement spaced at no more than one-half of the nominal depth of the beam. The minimum transverse reinforcement ratio shall be 0.0015.

2106.5 Additional requirements for structures in Seismic Design Category D. Structures assigned to Seismic Design Category D shall conform to the requirements of Section 2106.4, Section 1.14.6 of ACI 530/ASCE 5/TMS 402 and the additional requirements of this section.

2106.5.1 Loads for shear walls designed by the allowable stress design method. When calculating in-plane shear or diagonal tension stresses by the allowable stress design method, shear walls that resist seismic forces shall be designed to resist 1.5 times the seismic forces required by Chapter 16. The 1.5 multiplier need not be applied to the overturning moment.

2106.5.2 Shear wall shear strength. For a shear wall whose nominal shear strength exceeds the shear corresponding to development of its nominal flexural strength, two shear regions exist.

For all cross sections within a region defined by the base of the shear wall and a plane at a distance L_w above the base of the shear wall, the nominal shear strength shall be determined by Equation 21-1.

$$V_n = A_{vn} f_y$$

(Equation 21-1)

The required shear strength for this region shall be calculated at a distance $L_w/2$ above the base of the shear wall, but not to exceed one-half story height. For the other region, the nominal shear strength of the shear wall shall be determined from Section 2108.

2106.6 Additional requirements for structures in Seismic Design Category E or F. Structures assigned to Seismic Design Category E or F shall conform to the requirements of Section 2106.5 and Section 1.14.7 of ACI 530/ASCE 5/TMS 402.

23. Revise as follows:

2107.1 General. The design of masonry structures using allowable stress design shall comply with Section 2106 and the requirements of Chapters 1 and 2 of ACI 530/ASCE 5/TMS 402 TMS 402/ACI 530/ASCE 5 except as modified by Sections 2107.2 through ~~2107.8~~ 2107.5.

2107.2 ACI 530/ASCE 5/TMS 402 TMS 402/ACI 530/ASCE 5, Section 2.1.2, load combinations. Delete Section 2.1.2.1.

24. Delete without substitution:

2107.3 ACI 530/ASCE 5/TMS 402, Section 2.1.3, design strength. Delete Sections 2.1.3.4 through 2.1.3.4.3.

2107.4 ACI 530/ASCE 5/TMS 402, Section 2.1.6, columns. Add the following text to Section 2.1.6:
2.1.6.6 Light frame construction. Masonry columns used only to support light frame roofs of carports, porches, sheds or similar structures with a maximum area of 450 square feet (41.8 m²) assigned to Seismic Design Category A, B or C are permitted to be designed and constructed as follows:

1. Concrete masonry materials shall be in accordance with Section 2103.1 of the *International Building Code*.
Clay or shale masonry units shall be in accordance with Section 2103.2 of the *International Building Code*.
2. The nominal cross-sectional dimension of columns shall not be less than 8 inches (203 mm).
3. Columns shall be reinforced with not less than one No. 4 bar centered in each cell of the column.
4. Columns shall be grouted solid.
5. Columns shall not exceed 12 feet (3658 mm) in height.
6. Roofs shall be anchored to the columns. Such anchorage shall be capable of resisting the design loads specified in Chapter 16 of the *International Building Code*.
7. Where such columns are required to resist uplift loads, the columns shall be anchored to their footings with two No. 4 bars extending a minimum of 24 inches (610 mm) into the columns and bent horizontally a minimum of 15 inches (381 mm) in opposite directions into the footings. One of these bars is permitted to be the reinforcing bar specified in Item 3 above. The total weight of a column and its footing shall not be less than 1.5 times the design uplift load.

25. Revise as follows:

2107.5 ~~2107.3~~ ACI 530/ASCE 5/TMS 402 TMS 402/ACI 530/ASCE 5, Section 2.1.10.7.1.1, lap splices. Modify Section 2.1.10.7.1.4 2.1.9.7.1.1 as follows:

~~2.1.10.7.1.4~~ 2.1.9.7.1.1 The minimum length of lap splices for reinforcing bars in tension or compression, l_d , shall be

$$l_d = 0.002d_b f_s \quad \text{(Equation 21-2 ~~21-1~~)}$$

For SI: $l_d = 0.29d_b f_s$

but not less than 12 inches (305 mm). In no case shall the length of the lapped splice be less than 40 bar diameters.

where:

d_b = Diameter of reinforcement, inches (mm).

f_s = Computed stress in reinforcement due to design loads, psi (MPa).

In regions of moment where the design tensile stresses in the reinforcement are greater than 80 percent of the allowable steel tension stress, F_s , the lap length of splices shall be increased not less than 50 percent of the minimum required length. Other equivalent means of stress transfer to accomplish the same 50 percent increase shall be permitted. Where epoxy coated bars are used, lap length shall be increased by 50 percent.

~~2107.6~~ ~~2107.4~~ ~~ACI 530/ASCE 5/TMS 402~~ TMS 402/ACI 530/ASCE 5, Section 2.1.10.7 ~~2.1.9.7~~, splices of reinforcement. Modify Section 2.1.10.7 as follows:

2.1.10.7 ~~2.1.9.7~~ Splices of reinforcement. Lap splices, welded splices or mechanical splices are permitted in accordance with the provisions of this section. All welding shall conform to AWS D1.4. Welded splices shall be of ASTM A 706 steel reinforcement. Reinforcement larger than No. 9 (M #29) shall be spliced using mechanical connections in accordance with Section 2.1.10.7.3.

~~2107.7~~ ~~2107.5~~ ~~ACI 530/ASCE 5/TMS 402~~ TMS 402/ACI 530/ASCE 5, Section 2.3.6, maximum bar size. Add the following to Chapter 2:

2.3.6 Maximum bar size. The bar diameter shall not exceed one-eighth of the nominal wall thickness and shall not exceed one-quarter of the least dimension of the cell, course or collar joint in which it is placed.

26. Delete without substitution:

~~2107.8~~ ~~ACI 530/ASCE 5/TMS 402~~, Section 2.3.7, maximum reinforcement percentage. Add the following text to Chapter 2:

2.3.7 Maximum reinforcement percentage. Special reinforced masonry shear walls having a shear span ratio, M/Vd , equal to or greater than 1.0 and having an axial load, P , greater than $0.05 f_m A_n$, that are subjected to in-plane forces shall have a maximum reinforcement ratio, ρ_{max} , not greater than that computed as follows:

$$\rho_{max} = \frac{n f'_m}{2 f_y \left(n + \frac{f_y}{f'_m} \right)} \quad \text{(Equation 21-3)}$$

The maximum reinforcement ratio does not apply in the out-of-plane direction.

27. Revise as follows:

2108.1 General. The design of masonry structures using strength design shall comply with Section 2106 and the requirements of Chapters 1 and 3 of ~~ACI 530/ASCE 5/TMS 402~~ TMS 402/ACI 530/ASCE 5, except as modified by Sections 2108.2 through 2108.4.

Exception: AAC masonry shall comply with the requirements of Chapter 1 and Appendix A of ~~ACI 530/ASCE 5/TMS 402~~ TMS 402/ACI 530/ASCE 5.

~~2108.2~~ ~~ACI 530/ASCE 5/TMS 402~~ TMS 402/ACI 530/ASCE 5, Section 3.3.3.3 development. Add the following text to Section 3.3.3.3:

The required development length of reinforcement shall be determined by Equation (3-15), but shall not be less than 12 inches (305 mm) and need not be greater than $72 d_b$.

~~2108.3~~ ~~ACI 530/ASCE 5/TMS 402~~ TMS 402/ACI 530/ASCE 5, Section 3.3.3.4, splices. Modify items (b) and (c) of Section 3.3.3.4 as follows:

3.3.3.4 (b). A welded splice shall have the bars butted and welded to develop at least 125 percent of the yield strength, f_y , of the bar in tension or compression, as required. Welded splices shall be of ASTM A 706 steel reinforcement. Welded splices shall not be permitted in plastic hinge zones of intermediate or special reinforced walls or special moment frames of masonry. 3.3.3.4 (c). Mechanical splices shall be classified as Type 1 or 2 according to Section 21.2.6.1 of ACI 318. Type 1 mechanical splices shall not be used within a plastic hinge zone or within a beam-column joint of intermediate or special reinforced masonry shear walls or special moment frames. Type 2 mechanical splices are permitted in any location within a member.

28. Delete without substitution:

~~2108.4~~ ~~ACI 530/ASCE 5/TMS 402~~, Section 3.3.3.5, maximum areas of flexural tensile reinforcement. Add the following text to Section 3.3.3.5:

~~3.3.3.5.5 For special prestressed masonry shear walls, strain in all prestressing steel shall be computed to be compatible with a strain in the extreme tension reinforcement equal to five times the strain associated with the reinforcement yield stress, f_y . The calculation of the maximum reinforcement shall consider forces in the prestressing steel that correspond to these calculated strains.~~

29. Delete Section 2109 in its entirety and substitute as follows:

SECTION 2109
EMPIRICAL DESIGN OF MASONRY

2109.1 General. Empirically designed masonry shall conform to the requirements of Chapter 5 of TMS 402/ACI 530/ASCE 5, except where otherwise noted in this section.

2109.1.1 Limitations. The use of empirical design of masonry shall be limited as noted in Section 5.1.2 of TMS 402/ACI 530/ASCE 5. In buildings that exceed one or more of the limitations of Section 5.1.2 of TMS 402/ACI 530/ASCE 5, masonry shall be designed in accordance with the engineered design provisions of Section 2101.2.1, 2101.2.2, or 2101.2.3 or the foundation wall provisions of Section 1805.5.

2109.2 Surface-bonded walls. Dry-stacked, surface-bonded concrete masonry walls shall comply with the requirements of Chapter 5 of TMS 402/ACI 530/ASCE 5, except where otherwise noted in this section.

2109.2.1 Strength. Dry-stacked, surface-bonded concrete masonry walls shall be of adequate strength and proportions to support all superimposed loads without exceeding the allowable stresses listed in Table 2109.2.1. Allowable stresses not specified in Table 2109.2.1 shall comply with the requirements of TMs 402/ACI 530/ASCE 5.

TABLE 2109.2.1
ALLOWABLE STRESS GROSS CROSS-SECTIONAL AREA
FOR DRY-STACKED, SURFACE-BONDED CONCRETE MASONRY WALLS

<u>DESCRIPTION</u>	<u>MAXIMUM ALLOWABLE STRESS (psi)</u>
Compression standard block	45
Flexural tension	
Horizontal span	30
Vertical span	18
Shear	10

For SI: 1 pound per square inch = 0.006895MPa.

2109.2.2 Construction. Construction of dry-stacked, surface-bonded masonry walls, including stacking and leveling of units, mixing and application of mortar and curing and protection shall comply with ASTM C 946.

2109.3 Adobe construction. Adobe construction shall comply with this section and shall be subject to the requirements of this code for Type V construction, Chapter 5 of TMS 402/ACI 530/ASCE 5, and this section.

2109.3.1 Unstabilized adobe.

2109.3.1.1 Compressive strength. Adobe units shall have an average compressive strength of 300 psi (2068 kPa) when tested in accordance with ASTM C 67. Five samples shall be tested and no individual unit is permitted to have a compressive strength of less than 250 psi (1724 kPa).

2109.3.1.2 Modulus of rupture. Adobe units shall have an average modulus of rupture of 50 psi (345 kPa) when tested in accordance with the following procedure. Five samples shall be tested and no individual unit shall have a modulus of rupture of less than 35 psi (241 kPa).

2109.3.1.2.1 Support conditions. A cured unit shall be simply supported by 2-inch-diameter (51 mm) cylindrical supports located 2 inches (51 mm) in from each end and extending the full width of the unit.

2109.3.1.2.2 Loading conditions. A 2-inch-diameter (51 mm) cylinder shall be placed at midspan parallel to the supports.

2109.3.1.2.3 Testing procedure. A vertical load shall be applied to the cylinder at the rate of 500 pounds per minute (37 N/s) until failure occurs.

2109.3.1.2.4 Modulus of rupture determination. The modulus of rupture shall be determined by the equation:

$$f_r = 3 PL_s / 2S_w (S_t^2) \quad \text{(Equation 21-2)}$$

where, for the purposes of this section only:

S_w = Width of the test specimen measured parallel to the loading cylinder, inches (mm).

f_r = Modulus of rupture, psi (MPa).

L_s = Distance between supports, inches (mm).

S_t = Thickness of the test specimen measured parallel to the direction of load, inches (mm).

P = The applied load at failure, pounds (N).

2109.3.1.3 Moisture content requirements. Adobe units shall have a moisture content not exceeding 4 percent by weight.

2109.3.1.4 Shrinkage cracks. Adobe units shall not contain more than three shrinkage cracks and any single shrinkage crack shall not exceed 3 inches (76 mm) in length or 1/8 inch (3.2 mm) in width.

2109.3.2 Stabilized adobe.

2109.3.2.1 Material requirements. Stabilized adobe shall comply with the material requirements of unstabilized adobe in addition to Sections 2109.3.2.1.1 and 2109.3.2.1.2.

2109.3.2.1.1 Soil requirements. Soil used for stabilized adobe units shall be chemically compatible with the stabilizing material.

2109.3.2.1.2 Absorption requirements. A 4-inch (102 mm) cube, cut from a stabilized adobe unit dried to a constant weight in a ventilated oven at 212°F to 239°F (100°C to 115°C), shall not absorb more than 2 1/2 percent moisture by weight when placed upon a constantly water-saturated, porous surface for seven days. A minimum of five specimens shall be tested and each specimen shall be cut from a separate unit.

2109.3.3 Allowable stress. The allowable compressive stress based on gross cross-sectional area of adobe shall not exceed 30 psi (207 kPa).

2109.3.3.1 Bolts. Bolt values shall not exceed those set forth in Table 2109.3.3.1.

**TABLE 2109.3.3.1
ALLOWABLE SHEAR ON BOLTS IN ADOBE MASONRY**

DIAMETER OF BOLTS (inches)	MINIMUM EMBEDMENT (inches)	SHEAR (pounds)
1/2		
5/8	12	200
3/4	15	300
7/8	18	400
1	21	500
1 1/8	24	600

For SI: 1 inch = 25.4 mm, 1 pound = 4.448 N.

2109.3.4 Construction.

2109.3.4.1 General.

2109.3.4.1.1 Height restrictions. Adobe construction shall be limited to buildings not exceeding one story, except that two-story construction is allowed when designed by a registered design professional.

2109.3.4.1.2 Mortar restrictions. Mortar for stabilized adobe units shall comply with Chapter 21 or adobe soil. Adobe soil used as mortar shall comply with material requirements for stabilized adobe. Mortar for unstabilized adobe shall be portland cement mortar.

2109.3.4.1.3 Mortar joints. Adobe units shall be laid with full head and bed joints and in full running bond.

2109.3.4.1.4 Parapet walls. Parapet walls constructed of adobe units shall be waterproofed.

2109.3.4.2 Wall thickness. The minimum thickness of exterior walls in one-story buildings shall be 10 inches (254 mm). The walls shall be laterally supported at intervals not exceeding 24 feet (7315 mm). The minimum thickness of interior load-bearing walls shall be 8 inches (203 mm). In no case shall the unsupported height of any wall constructed of adobe units exceed 10 times the thickness of such wall.

2109.3.4.3 Foundations.

2109.3.4.3.1 Foundation support. Walls and partitions constructed of adobe units shall be supported by foundations or footings that extend not less than 6 inches (152 mm) above adjacent ground surfaces and are constructed of solid masonry (excluding adobe) or concrete. Footings and foundations shall comply with Chapter 18.

2109.3.4.3.2 Lower course requirements. Stabilized adobe units shall be used in adobe walls for the first 4 inches (102 mm) above the finished first-floor elevation.

2109.3.4.4 Isolated piers or columns. Adobe units shall not be used for isolated piers or columns in a load-bearing capacity. Walls less than 24 inches (610 mm) in length shall be considered isolated piers or columns.

2109.3.4.5 Tie beams. Exterior walls and interior load-bearing walls constructed of adobe units shall have a continuous tie beam at the level of the floor or roof bearing and meeting the following requirements.

2109.3.4.5.1 Concrete tie beams. Concrete tie beams shall be a minimum depth of 6 inches (152 mm) and a minimum width of 10 inches (254 mm). Concrete tie beams shall be continuously reinforced with a minimum of two No. 4 reinforcing bars. The ultimate compressive strength of concrete shall be at least 2,500 psi (17.2 MPa) at 28 days.

2109.3.4.5.2 Wood tie beams. Wood tie beams shall be solid or built up of lumber having a minimum nominal thickness of 1 inch (25 mm), and shall have a minimum depth of 6 inches (152 mm) and a minimum width of 10 inches (254 mm). Joints in wood tie beams shall be spliced a minimum of 6 inches (152 mm). No splices shall be allowed within 12 inches (305 mm) of an opening. Wood used in tie beams shall be approved naturally decay-resistant or pressure-treated wood.

2109.3.4.6 Exterior finish. Exterior walls constructed of unstabilized adobe units shall have their exterior surface covered with a minimum of two coats of portland cement plaster having a minimum thickness of 3/4 inch (19.1 mm) and conforming to ASTM C 926. Lathing shall comply with ASTM C 1063. Fasteners shall be spaced at 16 inches (406 mm) o.c. maximum. Exposed wood surfaces shall be treated with an approved wood preservative or other protective coating prior to lath application.

2109.3.4.7 Lintels. Lintels shall be considered structural members and shall be designed in accordance with the applicable provisions of Chapter 16.

30. Delete Section 2110 in its entirety and substitute as follows:

SECTION 2110 **GLASS UNIT MASONRY**

2110.1 General. Glass unit masonry construction shall comply with Chapter 7 of TMS 402/ACI 530/ASCE 5 and this section.

2110.1.1 Limitations. Solid or hollow approved glass block shall not be used in fire walls, party walls, fire barriers, fire partitions or smoke barriers, or for load-bearing construction. Such blocks shall be erected with mortar and reinforcement in metal channel-type frames, structural frames, masonry or concrete recesses, embedded panel anchors as provided for both exterior and interior walls or other approved joint materials. Wood strip framing shall not be used in walls required to have a fire-resistance rating by other provisions of this code.

Exceptions:

1. Glass-block assemblies having a fire protection rating of not less than 3/4 hour shall be permitted as opening protectives in accordance with Section 715 in fire barriers, fire partitions, and smoke barriers that have a required fire-resistance rating of 1 hour or less and do not enclose exit stairways, exit ramps, or exit passageways.
2. Glass-block assemblies as permitted in Section 404.5, Exception 2.

31. Revise Chapter 35 as follows:

ACI

ACI 530-~~05~~ 08 Building Code Requirements for Masonry Structures

ACI 530.1-~~05~~ 08 Specifications for Masonry Structures

ASCE/SEI

ASCE/SEI 5-~~05~~ 08 Building Code Requirements for Masonry Structures

ASCE/SEI 6-~~05~~ 08 Specifications for Masonry Structures

TMS

TMS 402-~~05~~ 08 Building Code Requirements for Masonry Structures

TMS 602-~~05~~ 08 Specification for Masonry Structures

Reason: The primary purpose of this code change proposal is to update the existing reference standards for the design and construction of masonry from the 2005 editions to the 2008 editions. The revisions proposed in this code change, while relatively minor in nature, reflect revisions incorporated into the 2008 edition of the Building Code Requirements for Masonry Structures and Specification for Masonry Structures. This code change proposal is one of several to harmonize the design and construction requirements for masonry within the IBC with those in the reference standard. A complete list of revisions incorporated into the referenced standards is available for download at www.masonrystandards.org.

An editorial change to the titles of ACI 530.1 and ASCE/SEI 6 as shown in Chapter 35 is also proposed.

With the publication of the 2008 edition of the Building Code Requirements for Masonry Structures and Specification for Masonry Structures, The Masonry Society (TMS) has become the lead sponsoring organization of the Masonry Standards Joint Committee (MSJC), which is charged with reviewing and maintaining the provisions in the referenced standards. As such, the official designation of these standards has changed from ACI 530/ASCE 5/TMS 402 to TMS 402/ACI 530/ASCE 5 and from ACI 530.1/ASCE 6/TMS 602 to TMS 602/ACI 530.1/ASCE 6 as reflected in the above proposed modifications.

The additional information proposed to be included in Section 2101.3 simply reflect revisions to the reference standards regarding the minimum information to be included on the construction documents. The proposed additions are consistent in intent with existing requirements in Chapters 1 and 16 as well as other material chapters.

The remainder of the changes proposed herein remove provisions transcribed into the IBC from the MSJC standards. While this series of changes may appear substantive, it is instead intended to be editorial as the provisions proposed for removal are already contained in the reference standards. For several years the ICC has been moving toward removing provisions transcribed into the body of the I-Codes, and where applicable, referencing a governing standard. This change proposes just that, with the one exception related to Section 2105. The provisions of this section are retained for the benefit of inspectors and regulators.

Some have voiced a concern in the past that by removing provisions from the IBC it forces them to purchase numerous reference standards. In the case of the masonry design and construction provisions, this statement would be true regardless of whether the transcribed provisions proposed to be removed by this change proposal were accepted or not as only a very small fraction of the MSJC provisions are transcribed. It can be argued that maintaining the transcribed provisions in the current form is a disservice to the safety and welfare of the general public; who may assume or are told that this Chapter contains to complete body of information related to masonry construction, materials, and design. Whether one assumes the role of contractor, designer, building official, inspector, plan checker, or specifier, they still must have the reference document to perform their tasks.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Errata: Add updates to referenced standards as follows:

ACI

ACI 530-~~05~~08 Building Code Requirements for Masonry Structures

ACI 530.1-~~05~~08 Specifications for Masonry Structures

ASCE/SEI

ASCE/SEI 5-~~05~~08 Building Code Requirements for Masonry Structures

ASCE/SEI 6-~~05~~08 Specifications for Masonry Structures

TMS

TMS 402-~~05~~08 Building Code Requirements for Masonry Structures

TMS 602-~~05~~08 Specification for Masonry Structures

Committee Action:

Approved as Modified

Modify proposal as follows:

2103.12 Grout. Grout shall comply with Article ~~2-4-C-4~~ 2.2 of TMS 602/ACI 530.1/ASCE 6.

(Portions of proposal not shown remain unchanged)

Committee Reason: These revisions to the masonry code requirements are necessary to maintain consistency with the latest edition of the MSJC code and specification and this approval is consistent with other actions concerning updates to the masonry provisions. This proposal appropriately maintains masonry QC requirements in the IBC. The modification correlates section references with the published version of the

standard. The committee has a concern with item 8 in Section 2102.3, requiring the size and location of conduits, pipes and sleeves to be shown on the construction documents. Some believe this could have unintended consequences and hope the MSJC can address this item. The committee also indicated that should a conflict arise as a result of another masonry related code change, it is the committee's preference that this proposal should govern.

Assembly Action:

None

Final Hearing Results

S175-07/08

AM

Code Change No: S176-07/08

Original Proposal

Sections: 2101.2, 2101.3, Chapter 35

Proponent: Jason Thompson, National Concrete Masonry Association, representing Masonry Alliance for Codes and Standards

1. Revise as follows:

2101.2.2 (Supp) Strength design. Masonry designed by the strength design method shall comply with the provisions of Sections 2106 and 2108, except that AAC masonry shall comply with the provisions of Section 2106, Section 1613.6.3, and Chapter 1 and Appendix A of TMS 402/ACI 530/ASCE 5/TMS 402.

2101.2.3 Prestressed masonry. Prestressed masonry shall be designed in accordance with Chapters 1 and 4 of TMS 402/ACI 530/ASCE 5/TMS 402 and Section 2106. Special inspection during construction shall be provided as set forth in Section 1704.5.

2101.2.4 Empirical design. Masonry designed by the empirical design method shall comply with the provisions of Sections 2106 and 2109 or Chapter 5 of TMS 402/ACI 530/ASCE 5/TMS 402.

2101.2.5 Glass unit masonry. Glass unit masonry shall comply with the provisions of Section 2110 or Chapter 7 of TMS 402/ACI 530/ASCE 5/TMS 402.

2101.2.6 Masonry veneer. Masonry veneer shall comply with the provisions of Chapter 14 or Chapter 6 of TMS 402/ACI 530/ASCE 5/TMS 402.

2101.3 Construction documents. The construction documents shall show all of the items required by this code including the following:

1. Specified size, grade, type and location of reinforcement, anchors and wall ties.
2. Reinforcing bars to be welded and welding procedure.
3. Size and location of structural elements.
4. Provisions for dimensional changes resulting from elastic deformation, creep, shrinkage, temperature and moisture.
5. Loads used in the design of masonry.
6. Specified compressive strength of masonry at stated ages or stages of construction for which masonry is designed, except where specifically exempted by this code.
7. Details of anchorage of masonry to structural members, frames, and other construction, including the type, size, and location of connectors.
8. Size and location of conduits, pipes, and sleeves.
9. The minimum level of testing and inspection as defined in Chapter 17, or an itemized testing and inspection program that meets or exceeds the requirements of Chapter 17.

2. Revise Chapter 35 as follows:

ACI

ACI 530-05 08 Building Code Requirements for Masonry Structures
ACI 530.1-05 08 Specifications for Masonry Structures

ASCE/SEI

ASCE/SEI 5-05 08 Building Code Requirements for Masonry Structures
ASCE/SEI 6-05 08 Specifications for Masonry Structures

TMS

TMS 402-05 08 Building Code Requirements for Masonry Structures
TMS 602-05 08 Specification for Masonry Structures

Reason: The primary purpose of this code change proposal is to update the existing reference standards for the design and construction of masonry from the 2005 editions to the 2008 editions. The revisions proposed in this code change, while relatively minor in nature, reflect revisions incorporated into the 2008 edition of the Building Code Requirements for Masonry Structures and Specification for Masonry Structures. This code change proposal is one of several to harmonize the design and construction requirements for masonry within the IBC with those in the reference standard. A complete list of revisions incorporated into the referenced standards is available for download at www.masonrystandards.org.

An editorial change to the titles of ACI 530.1 and ASCE/SEI 6 as shown in Chapter 35 is also proposed.

With the publication of the 2008 edition of the Building Code Requirements for Masonry Structures and Specification for Masonry Structures, The Masonry Society (TMS) has become the lead sponsoring organization of the Masonry Standards Joint Committee (MSJC), which is charged with reviewing and maintaining the provisions in the referenced standards. As such, the official designation of these standards has changed from ACI 530/ASCE 5/TMS 402 to TMS 402/ACI 530/ASCE 5 and from ACI 530.1/ASCE 6/TMS 602 to TMS 602/ACI 530.1/ASCE 6 as reflected in the above proposed modifications.

The additional information proposed to be included in Section 2101.3 simply reflect revisions to the reference standards regarding the minimum information to be included on the construction documents. The proposed additions are consistent in intent with existing requirements in Chapters 1 and 16 as well as other material chapters.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Errata: Add updates to referenced standards as follows:

ACI

ACI 530-0508 Building Code Requirements for Masonry Structures

ASCE/SEI

ASCE/SEI 5-0508 Building Code Requirements for Masonry Structures

TMS

TMS 402-0508 Building Code Requirements for Masonry Structures

Committee Action:

Approved as Submitted

Committee Reason: These revisions to Section 2101 are necessary to maintain consistency with the latest edition of the MSJC code.

Assembly Action:

None

Final Hearing Results

S176-07/08

AS

Code Change No: **S177-07/08**

Original Proposal

Sections: 2103.2, 2103.8, Table 2103.8(2), 2103.13 (New), 2103.13.4, 2106.13.6, Chapter 35 (New)

Proponent: Jason Thompson, National Concrete Masonry Association, representing Masonry Alliance for Codes and Standards

1. Revise as follows:

2103.2 (Supp) Clay or shale masonry units. Clay or shale masonry units shall conform to the following standards: ASTM C 34 for structural clay load-bearing wall tile; ASTM C 56 for structural clay nonload-bearing wall tile; ASTM C 62 for building brick (solid masonry units made from clay or shale); ASTM C 1088 for solid units of thin veneer brick; ASTM C 126 for ceramic-glazed structural clay facing tile, facing brick and solid masonry units; ASTM C 212 for structural clay facing tile; ASTM C 216 for facing brick (solid masonry units made from clay or shale); ASTM C 652 for hollow brick (hollow masonry units made from clay or shale); ~~and~~ or ASTM C 1405 for glazed brick (single-fired solid brick units).

Exception: Structural clay tile for nonstructural use in fireproofing of structural members and in wall furring shall not be required to meet the compressive strength specifications. The fire-resistance rating shall be determined in accordance with ASTM E 119 or UL 263 and shall comply with the requirements of Table 602.

2103.8 Mortar. Mortar for use in masonry construction shall conform to ASTM C 270 ~~and~~ or shall conform to the proportion specifications of Table 2103.8(1) or the property specifications of Table 2103.8(2). Type S or N mortar conforming to ASTM C 270 shall be used for glass unit masonry. The amount of water used in mortar for glass unit masonry shall be adjusted to account for the lack of absorption. Retempering of mortar for glass unit masonry shall not be permitted after initial set. Unused mortar shall be discarded within 2½ hours after initial mixing, except that unused mortar for glass unit masonry shall be discarded within 1½ hours after initial mixing.

TABLE 2103.8(2) MORTAR PROPERTIES^a

For SI: 1 inch = 25.4 mm, 1 pound per square inch = 6.895kPa.

- a. This aggregate ratio (measured in damp, loose condition) shall not be less than 21/4 and not more than ~~3~~ 3½ times the sum of the separate volumes of cementitious materials.
- b. Average of three 2-inch cubes of laboratory-prepared mortar, in accordance with ASTM C 270.
- c. When structural reinforcement is incorporated in cement-lime or mortar cement mortars, the maximum air content shall not exceed 12 percent.
- d. When structural reinforcement is incorporated in masonry cement mortar, the maximum air content shall not exceed 18 percent.

(Portions of table not shown remain unchanged)

2103.13 Self-consolidating grout. Materials used in self-consolidating grout shall conform to ASTM C 476. The minimum compressive strength of self-consolidating grout shall be 2,000 psi (13.79 MPa) at 28 days when tested in accordance with ASTM C 1019. Self-consolidating grout shall have a slump flow of 24 in. to 30 in. (610 mm to 762 mm) determined in accordance with ASTM C 1611. The Visual Stability Index (VSI) of self-consolidating grout shall be less than or equal to 1 when determined in accordance with ASTM C 1611, Appendix X.1. The addition of admixtures to self-consolidating grout in the field shall not be permitted. Self-consolidating grout shall not be used in AAC masonry construction unless the requirements of Article 1.6 E of TMS 602/ACI 530.1/ASCE 6 are met.

(Renumber subsequent sections)

~~2103.13.4~~ **2103.14.4 Welded wire fabric.** Welded wire fabric shall conform to ASTM A 185 for plain steel-welded wire fabric for concrete reinforcement or ASTM A 497 for welded deformed steel wire fabric for concrete reinforcement.

~~2103.13.6~~ **2103.14.6 Prestressing tendons.** Prestressing tendons shall conform to one of the following standards:

1. Wire ASTM A 421
2. Low-relaxation wire ASTM A 421
3. Strand ASTM A 416
4. Low-relaxation strand ASTM A 416
5. Bar ASTM A 722

Exceptions:

1. Wire, strands and bars not specifically listed in ASTM A 421, ASTM A 416 or ASTM A 722 are permitted, provided they conform to the minimum requirements in ASTM A 421, ASTM A 416 or ASTM A 722 and are approved by the architect/engineer.
2. Bars and wires of less than 150 kips per square inch (ksi) (1034 MPa) tensile strength and conforming to ASTM A 82, ASTM A 510, ASTM A 615, ASTM A 996 or ASTM A 706 are permitted to be used as prestressed tendons, provided that:
 - 2.1. The stress relaxation properties have been assessed by tests according to ASTM E 328 for the maximum permissible stress in the tendon.
 - ~~2.2. Other nonstress-related requirements of ACI 530/ASCE 5/TMS 402, Chapter 4, addressing prestressing tendons are met.~~

2. Add standard to Chapter 35 as follows:

ASTM

C 1611/C 1611M-05 Standard Test Method for Slump Flow of Self-Consolidating Concrete

Reason: The revisions proposed in this code change reflect editorial and substantive revisions incorporated into the 2008 edition of the Building Code Requirements for Masonry Structures (TMS 402/ACI 530/ASCE 5), commonly referred to as the Masonry Standard Joint Committee (MSJC) Code. This code change proposal is one of several to harmonize the design and construction requirements for masonry within the IBC with those in the reference standard. A complete list of revisions incorporated into the reference standard is available for download at www.masonrystandards.org.

The majority of these proposed revisions are editorial in nature. Specific substantive revisions proposed above include:

- 1) Replacing Table 2103.8(1). The existing table in the IBC is incorrect due apparently to a transcription error. The proposed Table 2103.8(1) correctly identifies the proportion requirements in accordance with ASTM C 270.
- 2) Self-consolidating grout is proposed to be added with requirements identical to those adopted by TMS 602/ACI 530.1/ASCE 6. Research documenting the performance of self-consolidating grout in masonry construction is available at: <http://www.ncma.org/research/reports/MR31.pdf>
<http://www.ncma.org/research/reports/MR29.pdf>
- 3) The requirement stating "Other nonstress-related requirements of ACI 530/ASCE 5/TMS 402, Chapter 4, addressing prestressing tendons are met." is proposed for deletion as it was from the reference document. The MSJC felt that this statement was too vague to be consistently enforced and was effectively stipulated redundant corrosion protection requirements.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: A review of the standard(s) proposed for inclusion in the code, ASTM C 1611, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before January 15, 2008.

Public Hearing Results

Note: The following analysis was not in the Code Change Proposal book but was posted on the ICC website.

Analysis: Review of proposed new standard ASTM C 1611/C 1611M-05 indicated that, in the opinion of ICC Staff, the standard did comply with ICC standards criteria.

Committee Action:

Approved as Submitted

Committee Reason: In addition to coordinating portions of Section 2103 with the MSJC code, this proposal adds requirements for self-consolidating grout that include reference to the appropriate ASTM standard.

Assembly Action:

None

Final Hearing Results

S177-07/08

AS

Code Change No: **S178-07/08**

Original Proposal

Section: 2103.8, Table 2103.8(1), Table 2103.8(2), Chapter 35

Proponent: Phillip J. Samblanet, The Masonry Society

1. Revise as follows:

2103.8 Mortar. ~~Except for mortars listed in Sections 2103.9, 2103.10, and 2103.11, mortar for use in masonry construction shall conform to ASTM C 270 and Articles 2.1 and 2.6 A of TMS 602/ACI 530.1/ASCE 6. shall conform to the proportion specifications of Table 2103.8(1) or the property specifications of Table 2103.8(2). Type S or N mortar shall be used for glass unit masonry. The amount of water used in mortar for glass unit masonry shall be adjusted to account for the lack of absorption. Retempering of mortar for glass unit masonry shall not be permitted after initial set. Unused mortar shall be discarded within 2 1/2 hours after initial mixing, except that unused mortar for glass unit masonry shall be discarded within 1 1/2 hours after initial mixing.~~

2. Delete without substitution:

~~TABLE 2103.8(1) MORTAR PROPORTIONS~~

~~TABLE 2103.8(2) MORTAR PROPERTIES^a~~

3. Revise Chapter 35 as follows:

ACI

ACI 530-~~05~~ 08 Building Code Requirements for Masonry Structures
ACI 530.1-~~05~~ 08 Specifications for Masonry Structures

ASCE/SEI

ASCE/SEI 5-~~05~~ 08 Building Code Requirements for Masonry Structures
ASCE/SEI 6-~~05~~ 08 Specifications for Masonry Structures

TMS

TMS 402-~~05~~ 08 Building Code Requirements for Masonry Structures
TMS 602-~~05~~ 08 Specification for Masonry Structures

Reason: This change is intended to simplify and clarify the IBC, while correcting errors made in transcription of ASTM requirements into the IBC.

The provisions in this section are no longer consistent with those ASTM C 270 and TMS 602/ACI 530.1/ASCE 6 and are considered incorrect by masonry experts. For example, Tables 2103.8(2) was found to be in error by ICC Structural Masonry Special Inspectors Examination Committee recently, when someone taking the test appealed a question that is consistent with the IBC, but not ASTM C 270 (the issue in question is the amount of sand that is permitted. ASTM C270 allows 3 ½ parts while the IBC limits it to 3 parts). Because of this typographical error, the IBC inadvertently restricts the use of common mortar mixes.

Transcription of requirements is not needed as users already must understand the reference standards. Moreover the transcription causes confusion when inspectors, building officials, designers, and others must try to determine if minor differences occur between the IBC and the referenced standards, and whether these minor differences are intentional or accidental, and whether any differences are important. Because ASTM C 270 and TMS 402/ACI 530.1/ASCE 6 are already required, these transcribed provisions are proposed to be deleted for clarity and brevity, while avoiding confusion between the differences in the provisions.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Errata: Add updates to referenced standards:

ACI

ACI 530.1-~~05~~08 Specifications for Masonry Structures

ASCE/SEI

ASCE/SEI 6-0508 Specifications for Masonry Structures

TMS

TMS 602-0508 Specification for Masonry Structures

Committee Action:

Approved as Modified

Modify proposal as follows:

2103.8 Mortar. ~~Except for mortars listed in Sections 2103.9, 2103.10, and 2103.11, Mortar for use in masonry construction shall conform to ASTM C 270 and Articles 2.1 and 2.6 A of TMS 602/ACI 530.1/ASCE 6, except for mortars listed in Sections 2103.9, 2103.10, and 2103.11.~~

Committee Reason: This proposal resolves conflicts between the IBC table and referenced standards by replacing the IBC requirement with a reference to the MSJC Specification. The modification rearranges the wording of Section 2103.8 that lists mortars not addressed by the MSJC Specification.

Assembly Action:

None

Final Hearing Results

S178-07/08

AM

Code Change No: S180-07/08

Original Proposal

Table 1708.1.2, Table 1708.1.4, 2103.12, Table 2103.12, 2105.2.2.1, Chapter 35

Proponent: Phillip J. Samblanet, The Masonry Society

1. Revise tables as follows:

**TABLE 1708.1.2
LEVEL 1 QUALITY ASSURANCE
MINIMUM TESTS AND SUBMITTALS**

Certificates of compliance used in masonry construction.

Verification of f_m and f_{AAC} prior to construction, except where specifically exempted by this code.

Verification of slump flow and visual stability index of self-consolidating grout as delivered to the site in accordance with Article 1.5.B.1.b.3 of TMS 602/ACI 530.1/ASCE 6.

**TABLE 1708.1.4
LEVEL 2 QUALITY ASSURANCE
MINIMUM TESTS AND SUBMITTALS**

Certificates of compliance used in masonry construction.

Verification of f_m and f_{AAC} prior to construction and every 5,000 square feet during construction.

Verification of proportions of materials in premixed or preblended mortar prestressing grout and grout other than self-consolidating grout as delivered to the site.

Verification of slump flow and visual stability index of self-consolidating grout as delivered to the site in accordance with Article 1.5.B.1.b.3 of TMS 602/ACI 530.1/ASCE 6.

2103.12 Grout. Grout shall conform to ~~Table 2103.12~~ Articles 2.2, 2.6 B and 3.5 of TMS 602/ ACI 530.1/ASCE 6 or to ASTM C 476. ~~When grout conforms to ASTM C 476, the grout shall be specified by proportion requirements or property requirements.~~

2. Delete table without substitution:

TABLE 2103.12
GROUT PROPORTIONS BY VOLUME FOR
MASONRY CONSTRUCTION

3. Revise as follows:

2105.2.2.1.1 Clay masonry. The compressive strength of masonry shall be determined based on the strength of the units and the type of mortar specified using Table 2105.2.2.1.1, provided:

1. Units conform to ASTM C 62, ASTM C 216 or ASTM C 652 and are sampled and tested in accordance with ASTM C 67.
2. Thickness of bed joints does not exceed 5/8 inch (15.9 mm).
3. For grouted masonry, the grout meets one of the following requirements:
 - 3.1. Grout conforms to ASTM C 476 or Article 2.2 of TMS 602/ACI 530.1/ASCE 6.
 - 3.2. Minimum grout compressive strength equals or exceeds f'_m but not less than 2,000 psi (13.79MPa). The compressive strength of grout shall be determined in accordance with ASTM C 1019.

2105.2.2.1.2 Concrete masonry. The compressive strength of masonry shall be determined based on the strength of the unit and type of mortar specified using Table 2105.2.2.1.2, provided:

1. Units conform to ASTM C 55 or ASTM C 90 and are sampled and tested in accordance with ASTM C 140.
2. Thickness of bed joints does not exceed 5/8 inch (15.9 mm).
3. For grouted masonry, the grout meets one of the following requirements:
 - 3.1. Grout conforms to ASTM C 476 or Article 2.2 of TMS 602/ACI 530.1/ASCE 6.
 - 3.2. Minimum grout compressive strength equals or exceeds f'_m but not less than 2,000 psi (13.79 MPa). The compressive strength of grout shall be determined in accordance with ASTM C 1019.

2105.2.2.1.3 AAC masonry. The compressive strength of AAC masonry shall be based on the strength of the AAC masonry unit only and the following shall be met:

1. Units conform to ASTM C 1386.
2. Thickness of bed joints does not exceed 1/8 inch (3.2 mm).
3. For grouted masonry, the grout meets one of the following requirements:
 - 3.1. Grout conforms to ASTM C 476 or Article 2.2 of TMS 602/ACI 530.1/ASCE 6.
 - 3.2. Minimum grout compressive strength equals or exceeds f'_{AAC} but not less than 2,000 psi (13.79 MPa). The compressive strength of grout shall be determined in accordance with ASTM C 1019.

4. Revise Chapter 35 as follows:**ACI**

ACI 530-05 08 Building Code Requirements for Masonry Structures

ACI 530.1-05 08 Specifications for Masonry Structures

ASCE/SEI

ASCE/SEI 5-05 08 Building Code Requirements for Masonry Structures

ASCE/SEI 6-05 08 Specifications for Masonry Structures

TMS

TMS 402-05 08 Building Code Requirements for Masonry Structures

TMS 602-05 08 Specification for Masonry Structures

Reason: Self consolidating grout is increasingly being used for reinforced masonry because of its exceptional flowing properties that allow the grout to flow through confined spaces easily, while maintaining the integrity of the mix. This change incorporates the use of self-consolidating grout when the requirements of TMS 602/ACI 530.1/ASCE 6 are met.

Other minor changes that are being made include:

- The second sentence of this Section 2103.12 is being proposed for deletion because it is not needed. ASTM C 476 only has two procedures to specify grout – by proportion and by property. Thus noting this here, is redundant.
- Table 2103.13 is also being proposed to be deleted because it is redundant with ASTM C 476, and leaving it here confusing inspectors and building officials as to the differences between the tables. This has been an issue for the ICC/TMS Structural Masonry Special Inspectors Examination Committee.

- While the change is focused on self-consolidating grout, the “Minimum Test and Submittal” requirements in Table 1708.1.4 are also being updated to:
 - include verification for proportions of prestressing grout as required by TMS 602/ACI 530.1/ASCE 6
 - clarify the requirements for mortar so that verification in this table is directed at proportions of premixed mortar because Table 1704.5.3 already requires verification of proportions of site mixed mortars.

The end result of this change is to update the IBC to permit the use of self consolidating grout but only when the requirements of TMS 602/ACI 530.1/ASCE 6 are met, while clarifying other portions of the Code related to grout materials and requirements. The resulting provisions simplify the Code for inspectors and building officials so they know what needs to be done for both traditional grout and for the increasingly used self-consolidating grout.

This proposal may in fact decrease the cost of construction by allowing the use of self-consolidating grout.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Errata: Add updates to referenced standards as follows:

ACI
ACI 530.1-~~05~~08 Specifications for Masonry Structures

ASCE/SEI
ASCE/SEI 6-~~05~~08 Specifications for Masonry Structures

TMS
TMS 602-~~05~~08 Specification for Masonry Structures

Committee Action:

Approved as Submitted

Committee Reason: This proposal adds the appropriate QA requirements for self-consolidating grout and is consistent with the action taken on S177-07/08.

Assembly Action:

None

Final Hearing Results

S180-07/08

AS

Code Change No: S181-07/08

Original Proposal

Section: 2103.13.6

Proponent: Philip Brazil, PE, SE, Reid Middleton, Inc., representing himself

Revise as follows:

2103.13.6 Prestressing tendons. Prestressing tendons shall conform to one of the following standards:

- a. Wire ASTM A 421
- b. Low-relaxation wire ASTM A 421
- c. Strand ASTM A 416
- d. Low-relaxation strand ASTM A 416
- e. Bar ASTM A 722

Exceptions:

1. Wire, strands and bars not specifically listed in ASTM A 421, ASTM A 416 or ASTM A 722 are permitted, provided they conform to the minimum requirements in ASTM A 421, ASTM A 416 or ASTM A 722 and are approved by the ~~architect/engineer~~ registered design professional.

2. Bars and wires of less than 150 kips per square inch (ksi) (1034 MPa) tensile strength and conforming to ASTM A 82, ASTM A 510, ASTM A 615, ASTM A 996 or ASTM A 706 are permitted to be used as prestressed tendons, provided that:
 - 2.1. The stress relaxation properties have been assessed by tests according to ASTM E 328 for the maximum permissible stress in the tendon.
 - 2.2. Other nonstress-related requirements of ACI 530/ASCE 5/TMS 402, Chapter 4, addressing prestressing tendons are met.

Reason: The change is proposed for consistency with the use of “registered design professional” elsewhere in the 2006 IBC (approximately 50 code sections). Section 2103.13.6 is the only instance of “architect/engineer” in the 2006 IBC.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: This change to “registered design professional” is an appropriate correction to the code terminology.

Assembly Action:

None

Final Hearing Results

S181-07/08

AS

Code Change No: **S183-07/08**

Original Proposal

Section: 2104.1.2.7

Proponent: Jason Thompson, National Concrete Masonry Association, representing Masonry Alliance for Codes and Standards

Revise as follows:

2104.1.2.7 Grouted masonry. ~~Between grout pours, a horizontal construction joint shall be formed by stopping all wythes at the same elevation and with the grout stopping a minimum of 1 1/2 inches (38 mm) below a mortar joint, except at the top of the wall. Where bond beams occur, the grout pour shall be stopped a minimum of 1/2 inch (12.7 mm) below the top of the masonry. When grouting, form grout keys between grout pours in accordance with the following:~~

1. Form a grout key by terminating the grout a minimum of 1 1/2 in. (38.1 mm) below a mortar joint at vertically grouted spaces.
2. Form a grout key between grout lifts when the first lift is permitted to set prior to placement of the subsequent lift.
3. At beams, terminate the grout pour in the course above or the course below the beam and form a grout key. Completely fill the beam except form a grout key at vertically reinforced cells.

Reason: The revisions proposed in this code change reflect editorial and substantive revisions incorporated into the 2008 edition of the Building Code Requirements for Masonry Structures (TMS 402/ACI 530/ASCE 5), commonly referred to as the Masonry Standard Joint Committee (MSJC) Code. This code change proposal is one of several to harmonize the design and construction requirements for masonry within the IBC with those in the reference standard. A complete list of revisions incorporated into the reference standard is available for download at www.masonrystandards.org.

Specific substantive revisions proposed above include:

Section 2104.1.2.7 is revised to reflect changes incorporated into the reference standard. The requirements are largely the same, but the proposed revision does not require a grout key to be formed when subsequent lifts are placed prior to the previous lifts setting. The resulting language is believed to be clearer and less problematic to enforce and interpret in the field.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: These revised grouted masonry requirements provide consistency with the latest edition of the MSJC code and this approval is consistent with other actions concerning updates to the masonry provisions.

Assembly Action:

None

Final Hearing Results

S183-07/08

AS

Code Change No: **S185-07/08**

Original Proposal

Sections: 2105.2.2.1.1, Table 2105.2.2.1.1, 2105.2.2.1.2, 2105.2.2.1.3

Proponent: Jason Thompson, National Concrete Masonry Association, representing Masonry Alliance for Codes and Standards

Revise as follows:

2105.2.2.1.1 Clay masonry. The compressive strength of masonry shall be determined based on the strength of the units and the type of mortar specified using Table 2105.2.2.1.1, provided:

1. Units ~~conform to~~ are sampled and tested to verify conformance with ASTM C 62, ASTM C 216 or ASTM C 652 ~~and are sampled and tested in accordance with ASTM C 67.~~
2. Thickness of bed joints does not exceed 5/8 inch (15.9 mm).
3. For grouted masonry, the grout meets one of the following requirements:
 - 3.1. Grout conforms to ~~ASTM C 476~~ Article 2.2 of TMS 602/ACI 530.1/ASCE 6.
 - 3.2. Minimum grout compressive strength equals or exceeds *f_m* but not less than 2,000 psi (13.79MPa). The compressive strength of grout shall be determined in accordance with ASTM C 1019.

**TABLE 2105.2.2.1.1
COMPRESSIVE STRENGTH OF CLAY MASONRY**

NET AREA COMPRESSIVE STRENGTH OF CLAY MASONRY UNITS (psi)		NET AREA COMPRESSIVE STRENGTH OF MASONRY (psi)
Type M or S mortar	Type N mortar	
1,700	2,100	1,000
3,350	4,150	1,500
4,950	6,200	2,000
6,600	8,250	2,500
8,250	10,300	3,000
9,900	—	3,500
13,200-11,500	—	4,000

For SI: 1 pound per square inch = 0.00689MPa.

2105.2.2.1.2 Concrete masonry. The compressive strength of masonry shall be determined based on the strength of the unit and type of mortar specified using Table 2105.2.2.1.2, provided:

1. Units ~~conform to~~ are sampled and tested to verify conformance with ASTM C 55 or ASTM C 90 ~~and are sampled and tested in accordance with ASTM C 140.~~

2. Thickness of bed joints does not exceed 5/8 inch (15.9 mm).
3. For grouted masonry, the grout meets one of the following requirements:
 - 3.1. Grout conforms to ~~ASTM C 476~~ Article 2.2 of TMS 602/ACI 530.1/ASCE 6.
 - 3.2. Minimum grout compressive strength equals or exceeds f_m but not less than 2,000 psi (13.79 MPa). The compressive strength of grout shall be determined in accordance with ASTM C 1019.

2105.2.2.1.3 AAC masonry. The compressive strength of AAC masonry shall be based on the strength of the AAC masonry unit only and the following shall be met:

1. Units conform to ASTM C 1386.
2. Thickness of bed joints does not exceed 1/8 inch (3.2 mm).
3. For grouted masonry, the grout meets one of the following requirements:
 - 3.1. Grout conforms to ~~ASTM C 476~~ Article 2.2 of TMS 602/ACI 530.1/ASCE 6.
 - 3.2. Minimum grout compressive strength equals or exceeds f_{AAC} but not less than 2,000 psi (13.79 MPa). The compressive strength of grout shall be determined in accordance with ASTM C 1019.

Reason: The revisions proposed in this code change reflect editorial and substantive revisions incorporated into the 2008 edition of the Building Code Requirements for Masonry Structures (TMS 402/ACI 530/ASCE 5), commonly referred to as the Masonry Standard Joint Committee (MSJC) Code. This code change proposal is one of several to harmonize the design and construction requirements for masonry within the IBC with those in the reference standard. A complete list of revisions incorporated into the reference standard is available for download at www.masonrystandards.org.

The majority of these proposed revisions are editorial in nature. Specific substantive revisions proposed above include:

- 1) The minimum unit compressive strength for clay masonry construction in Table 2105.2.2.1.1 is changed from 13,200 psi to 11,500 psi. The value of 13,200 psi was found to be an error in the unit strength method of verifying the masonry compressive strength. As detailed in the MSJC commentary, the equation derived for the unit strength correlation table is:

$$f_u = \frac{f'_m / 1.22 - 400}{B}$$

Where $B = 0.2$ for Type N mortar and $B = 0.25$ for Type S or M mortar. For an f'_m value of 4,000 psi, the unit strength using a Type M or S mortar is indeed 11,500 psi.

- 2) Changing the reference from ASTM C 476 to Article 2.2 of the MSJC standard will help to ensure that subsequent restrictions on the use of the unit strength method in grouted masonry construction that are imposed by the referenced standard are in inadvertently overlooked.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: This code change provides clearer, more concise wording of the masonry QA requirements as well as consistency with the latest the MSJC specification.

Assembly Action:

None

Final Hearing Results

S185-07/08

AS

Code Change No: S193-07/08

Original Proposal

Sections: 2111.3, 2111.4, 2113.3, 2113.4

Proponent: Jim W. Sealy, FAIA, and Perry A. Haviland, FAIA, Building Seismic Safety Council of the National Institute of Building Sciences, representing FEMA/BSSC Code Resource Support Committee

Revise as follows:

2111.3 Seismic reinforcing. Masonry or concrete fireplaces shall be constructed, anchored, supported and reinforced as required in this chapter. In Seismic Design Category C or D, masonry and concrete fireplaces shall be reinforced and anchored as detailed in Sections 2111.3.1, 2111.3.2, 2111.4 and 2111.4.1 for chimneys serving fireplaces. In Seismic Design Category A, or B or C, reinforcement and seismic anchorage is not required. In Seismic Design Category E or F, masonry and concrete chimneys shall be reinforced in accordance with the requirements of Sections 2101 through 2108.

2111.4 Seismic anchorage. Masonry and concrete chimneys in Seismic Design Category C or D shall be anchored at each floor, ceiling or roof line more than 6 feet (1829 mm) above grade, except where constructed completely within the exterior walls. Anchorage shall conform to the following requirements.

2113.3 Seismic reinforcing. Masonry or concrete chimneys shall be constructed, anchored, supported and reinforced as required in this chapter. In Seismic Design Category C or D, masonry and concrete chimneys shall be reinforced and anchored as detailed in Sections 2113.3.1, 2113.3.2 and 2113.4. In Seismic Design Category A, or B or C, reinforcement and seismic anchorage is not required. In Seismic Design Category E or F, masonry and concrete chimneys shall be reinforced in accordance with the requirements of Sections 2101 through 2108.

2113.4 Seismic anchorage. Masonry and concrete chimneys and foundations in Seismic Design Category C or D shall be anchored at each floor, ceiling or roof line more than 6 feet (1829 mm) above grade, except where constructed completely within the exterior walls. Anchorage shall conform to the following requirements.

Reason: The purpose of this change is to extend the IBC provisions for reinforcing and anchorage of masonry and concrete fireplaces and chimneys to Seismic Design Category C. Many unreinforced masonry chimneys have been damaged during moderate earthquakes that have occurred in Seismic Design Category C locations such as the Nisqually Washington Earthquake (2001), Borah Peak Idaho Earthquake (1983) and the Coalinga California Earthquake (1983), damaged many unreinforced chimneys. In the case of the Borah Peak earthquake, a loss of life occurred due to the collapse of a masonry chimney at a dwelling ("The Boarah Peak, Idaho, Earthquake of October 18, 1983," *Earthquake Spectra* 2, No. 1, November 1985: 1-248).

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: Masonry chimneys are the most vulnerable part of a residence in an earthquake. Extending the current requirements to include Seismic Design Category C is a prudent measure.

Assembly Action:

None

Final Hearing Results

S193-07/08

AS

Code Change No: **S194-07/08**

Original Proposal

Sections: 2111.8; IRC R1001.8

Proponent: Jim Buckley, Buckley Rumford Co., representing Masonry Alliance for Codes and Standards (MACS) & Clay Flue Lining Institute (CFLI)

THESE PROPOSALS ARE ON THE AGENDA OF THE IBC STRUCTURAL AND THE IRC BUILDING/ENERGY CODE DEVELOPMENT COMMITTEES AS 2 SEPARATE CODE CHANGES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IBC STRUCTURAL

Revise as follows:

2111.8 Smoke chamber walls. Smoke chamber walls shall be constructed of solid masonry units, hollow masonry units grouted solid, stone or concrete. The total minimum thickness of front, back and side walls shall be 8 inches (203 mm) of solid masonry. The inside surface shall be parged smooth with refractory mortar conforming to ASTM C 199. ~~Corbelling of masonry units shall not leave unit cores exposed to the inside of the smoke chamber. The inside surface of corbeled masonry shall be parged smooth. Where no lining is provided, the total minimum thickness of front, back and sidewalls shall be 8 inches (203 mm) of solid masonry.~~ When a lining of firebrick at least 2 inches (51 mm) thick, or a lining of vitrified clay at least 5/8 inch (15.9 mm) thick, is provided, the total minimum thickness of front, back and sidewalls shall be 6 inches (152 mm) of solid masonry, including the lining. Firebrick shall conform to ASTM ~~C 27~~ or ASTM C 1261 and shall be laid with refractory mortar conforming to ASTM C 199. Vitrified clay linings shall conform to ASTM C 315.

PART II – IRC BUILDING/ENERGY

Revise as follows:

R1001.8 Smoke chamber. Smoke chamber walls shall be constructed of solid masonry units, hollow masonry units grouted solid, stone or concrete. The total minimum thickness of front, back and side walls shall be 8 inches (203 mm) of solid masonry. The inside surface shall be parged smooth with refractory mortar conforming to ASTM C 199. ~~Corbelling of masonry units shall not leave unit cores exposed to the inside of the smoke chamber.~~ When a lining of firebrick at least 2 inches (51 mm) thick, or a lining of vitrified clay at least 5/8 inch (16 mm) thick, is provided, the total minimum thickness of front, back and side walls shall be 6 inches (152 mm) of solid masonry, including the lining. Firebrick shall conform to ASTM ~~C 27~~ or C 1261 and shall be laid with medium duty refractory mortar conforming to ASTM C 199. Vitrified clay linings shall conform to ASTM C 315. ~~Where no lining is provided, the total minimum thickness of front, back and side walls shall be 8 inches (203 mm) of solid masonry. When the inside surface of the smoke chamber is formed by corbeled masonry, the inside surface shall be parged smooth.~~

Reason: To require at least some liner able to withstand 1800 degrees F as required of all the other fireplace and chimney lining materials. Cores in corbelled masonry will be covered if the smoke chamber is required to be parged with refractory mortar anyway. Also to reference appropriate ASTM standards.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing Results

PART I – IBC STRUCTURAL

Committee Action:

Approved as Submitted

Committee Reason: This proposal promotes better integrity for masonry fireplaces, by specifying minimum requirements for the fireplace smoke chamber.

Assembly Action:

None

**PART II – IRC B/E
Committee Action:**

Approved as Submitted

Committee Reason: This change adds parging to the smoke chamber. Also provides cover for cores in corbelled units.

Assembly Action:

None

Final Hearing Results

**S194-07/08, Part I AS
S194-07/08, Part II AS**

Code Change No: S198-07/08

Original Proposal

Sections: 2113.11.1; IRC R1003.11.1

Proponent: Jim Buckley, Buckley Rumford Co., representing Masonry Alliance for Codes and Standards (MACS) & Clay Flue Lining Institute (CFLI)

THESE PROPOSALS ARE ON THE AGENDA OF THE IBC STRUCTURAL AND THE IRC BUILDING/ENERGY CODE DEVELOPMENT COMMITTEES AS 2 SEPARATE CODE CHANGES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IBC STRUCTURAL

Revise as follows:

2113.11.1 Residential-type appliances (general). Flue lining systems shall comply with one of the following:

1. Clay flue lining complying with the requirements of ASTM C 315, ~~or equivalent.~~
2. Listed chimney lining systems complying with UL 1777.
3. Factory-built chimneys or chimney units listed for installation within masonry chimneys.
4. Other approved materials that will resist corrosion, erosion, softening or cracking from flue gases and condensate at temperatures up to 1,800°F (982°C).

PART II – IRC BUILDING/ENERGY

Revise as follows:

R1003.11.1 Residential-type appliances (general). Flue lining systems shall comply with one of the following:

1. Clay flue lining complying with the requirements of ASTM C 315 ~~or equivalent.~~
2. Listed chimney lining systems complying with UL 1777.
3. Factory-built chimneys or chimney units listed for installation within masonry chimneys.
4. Other approved materials that will resist corrosion, erosion, softening or cracking from flue gases and condensate at temperatures up to 1,800°F (982°C)

Reason: What's "equivalent"? Just meet the standard.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

**PART I – IBC STRUCTURAL
Committee Action:**

Approved as Submitted

Committee Reason: This code change removes unnecessary wording. Equivalency is already allowed by Section 104.11 of the code.

Assembly Action:

None

**PART II – IRC B/E
Committee Action:****Approved as Submitted****Committee Reason:** This change deletes the redundant term "or equivalent". Section R104.11 of the code already permits alternate materials.**Assembly Action:****None****Final Hearing Results**

S198-07/08, Part I	AS
S198-07/08, Part II	AS

Code Change No: S201-07/08**Original Proposal****Section: 2203****Proponent:** Bonnie Manley, American Iron and Steel Institute, representing American Institute of Steel Construction**1. Revise as follows:**

2203.1 Identification. Identification of structural steel members shall comply with the requirements contained in AISC 360. Other steel furnished for structural load-carrying purposes shall be properly identified for conformity to the ordered grade in accordance with the specified ASTM standard or other specification and the provisions of this chapter. Steel that is not readily identifiable as to grade from marking and test records shall be tested to determine conformity to such standards.

2203.2 Protection. Painting of structural steel members shall comply with the requirements contained in AISC 360. Individual structural members and assembled panels of cold-formed steel construction, except where fabricated of approved corrosion-resistant steel or of steel having a corrosion-resistant or other approved coating, shall be protected against corrosion with an approved coat of paint, enamel or other approved protection.

Reason: *Section 2203.1:* This modification, similar to the first sentence of Section 2203.2, clarifies that the identification of structural steel members should be in accordance with the requirements of AISC 360, *Specification for Structural Steel Buildings*. In particular, AISC 360, Section M5.5 addresses the identification of steel.

Section 2203.2: This modification clarifies that it is the defined term, "structural steel members," that is to be in accordance with AISC 360. The term is defined in Section 2202.1 and includes rolled steel structural shapes other than cold-formed steel or steel joist members. The remainder of the paragraph is unchanged.

Cost Impact: The code change proposal will not increase the cost of construction.**Public Hearing Results****Committee Action:****Approved as Submitted****Committee Reason:** This change adopts the material-specific approach of the recognized material standard for identifying structural steel members.**Assembly Action:****None****Final Hearing Results**

S201-07/08	AS
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Code Change No: S202-07/08

Original Proposal

Section: 2203

Proponent: Bonnie Manley, American Iron and Steel Institute, representing American Iron and Steel Institute

Revise as follows:

2203.1 Identification. Identification of cold-formed steel members shall comply with the requirements contained in AISI S100. Identification of cold-formed steel light frame construction shall also comply with the requirements contained in AISI S200. Other steel furnished for structural load-carrying purposes shall be properly identified for conformity to the ordered grade in accordance with the specified ASTM standard or other specification and the provisions of this chapter. Steel that is not readily identifiable as to grade from marking and test records shall be tested to determine conformity to such standards.

2203.2 Protection. Painting of structural steel shall comply with the requirements contained in AISC 360. Individual structural members and assembled panels of cold-formed steel construction, except where fabricated of approved corrosion-resistant steel or of steel having a corrosion-resistant or other approved coating, shall be protected against corrosion with an approved coat of paint, enamel or other approved protection in accordance with the requirements contained in AISI S100. Protection of cold-formed steel light frame construction shall also comply with the requirements contained in AISI S200.

Reason: *Section 2203.1:* This modification clarifies that the identification of cold-formed steel members should be in accordance with the requirements of AISI S100. In particular, AISI S100, Section A addresses the identification of cold-formed steel. This change also clarifies that cold-formed steel light frame construction should be identified in accordance with the additional requirements of AISI S200, Section A5.

Section 2203.2: This modification clarifies that the protection of cold-formed steel members should be in accordance with the general requirements of AISI S100. In particular, AISI S100, Section A addresses the protection of cold-formed steel from corrosion. This change also clarifies that cold-formed steel light frame construction should be protected in accordance with the additional requirements of AISI S200, Section A4

The primary reason for making these recommendations is to clarify right upfront in Chapter 22 that there are accepted consensus standards that govern the identification and protection of cold formed steel and cold-formed steel light frame construction.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Errata: Correct Section 2203.2 to read as follows:

2203.2 Protection. Painting of structural steel shall comply with the requirements contained in AISC 360. Individual structural members and assembled panels of cold-formed steel construction, except where fabricated of approved corrosion-resistant steel or of steel having a corrosion-resistant or other approved coating, shall be protected against corrosion with an approved coat of paint, enamel or other approved protection in accordance with the requirements contained in AISI S100. Protection of cold-formed steel light frame construction shall also comply with the requirements contained in AISI S200.

Committee Action:

Approved as Submitted

Committee Reason: This code change clarifies the identification and protection of cold-formed steel members by adding references to the applicable material standard.

Assembly Action:

None

Final Hearing Results

S202-07/08

AS

Code Change No: **S204-07/08**

Original Proposal

Sections: 1604.3.3, 2203.2, 2206.1, 2206.5, Chapter 35 (New)

Proponent: Bonnie Manley, American Iron and Steel Institute, representing Steel Joist Institute

1. Revise as follows:

1604.3.3 Steel. The deflection of steel structural members shall not exceed that permitted by AISC 360, AISI-NAS, AISI-General, AISI-Truss, ASCE 3, ASCE 8, SJI CJ-1.0, SJI JG-1.1, SJI K-1.1 or SJI LH/DLH-1.1, as applicable.

2203.2 Protection. Painting of structural steel shall comply with the requirements contained in AISC 360. Painting of open-web steel joists and joist girders shall comply with the requirements of SJI CJ-1.0, SJI JG-1.1, SJI K-1.1, and SJI LH/DLH-1.1. Individual structural members and assembled panels of cold-formed steel construction, except where fabricated of approved corrosion-resistant steel or of steel having a corrosion-resistant or other approved coating, shall be protected against corrosion with an approved coat of paint, enamel or other approved protection.

2206.1 General. The design, manufacture and use of open web steel joists and joist girders shall be in accordance with one of the following Steel Joist Institute (SJI) specifications:

1. SJI CJ-1.0
- ~~2~~4. SJI K-1.1
- ~~3~~2. SJI LH/DLH-1.1
- ~~4~~3. SJI JG-1.1

Where required, the seismic design of buildings shall be in accordance with the additional provisions of Section 2205.2 or 2210.5.

2206.5 Certification. At completion of manufacture fabrication, the steel joist manufacturer shall submit a certificate of compliance in accordance with Section 1704.2.2 stating that work was performed in accordance with approved construction documents and with SJI standard specifications.

2. Add standard to Chapter 35 as follows:

Steel Joist Institute

CJ-1.0 —06 Standard Specification for Composite Steel Joists, CJ-Series

Reason: Published in May 2006 as an ANSI standard, this new specification covers the load and resistance factor design (LRFD), manufacture, and use of simply-supported open web composite steel joists, CJ-Series. Specifically, this standard includes the following requirements on the limits of deflection for composite steel joists:

SJI CJ-1.0:

104.10 DEFLECTION

The deflection due to the design live load shall not exceed the following:

Floors: 1/360 of span.

Roofs: 1/360 of span where a plaster ceiling is attached or suspended.
1/240 of span for all other cases.

The specifying professional shall give due consideration to the effects of deflection, both short and long term, and vibration in the selection of composite joists. All deflection calculations should account for the inherent flexibility of the open web configuration.

This code change adds a new reference document to IBC Section 2206.1. Published in May 2006 as an ANSI standard, this new SJI specification covers the load and resistance factor design (LRFD), manufacture, and use of simply-supported open web composite steel joists, CJ-Series.

The modification in IBC Section 2206.5 corrects the terminology. SJI prefers not to use the word "fabrication" in regard to joist products. They are a manufactured product.

Currently, Section 2203.2 does not address the "protection" of joists and joist girders. Since the SJI specifications cover this topic for each type of joist and joist girder, references to the SJI specifications have been added to this section to aid the user.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Note: The following analysis was not in the Code Change Proposal book but was posted on the ICC website.

Analysis: Review of proposed new standard SJI CJ-1.0-06 indicated that, in the opinion of ICC Staff, the standard did comply with ICC standards criteria.

Committee Action: **Approved as Submitted**

Committee Reason: It is appropriate to reference the new standard for composite steel joists. This proposal also clarifies the protection requirements for open web steel joist and joist girders by referring directly to the applicable material standards.

Assembly Action: **None**

Final Hearing Results

S204-07/08

AS

Code Change No: S205-07/08

Original Proposal

Section: 2208.1, Chapter 35

Proponent: Victor D. Azzi, PhD, PE, Consulting Structural Engineer, representing Rack Manufacturers Institute

Revise as follows:

2208.1 Storage racks. The design, testing and utilization of industrial steel storage racks shall be in accordance with the *RMI/ANSI MH 16.1 Specification for the Design, Testing and Utilization of Industrial Steel Storage Racks*. Racks in the scope of this specification include industrial pallet racks, movable shelf racks and stacker racks made of cold-formed or hot-rolled steel structural members. Such rack types also include push-back rack, pallet-flow rack, case-flow rack pick modules, rack supported platforms, and the storage rack portion of any rack structure that acts as support for the exterior walls and roof, except as noted; and ~~does not apply to~~ other types of racks, such as drive-in and drive-through racks, cantilever racks, or portable racks or rack buildings. Where required, the seismic design of storage racks shall be in accordance with the provisions of Section 15.5.3 of ASCE 7.

Revise Chapter 35 as follows:

Rack Manufacturing Institute

RMI/ANSI MH 16.1-07(2000) Specification for Industrial Steel Storage Racks

Reason: *RMI/ANSI MH 16.1-2007, Specification for the Design, Testing, and Utilization of Industrial Steel Storage Racks*, is designed to be a stand-alone Standard to be adopted by reference. For a number of years and several provision- and code-change cycles, the Rack Manufacturers Institute has worked to harmonize its Specification with the model codes and with the code-resource and seismic-provision documents. Working with the Non-Building Structures committees of the FEMA/BSSC TS-8 and ASCE 7, and the Task Group on *FEMA/BSSC 460(2005), Seismic Considerations for Steel Storage Racks Located in Areas Open to the Public*, the seismic provisions have been developed and stated to be self-sufficient, incorporating the results of the work of those efforts. For those who abide by *RMI/ANSI MH 16.1-2007*, there is no longer a need for the qualifying remarks and amendments as expressed in Section 15.4 and Section 15.5.1 of Section 15.5.3 of ASCE 7.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action: **Approved as Modified**

Modify proposal as follows:

2208.1 Storage racks. The design, testing and utilization of industrial steel storage racks, made of cold-formed or hot-rolled steel structural members, shall be in accordance with the *RMI/ANSI MH 16.1*. ~~Racks in the scope of this specification include industrial pallet racks, movable shelf racks and stacker racks made of cold-formed or hot-rolled steel structural members. Such rack types also include push-back rack, pallet-flow~~

rack, case flow rack pick modules, rack supported platforms, and the storage rack portion of any rack structure that acts as support for the exterior walls and roof, except as noted; and not other types of racks, such as drive-in and drive-through racks, cantilever racks, or portable racks. Where required by ASCE 7, the seismic design of storage racks shall be in accordance with the provisions of Section 15.5.3 of ASCE 7, except that items (1), (2), and (3) of Section 15.5.3 of ASCE 7 do not apply when the rack design satisfies RMI/ANSI MH 16.1.

Rack Manufacturing Institute

RMI/ANSI MH 16.1-07 08 Specification for the Design, Testing and Utilization of Industrial Steel Storage Racks

Committee Reason: The proposal to refer to the latest version of the standard provides clarifications that address many problems in the design of racks. The modification removes redundant language regarding the scope of the standard. In addition it corrects the date of the standard to 2008 and clarifies the applicability of ASCE 7 Section 15.5.3.

Assembly Action:

None

Final Hearing Results

S205-07/08

AM

Code Change No: **S206-07/08**

Original Proposal

Section: 2209.1

Proponent: Bonnie Manley, American Iron and Steel Institute, representing American Iron and Steel Institute

Revise as follows:

2209.1 General. The design of cold-formed carbon and low-alloy steel structural members shall be in accordance with ~~AISI-NAS AISI S100~~. The design of cold-formed stainless-steel structural members shall be in accordance with ASCE 8. Cold-formed steel light-framed construction shall also comply with Section 2210.

Reason: This code change proposal updates the reference to AISI's *North American Specification for the Design of Cold-Formed Steel Structural Members*, 2007 edition, which has been given the new number designation of AISI S100. This edition of AISI S100, as its name implies, is intended for use throughout Canada, Mexico, and the United States, and supersedes the 2001 edition with the 2004 supplement. AISI S100-07 was developed by a joint effort of the American Iron and Steel Institute's Committee on Specifications, the Canadian Standards Association's Technical Committee on Cold Formed Steel Structural Members (S136), and Camara Nacional de la Industria del Hierro y del Acero (CANACERO) in Mexico.

Since AISI S100-07 is intended for use in Canada, Mexico, and the United States, it uses a format that allows for requirements particular to each country. This results in a main document – Chapters A through G and Appendix 1 and 2 – that is intended for use in all three countries, and two country-specific appendices (A and B). Appendix A is required for use in both the United States and Mexico, and Appendix B is required for use in Canada.

Reflecting its North American scope, AISI S100-07 provides an integrated treatment of Allowable Strength Design (ASD), Load and Resistance Factor Design (LRFD), and Limit States Design (LSD). This is accomplished by including the appropriate resistance factors (ϕ) for use with LRFD and LSD and the appropriate factors of safety (Ω) for use with ASD. It should be noted that the use of LSD is limited to Canada and the use of LRFD and ASD is limited to the United States and Mexico.

AISI S100-07 provides well-defined procedures for the design of load-carrying cold-formed steel members in buildings, as well as other applications, provided that proper allowances are made for dynamic effects. The provisions reflect the results of continuing research to develop new and improved information on the structural behavior of cold-formed steel members. The major changes made in this edition of AISI S100, compared to the previous edition, are summarized as follows:

Reorganization

- The design provisions are reorganized according to their applicability to wall studs and wall stud assemblies (Section D4), floor, roof, or wall steel diaphragm construction (Section D5), and metal roof and wall systems (Section D6). Accordingly, provisions under Chapters C and D of previous editions are relocated.

Definitions

- Country specific terms are indicated in Section A1.3, "Definitions"
- This edition of AISI S100 utilizes terminology jointly defined by AISC and AISI.

Materials

- Provisions for applications of other steels (Section A2.2) have been rewritten.

Strength

- Strength reduction provisions (Section A2.3.2) are introduced for high-strength and low-ductility closed-box section members.

Elements

- The effective width equation (Eq. B2.2-2) for uniformly compressed stiffened elements with circular holes has been revised.

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- New provisions for unstiffened elements and edge stiffeners with stress gradient (Section B3.2) are introduced.
- The provisions for determining the effective width of uniformly compressed elements with one intermediate stiffener (previously in Section B4.1) have been replaced by the provisions of B5.1.

Members

- Provisions for distortional buckling for beams (Section C3.1.4) and columns (C4.2) are introduced.
- The design provisions for bearing stiffeners (previously termed “transverse stiffeners”) have been revised.
- Provisions for the web crippling strength for C- or Z-members with an overhang are added in Section C3.4.1.
- The equations for members subjected to combined bending and web crippling have been recalibrated.
- Provisions for considering combined bending and torsional loading (Section C3.6) are added.

Member Bracing

- Explicit equations for determining the required bracing force for members having neither flange connected to sheathing are provided.
- Provisions for determining the required bracing force and stiffness of a compression member are introduced.

Wall Stud and Wall Stud Assemblies

- The sheathing braced design provisions have been removed.
- New framing standards are referenced.

Floor, Roof, or Wall Steel Diaphragm Construction

- The safety factors and the resistance factors for diaphragms (Section D5) have been revised.

Metal Roof and Wall System

- New provisions for Z-section compression members having one flange fastened to a standing seam roof (Section D6.1.4) are added for the United States and Mexico.
- For standing seam roof panel systems, a load reduction is permitted in the United States and Mexico for load combinations that include wind uplift.
- The provisions for determining the anchorage forces and required stiffness for a purlin roof system under gravity load with the top flange connected to metal sheathing have been revised.

Connections

- Provisions for shear strength determination of welded sheet-to-sheet connections are added.
- An interaction check for screws subjected to combined shear and pull-over is added.
- The design provisions for block shear rupture (Section E5.3) have been revised.

Appendix B

- The section for delivered minimum thickness for Canada is deleted.
- The specified loads (Section A3.1) and the load factors and load combinations for LSD (Section A6.1.2) for Canada have been revised.

New Appendices

- Appendix 1, Direct Strength Design for Cold-Formed Steel Structural Members, is added. The Direct Strength Method provides alternative design provisions for several sections of Chapters C and D.
- Appendix 2, Second Order Analysis, is added. Appendix 2 provides alternative method for considering the second order effect in members subjected to compression and bending.

This code change also makes an editorial change from “light-framed” to “light-frame”, which is preferred by the industry. This editorial change should be made throughout the IBC. The addition of “also” is intended to clarify that AISI S100 is to be used in conjunction with the AISI standards adopted in IBC Section 2210.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: This change is consistent with the standard update approved in S238-07/08. The change in referring to AISI S100 is editorial correction to reflect the new designation of the AISI standard.

Assembly Action:

None

Final Hearing Results

S206-07/08

AS

Code Change No: **S207-07/08**

Original Proposal

Section: 2209.2, Chapter 35 (New)

Proponent: Bonnie Manley, American Iron and Steel Institute, representing Steel Deck Institute

1. Revise as follows:

2209.2 Steel decks. The design and construction of cold-formed steel decks shall be in accordance with this section.

2209.2.1 Composite slabs on steel decks. Composite slabs of concrete and steel deck shall be permitted to be designed and constructed in accordance with ASCE 3 or ANSI/SDI-C1.0.

2209.2.2 Non-composite steel floor decks. Non-composite steel floor decks shall be permitted to be constructed in accordance with ANSI/SDI-NC1.0.

2209.2.3 Steel roof deck. Steel roof decks shall be permitted to be designed and constructed in accordance with ANSI/SDI-RD1.0.

2. Add standards to Chapter 35 as follows:

Steel Deck Institute

<u>C1.0-06</u>	<u>Standard for Composite Steel Floor Deck</u>
<u>NC1.0-06</u>	<u>Standard for Non-Composite Steel Floor Deck</u>
<u>RD1.0-06</u>	<u>Standard for Steel Roof Deck</u>

Reason: This code change proposal introduces three new SDI standards on cold-formed steel decks. It is intended that users be permitted to use these documents in lieu of the more formal approach of AISI S100, *North American Specification for the Design of Cold-Formed Steel Structural Members*. The scope of the documents is as follows:

ANSI/SDI C1.0: "This Specification for Composite Steel Deck shall govern the materials, design, and erection of cold formed steel deck which acts as a permanent form and as positive reinforcement for a structural concrete slab."

ANSI/SDI NC1.0: "This Specification for Non-Composite Steel Floor Deck shall govern the materials, design, and erection of cold formed non-composite steel deck used as a form for reinforced concrete slabs."

ANSI/SDI RD1.0: "This Specification for Steel Roof Deck shall govern the materials, design, and erection of cold formed steel deck used for the support of roofing materials, design live loads and SDI construction loads."

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Analysis: Review of proposed new standards SDI C1.0-06, NC1.0-06 and RD1.0-06 indicated that, in the opinion of ICC Staff, the standards did comply with ICC standards criteria.

Committee Action:

Disapproved

Committee Reason: There are some technical issues with the steel deck standards, regarding the use of fibers to substitute for steel reinforcement required by ACI 318 that should be resolved. This was evidenced by testimony on proposed modifications to both the composite steel floor deck and non-composite floor deck standards.

Assembly Action:

None

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because public comments were submitted.

Public Comment 17:

Thomas Sputo, PhD., PE, SE, Steel Deck Institute, requests Approval as Modified by this Public Comment.

Replace proposal as follows:

2209.2.2 Non-composite steel floor decks. Non-composite steel floor decks shall be permitted to be designed and constructed in accordance with ANSI/SDI-NC1.0, as modified in Section 2209.2.1.1.

2209.2.2.1 ANSI/SDI-NC1.0 Section 2.4B1. Replace Section 2.4B1 of ANSI/SDI-NC1.0 with the following:

1. General: The design of the concrete slabs shall be done in accordance with the ACI *Building Code Requirements for Reinforced Concrete*. The minimum concrete thickness above the top of the deck shall be 1 ½ inches (38 mm).

Steel Deck Institute

NC1.0-06 Standard for Non-Composite Steel Floor Deck

Commenter's Reason: This proposed modification to SDI NC1.0 is intended to remove any doubt that non-composite concrete slabs must be designed in accordance with the applicable reference standard -- ACI 318. By specifically requiring compliance with ACI 318 (which does not permit fibers or fibrous admixtures), and removing any mention of fibers or fibrous admixtures in SDI NC1.0, Section 2.4B1, the IBC Structural Committee's reason for Disapproval has been addressed.

Section 2.4B1 – Text as it appears in SD1-NC1.0:

1. **General:** The design of the concrete slabs shall be done in accordance with the ACI *Building Code Requirements for Reinforced Concrete*. The minimum concrete thickness above the top of the deck shall be 1-1/2 inches (38 mm). Randomly distributed fibers or fibrous admixtures shall not be substituted for welded wire fabric tensile reinforcement.

Public Comment 18:

Thomas Sputo, PhD., PE, SE, Steel Deck Institute, requests Approval as Modified by this Public Comment.

Replace proposal as follows:

2209.2.3 Steel roof deck. Steel roof decks shall be permitted to be designed and constructed in accordance with ANSI/SDI-RD1.0.

Steel Deck Institute

RD1.0-06 Standard for Steel Roof Deck

Commenter's Reason: Based on testimony from the floor, the IRC Building/Energy Committee disapproved the original proposal, citing confusion regarding the use of fibers as a substitute for steel reinforcement in both the composite steel floor deck and non-composite floor deck standards. However, the testimony from the floor regarding the substitution of fibers for steel reinforcement did not apply to the third SDI standard proposed for inclusion in Section 2209.2 – SDI-RD1.0, Standard for Steel Roof Deck. This comment simply recommends this document for adoption in the IBC.

Final Hearing Results

S207-07/08

AMPC17, 18

Code Change No: S208-07/08

Original Proposal

Sections: 2210, 2210.5 (New), 2210.6, Chapter 35 (New)

Proponent: Bonnie Manley, American Iron and Steel Institute

1. Revise as follows:

**SECTION 2210
COLD-FORMED STEEL
LIGHT-FRAMED CONSTRUCTION**

2210.1 General. ~~The design, installation and construction of cold-formed carbon or low-alloy steel, structural and nonstructural steel framing shall be in accordance with AISI-General and AISI-NAS.~~ The design and installation of

structural members and non-structural members utilized in cold-formed steel light frame construction where the specified minimum base steel thickness is between 0.0179 inches (0.455 mm) and 0.1180 inches (2.997 mm) shall be in accordance with AISI S200 and Sections 2210.2 through 2210.7, as applicable.

~~2210.2 Headers Header design. The design and installation of cold-formed steel box headers, back-to-back headers and single and double L headers used in single span conditions for load carrying purposes shall be in accordance with AISI Header, subject to the limitations therein. Headers, including box and back-to-back headers, and double and single L-headers shall be designed in accordance with AISI S212 or in accordance with AISI S100.~~

~~2210.3 Trusses Truss design. The design, quality assurance, installation and testing of cold-formed steel trusses shall be in accordance with AISI Truss, subject to the limitations therein. Trusses shall be designed in accordance with AISI S214.~~

~~2210.4 Wall stud design. The design and installation of cold-formed steel studs for structural and nonstructural walls shall be in accordance with AISI WSD. Wall studs shall be designed in accordance with AISI S211 or in accordance with AISI S100.~~

2. Add new text as follows:

2210.5 Floor and roof system design. Framing for floor and roof systems in buildings shall be designed in accordance with AISI S210 or in accordance with AISI S100.

3. Revise as follows:

~~2210.5 Lateral design. The design of light-framed cold-formed steel walls and diaphragms to resist wind and seismic loads shall be in accordance with AISI Lateral.~~ 2210.6 Lateral design. Light-framed shear walls, diagonal strap bracing that is part of a structural wall and diaphragms to resist wind, seismic and other in-plane lateral loads shall be designed in accordance with AISI S213.

~~2210.6 2210.7 Prescriptive framing. Detached one- and two-family dwellings and townhouses, up to two less than or equal to three stories in height, shall be permitted to be constructed in accordance with AISI-PM S230 subject to the limitations therein.~~

4. Add standard to Chapter 35 as follows:

AISI

S210-07 North American Standard for Cold-formed Steel Framing – Floor and Roof System Design

Reason: In this code change proposal, IBC Sections 2210.1 thru 2210.5 are recommended for deletion and the language from the 2007 edition of AISI S100, Section D4 is inserted with only minor editorial modifications. This new language adopts the 2007 editions of all the AISI Standards for Cold-Formed Steel Framing and provides the appropriate charging language. A brief summary of the changes to the AISI standards is provided below. A more extensive summary can be obtained on the AISI website: www.steel.org.

This code change also makes an editorial change from "light-framed" to "light-frame", which is preferred by the industry. This editorial change should be made throughout the IBC.

Summary of Changes to AISI Standards:

The 2007 editions of the AISI standards for cold-formed steel framing have just been completed. This work by the AISI Committee on Framing Standards includes the revision of six current standards and the issuing two new standards:

Revised Standards:

- AISI S200-07: North American Standard for Cold-Formed Steel Framing – General Provisions
- AISI S211-07: North American Standard for Cold-Formed Steel Framing – Wall Stud Design
- AISI S212-07: North American Standard for Cold-Formed Steel Framing – Header Design
- AISI S213-07: North American Standard for Cold-Formed Steel Framing – Lateral Design
- AISI S214-07: North American Standard for Cold-Formed Steel Framing – Truss Design
- AISI S230-07: Standard for Cold-Formed Steel Framing – Prescriptive Method for One and Two Family Dwellings

New Standards:

- AISI S201-07: North American Standard for Cold-Formed Steel Framing – Product Data
- AISI S210-07: North American Standard for Cold-Formed Steel Framing – Floor and Roof System Design

This summary presents a brief summary of major changes made in the revised standards, and an overview of the new standards.

It should be noted that a new numeric ANSI designation system was initiated with these 2007 edition AISI standards. It is hoped that this will simplify the referencing of the documents in this growing series of design and installation standards.

It should also be noted that the words "North American" are now in the titles of many of these standards. This was done to emphasize that these documents are intended for adoption and use not just in the United States, but also throughout North America. In all such documents, provisions applicable to Canada were added. AISI S200-07: North American Standard for Cold-Formed Steel Framing – General Provisions (Revision of AISI/COFS/GP-2004):

- A2 **Definitions:** Definitions for most of the terms in the various AISI standards for cold-formed steel framing were centralized in this standard to assure consistency and better facilitate maintenance of the series of standards. Definitions for the terms diaphragm, required strength, shear wall and yield strength were revised for consistency with the Standard Definitions for Use in the Design of Steel

Structures (AISI, 2004). The term base metal thickness was revised to base steel thickness. Definitions for the terms non-structural stud and structural stud were replaced with non-structural member and structural member. The definition for the term ridge was revised for consistency and use in all the cold-formed steel framing standards. Definitions for the truss related terms chord splice and pitch break were added.

- A4 **Corrosion Protection:** Language was added to clarify that a dissimilar metal may be used in direct contact with steel framing members if approved for that application, and commentary language was added to provide guidance on when such applications might not be a problem along with a reference regarding the use of stainless steel brick ties (CSA, 2004).
- A5 **Products:** The minimum base metal thickness table was removed and the thickness requirements now defer to an approved design or recognized product standard, such as AISI S201. A statement was added to clarify that the standard designator is intended to be the same when using either U.S. Customary or SI Metric units. A requirement was added that when specifying material for use in structural applications, the material used in design is identified on the contract documents and when ordering the material. Product identification requirements were modified to allow 96-inch spacing of identification in accordance with AISI S201 or ASTM A1003 (ASTM, 2005a) rather than the former 48-inch spacing.
- A6 **Referenced Documents:** The referenced document listing was updated to include AISI S100 (AISI, 2007) and AISI S201. ASTM references were updated. ASTM C954 (ASTM, 2004a) and C1002 (ASTM, 2004b) for screw fasteners for gypsum board attachment were added to the listing.
- C1 **In-Line Framing:** Commentary language was added to provide guidance on the use of load bearing top track assemblies, based on testing programs at the NAHB Research Center (NAHB, 2003) and the University of New Brunswick (Dawe, 2005).
- C3 **Installation Tolerances:** Commentary language was added to provide guidance on the wall stud gap tolerance, based on a testing program at the University of Missouri-Rolla (Findlay, 2005).
- D1 **Screw Connections:** In Section D1.6, requirements were added to reference the applicable ASTM standards for screw fasteners for gypsum board attachment.
- AISI S201-07: North American Standard for Cold-Formed Steel Framing – Product Data (New Standard, not intended for direct adoption in the IBC.):
- A **General:** This standard is intended to establish and encourage the production and use of standardized products in the United States, Canada and Mexico. It provides criteria, including material and product requirements for cold-formed steel C-shape studs, joists, track, U-channels, furring channels and angles intended to be utilized in structural and non-structural framing applications.
- B. **Materials:** This standard defines standard material grades and specifications, minimum base steel and design thickness, and coatings for corrosion protection.
- C. **Products:** This standard defines standard product designator, shapes, inside bend radius, lip length, punchouts, marking and manufacturing tolerances.
- D. **Quality Assurance:** This standard requires a properly documented quality control program and the proper application of quality assurance procedures.
- AISI S210-07: North American Standard for Cold-Formed Steel Framing – Floor and Roof System Design (New Standard):
- A. **General:** This standard is intended for the design and installation of cold-formed steel framing for floor and roof systems in buildings. The standard defers to AISI S100 (AISI, 2007), except when modified by the standard. Designing solely in accordance with AISI S100 is cited as an alternative to the standard.
- B. **Design:** This standard provides requirements for floor joists, ceiling joists and roof rafters are provided for both a discretely braced design; i.e., neglecting the structural bracing and/or composite-action contribution of attached sheathing or deck, or a continuously braced design. Provisions are provided for clip angle bearing stiffeners, based on a recent testing program at the University of Waterloo (Fox, 2006); and for bracing, based on available research, field experience and the requirements of AISI S100.
- C. **Installation:** This standard has no specific installation requirements beyond those of AISI S200.
- AISI S211-07: North American Standard for Cold-Formed Steel Framing – Wall Stud Design (Revision of AISI/COFS/WSD-2004):
- A1 **Scope:** A sentence was added to clarify that designing solely in accordance with AISI S100 (AISI, 2007) is an alternative to this standard.
- A2 **Definitions:** Definitions for terms used in this standard were removed from this section and centralized in AISI S200.
- A3 **Loads and Load Combinations:** For consistency with the other AISI standards for cold-formed steel framing, the requirements of former Section B on Loading were moved to this new section. Former Sections C and D were renamed Sections B and C, accordingly. Wind loading considerations were separated into Subsection A3.1 for clarity, since these provisions are not intended for use in Canada.
- A4 **Referenced Documents:** The referenced document listing was updated to include AISI S100 (AISI, 2007) and AISI S200. The ASCE 7 (ASCE, 2006) reference was updated.
- B **Design:** Former requirements for materials and corrosion protection, which merely referred the user to AISI S200, were deemed unnecessary and were deleted. A statement was added to emphasize that unless modified or supplemented in this standard, strength determinations are to be made in accordance with AISI S100.
- B2 **Connection Design:** Section B2.3 was revised to clarify that web crippling the stud must be evaluated in accordance with AISI S100 and requirements on bearing length were added. In Section B2.3, additional limitations on the methodology were added that are consistent with the original testing.
- AISI S212-07: North American Standard for Cold-Formed Steel Framing – Header Design (Revision of AISI/COFS/HEADER-2004):
- A1 **Scope:** For consistency with the other AISI standards for cold-formed steel framing, the requirements of former Section A1.1 were moved to the appropriate portions of Sections B and C. Commentary language was added to emphasize the limited scope of this standard and to provide guidance on the broader subject of opening design, including a reference to the Cold-Formed Steel Framing Design Guide (AISI, 2002).
- A2 **Definitions:** This new section was added to clarify that definitions for terms used in this standard are listed in AISI S200.
- A4 **Referenced Documents:** The referenced document listing was updated to include AISI S100 (AISI, 2007) and AISI S200. The ASCE 7 (ASCE, 2006) reference was updated.
- B1 **Back-to-Back Headers:** In Sections B1.2 and B1.4, requirements for evaluating shear in accordance with AISI S100 were added.
- B2 **Box Headers:** In Sections B2.2 and B2.4, requirements for evaluating shear in accordance with AISI S100 were added.
- B3 **Double L-Headers:** Limitations, from former Section A1.1, were added.
- B4 **Single L-Headers:** Limitations, from former Section A1.1, were added.
- B5 **Inverted L-Header Assemblies:** This new section was added to provide provisions for designing inverted L-header assemblies, based on rational engineering judgment, as a means to provide improved capacity for double and single L-headers.
- C1 **Back-to-Back and Box Headers:** Installation requirements for back-to-back and box headers, from former Section A1.1, were included in this new section.
- C2 **Double and Single L-Headers:** Installation requirements for double and single L-headers, from former Section A1.1, were included in this new section.
- C3 **Inverted L-Header Assemblies:** This new section was added to provide provisions for installing inverted L-header assemblies.
- AISI S213-07: North American Standard for Cold-Formed Steel Framing – Lateral Design (Revision of AISI/COFS/LATERAL-2004):
- A1 **Scope:** The scope was expanded to include shear walls and diaphragms resisting other in-plane lateral loads (i.e., other than wind or seismic) and provisions for such were added throughout the standard.

- A2 **Definitions:** Definitions for most of the terms used in this standard were removed from this section and centralized in AISI S200.
- A4 **Loads and Load Combinations:** This section, previously B2, was moved and expanded for consistency with the other AISI standards.
- A5 **Referenced Documents:** The referenced document listing was updated to include AISI S100 (AISI, 2007) and AISI S200. The ASCE 7 (ASCE, 2006) and various ASTM and other references were updated. References for the applicable standards for gypsum board (ASTM, 2006), fiberboard (AHA, 1995 and ASTM, 2001), screw fasteners (ASTM, 2004b; ASTM, 2004c) and cyclic testing (ASTM, 2005b) were added.
- C2 **Available Shear Strength:** The provisions regarding openings in and aspect ratios of Type I shear walls and wall piers in Type II shear walls were clarified. The equation for design deflection was revised to include the vertical deformation rather than the deflection of anchorage/attachment details. A correction was made to the tabulated maximum aspect ratio (h/w) for 0.027" steel sheet, one side in Table C2.1-1. Provisions for 15/32" Structural 1 sheathing (4-ply), one side with 68-mil framing were added. Provisions for fiberboard sheathed shear walls were added, based on tests at the NAHB Research Center (NAHB, 2005). Limitations to section C2.2 to specify the minimum size of framing screws were added. The requirement for the attachment of sheathing edges was clarified. The minimum requirements for flat strapping when used as blocking in a Type I shear wall were defined. A requirement was added that for other than steel sheathing, the screws be installed through the sheathing to the blocking. Commentary was added to clarify that the standard permits the use of studs with standard punchouts and anchor bolts with standard cut washers. Commentary was also added to warn against the overdriving of sheathing screws.
- C5 **Special Seismic Requirements:** The anchorage requirement was clarified as being applicable to uplift only. A special requirement for shear walls that perimeter members at openings be provided and detailed to distribute the shearing stresses was deemed redundant for Type I shear walls and incorrect for Type II walls and was deleted. Provisions for shear walls and diagonal strap bracing were separated into Sections C5.1 and C5.2. Additional special seismic requirements for diagonal strap bracing were introduced based largely on research at McGill University (Al-Kharat and Rogers, 2005, 2006, 2007), other available research and engineering judgment. Factors for the expected yield strength and tensile strength of diagonal strap bracing members were added, based in part on similar values published for hot-rolled structural steel materials (AISC, 2005). Provisions for seismic forces contributed by masonry and concrete walls, and other than concrete or masonry construction were added to new Sections C5.3 and C5.4. These requirements were patterned after provisions in the Special Design Provisions for Wind and Seismic (AFPA, 2005).
- D2 **Diaphragm Design:** A requirement was added that for other than steel sheathing, the screws be installed through the sheathing to the blocking. Commentary was added to justify diaphragm values in light of changes to the recognized screw connection strength calculation methodology.
- AISI S214-07: North American Standard for Cold-Formed Steel Framing – Truss Design (Revision of AISI/COFS/TRUSS-2004):
- A2 **Definitions:** Definitions for terms used in this standard were removed from this section and centralized in AISI S200.
- A4 **Referenced Documents:** The referenced document listing was updated to include AISI S100 (AISI, 2007) and AISI S200. The ASCE 7 (ASCE, 2006) reference was updated.
- D4 **Member Design:** Sections D4.2, D4.3, D4.4 and D4.5 were revised to clarify when members are to be evaluated for axial load alone, bending alone, and combined axial load and bending using the provisions of AISI S100. Section D4.4 was revised and Commentary language was added to clarify the requirements for trusses with C-shaped chord and web members.
- D5 **Gusset Plate Design:** This new section was added to provide provisions for designing gusset plates, based on based on a testing program at the University of Missouri-Rolla (Lutz, 2004).
- G3 **Full-Scale Structural Performance Load Test:** In Section G3.2, the required minimum number of test specimens was changed from two to three. In Section G3.7, the special Beta-factors for trusses were deleted and the user is deferred instead to Chapter F1 of AISI S100.
- AISI S230-07: Standard for Cold-Formed Steel Framing – Prescriptive Method for One and Two Family Dwellings (Revision of AISI/COFS/PM-2006):
- A1 **Scope:** The allowable number of stories was increased from two to three stories and provisions for such were added throughout the standard. The maximum story height was defined. Language was added to better describe how to handle an irregularity in a high seismic or high wind area that is isolated to a portion of a building.
- A2 **Definitions:** Definitions for most terms used in this standard were removed from this section and centralized in AISI S200. Definitions for seismic design category D0 and wind exposures B, C and D were added and the definition for seismic design category D1 was revised, in accordance with the building code.
- A3 **Referenced Documents:** The referenced document listing was updated to include AISI S100 (AISI, 2007), AISI S200, AISI S201 and AISI S214. The ASCE 7 (ASCE, 2006) and various ASTM and other references were updated. Reference for the applicable standard for anchor bolts (ASTM, 2004d) was added.
- A4 **Limitations of Framing Members:** Language was updated to reflect the new AISI S201 and ASTM A1003 (ASTM, 2005a) standards. Provisions for hole reinforcing were added and provisions for hole patching were revised, based on available research and engineering judgment.
- B2 **Bearing Stiffeners:** Requirements for C-shaped and track bearing stiffeners were revised, based on available research and engineering judgment. Provisions were added for clip angle bearing stiffeners, based on a recent testing program at the University of Waterloo (Fox, 2006).
- B4 **Anchor Bolts:** Provisions were added regarding anchor bolt washers in high wind areas and high seismic areas.
- D2 **Floor to Foundation or Structural Wall Connection:** Provisions were added to allow a single joist with bearing stiffeners in lieu of double joists on foundation walls parallel to the joist span.
- E2: **Wall to Foundation or Floor Connection:** Provisions were added for anchoring gable endwalls, based on a study at the University of Missouri-Rolla (Downey, Stephens and LaBoube, 2005).
- E3: **Wall Stud Sizes:** Tables were updated to the latest editions of AISI S100 (AISI, 2007), AISI S211 and ASCE 7 (ASCE, 2006). Provisions were added for sizing wall studs in gable endwalls, based on a study at the University of Missouri-Rolla.
- E7 **Headers:** Tables were updated to the latest editions of AISI S100, AISI 212 and ASCE 7. Tables were added for grade 50 members. Provisions were added for single L-headers and inverted L-header assemblies. Clarification was made that provisions for head tracks also apply to sill tracks. Provisions were added for sizing and installing headers in gable endwalls, based on a study at the University of Missouri-Rolla.
- E11 **Braced Walls In High Wind Areas and High Seismic Areas:** Provisions were revised to clarify that braced wall length adjustment factors based upon edge screw spacing less than 4 inches are not applicable to type II braced walls.
- F3 **Roof Rafters:** Tables were updated to the latest editions of AISI S100, AISI S210 and ASCE 7. Tables were added for grade 50 members. Limits were set on the rake overhang in gable endwalls, based on a study at the University of Missouri-Rolla.
- F4 **Hip Framing:** A new section was added to address hip framing, based on a study at the University of Missouri-Rolla (Waldo, Stephens and LaBoube, 2006).
- F6 **Ceiling and Roof Diaphragms:** Ceiling diaphragm design and installation requirements were added for gable endwalls, based on a study at the University of Missouri-Rolla.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Note: The following analysis was not in the Code Change Proposal book but was posted on the ICC website.

Analysis: Review of proposed new standard AISI S210-07 indicated that, in the opinion of ICC Staff, the standard did comply with ICC standards criteria.

Committee Action:

Approved as Modified

Modify proposal as follows:

2210.6 Lateral design. Light-framed shear walls, diagonal strap bracing that is part of a structural wall and diaphragms used to resist wind, seismic and other in-plane lateral loads shall be designed in accordance with AISI S213.

2210.7 Prescriptive framing. Detached one- and two-family dwellings and townhouses, less than or equal to three stories ~~in height~~ above grade plane, shall be permitted to be constructed in accordance with AISI S230 subject to the limitations therein.

(Portions of proposal not shown remain unchanged)

Committee Reason: This code change correlates the IBC section on cold-formed steel with the latest editions of AISI standards and adds the new standard for floor and roof framing. The modification makes editorial changes, providing terminology that is consistent with other code provision.

Assembly Action:

None

Final Hearing Results

S208-07/08

AM

Code Change No: S209-07/08

Original Proposal

Section: 2210.3

Proponent: Edwin Huston, National Council of Structural Engineers Association (NCSEA), representing NCSEA Code Advisory Committee – General Engineering Subcommittee

1. Revise as follows:

2210.3 Trusses. ~~The design, quality assurance, installation and testing of cold-formed steel trusses shall be in accordance with AISI Truss, subject to the limitations therein. Cold-formed steel trusses shall be designed in accordance with the provisions of this code and accepted engineering practice. Members are permitted to be joined by screws, pins, rivets, bolts, clinching, welding, or other approved connecting devices.~~

2. Add new text as follows:

2210.3.1 Truss design drawings. The written, graphic and pictorial depiction of each individual truss shall be provided to the building official for approval prior to installation. The truss design drawings shall also be provided with the shipment of trusses delivered to the job site. Truss design drawings shall include, at a minimum, the information specified below:

1. Slope or depth, span and spacing;
2. Location of all joints and support locations;
3. Number of plies if greater than one;
4. Required bearing widths;
5. Design loads as applicable, including;

- 5.1. Top chord live load (including snow loads);
- 5.2. Top chord dead load;
- 5.3. Bottom chord live load;
- 5.4. Bottom chord dead load;
- 5.5. Additional loads and locations;
- 5.6. Environmental design criteria and loads (wind, snow, seismic, etc.); and
- 5.7. Other lateral loads, including drag strut loads.
6. Maximum reaction force and direction, including maximum uplift reaction forces where applicable;
7. All truss joint connections, information and details;
8. Member sizes, properties and details;
9. Truss- to- truss connections and truss field assembly requirements.
10. Calculated span to deflection ratio and maximum vertical and horizontal deflection for live and total load as applicable;
11. Maximum axial tension and compression in the truss members; and
12. Required permanent individual truss member restraint locations and the method and details of restraint/bracing to be used in accordance with Section 2210.3.2.

2210.3.2 Permanent individual truss member restraint/bracing. Where permanent restraint/bracing of truss members is specified on the truss design drawings, it shall be accomplished by one of the following methods:

1. Permanent individual truss member restraint/bracing shall be installed using standard industry lateral restraint/bracing details in accordance with generally accepted engineering practice. Locations for lateral restraint shall be identified on the truss design drawing.
2. The trusses shall be designed so that the buckling of any individual truss member is resisted internally by the individual truss through suitable means (i.e., buckling reinforcement by T-reinforcement or L-reinforcement, proprietary reinforcement, etc.). The buckling reinforcement of individual members of the trusses shall be installed as shown on the truss design drawing or on supplemental truss member buckling reinforcement details provided by the truss designer.
3. A project specific permanent individual truss member restraint/bracing design shall be permitted to be specified by any registered design professional.

2210.3.3 Trusses spanning 60 feet or greater. The owner shall contract with a registered design professional for the design of the temporary installation restraint/bracing and the permanent individual truss member restraint/bracing for trusses with clear spans 60 feet (18 288mm) or greater.

2210.3.4 Truss designer. The individual or organization responsible for the design of the trusses.

2210.3.5 Truss design drawings. Where required by the registered design professional, the building official, or the statutes of the jurisdiction in which the project is to be constructed, each individual truss design drawing shall bear the seal and signature of the truss designer.

Exceptions:

1. Where a cover sheet and truss index sheet are combined into a single sheet and attached to the set of truss design drawings, the single cover/truss index sheet is the only document required to be signed and sealed by the truss designer.
2. When a cover sheet and a truss index sheet are separately provided and attached to the set of truss design drawings, the cover sheet and the truss index sheet are the only documents required to be signed and sealed by the truss designer.

2210.3.6 Truss placement diagram. The truss manufacturer shall provide a truss placement diagram that identifies the proposed location for each individually designated truss and references the corresponding truss design drawing. The truss placement diagram shall be provided as part of the truss submittal package, and with the shipment of trusses delivered to the job site. Truss placement diagrams that serve only as a guide for installation and do not deviate from the permit submittal drawings shall not be required to bear the seal or signature of the truss designer.

2210.3.7 Truss submittal package. The truss submittal package shall consist of each individual truss design drawing; the truss placement diagram; the permanent individual truss member restraint/bracing method and details; any other structural details germane to the trusses as applicable; and the cover/truss index sheet.

2210.3.8 Anchorage. The design for the transfer of loads and anchorage of each truss to the supporting structure is the responsibility of the registered design professional.

2210.3.9 Alterations to trusses. Truss members and components shall not be cut, notched, drilled, spliced or otherwise altered in any way without written concurrence and approval of a registered design professional. Alterations resulting in the addition of loads to any member (i.e. HVAC equipment, piping, additional roofing or insulation, etc.) shall not be permitted without verification that the truss is capable of supporting such additional loading.

2210.3.10 AISI specification. In addition to Sections 2210.3 through 2210.3.9, the design, manufacture, installation, testing and quality assurance of cold formed steel trusses shall be in accordance with AISI S214. Job-site inspections shall be in compliance with Section 109 as applicable.

2210.3.11 Truss quality assurance. Trusses not part of a manufacturing process in accordance with Section 2210.3.10 or in accordance with a standard listed in Chapter 35, which provides requirements for quality control done under the supervision of a third party quality control agency, shall be manufactured in compliance with Sections 1704.2 and 1704.3 as applicable.

Reason: This language is proposed to be added in order for cold formed steel trusses to have compatible criteria as the requirements for wood trusses specified in Section 2303.4. The current Section does not provide the necessary criteria and delineation of responsibilities.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The addition of requirements for truss design drawings and submittals is an important clarification for cold-formed steel that is similar to the current requirements for wood trusses.

Assembly Action:

None

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because public comments were submitted.

Public Comment 1:

Edwin Huston, National Council of Structural Engineers Association (NCSEA), representing NCSEA Code Advisory Committee, General Engineering Subcommittee, requests Approval as Modified by this Public Comment.

Modify proposal as follows:

~~2210.3 Trusses. Cold-formed steel trusses shall be designed in accordance with the provisions of this code and accepted engineering practice. Members are permitted to be joined by screws, pins, rivets, bolts, clinching, welding, or other approved connecting devices.~~

2210.3.1 Design. Cold-Formed Steel Trusses shall be designed in accordance with AISI S214, Sections 2210.3.1 through 2210.3.5 and accepted engineering practice.

2210.3.1 Truss design drawings. The written, graphic and pictorial depiction of each individual truss shall be provided to the building official for approval prior to installation. The truss design drawings shall also be provided with the shipment of trusses delivered to the job site. Truss design drawings shall include, at a minimum, the information specified below:

1. ~~Slope or depth, span and spacing;~~
2. ~~Location of all joints and support locations;~~
3. ~~Number of plies if greater than one;~~
4. ~~Required bearing widths;~~
5. ~~Design loads as applicable, including:~~
 - 5.1. ~~Top chord live load (including snow loads);~~
 - 5.2. ~~Top chord dead load;~~
 - 5.3. ~~Bottom chord live load;~~
 - 5.4. ~~Bottom chord dead load;~~

- 5.5. — Additional loads and locations;
- 5.6. — Environmental design criteria and loads (wind, snow, seismic, etc.); and
- 5.7. — Other lateral loads, including drag strut loads;
6. — Maximum reaction force and direction, including maximum uplift reaction forces where applicable;
7. — All truss joint connections, information and details;
8. — Member sizes, properties and details;
9. — Truss to truss connections and truss field assembly requirements;
10. — Calculated span to deflection ratio and maximum vertical and horizontal deflection for live and total load as applicable;
11. — Maximum axial tension and compression in the truss members; and
12. — Required permanent individual truss member restraint locations and the method and details of restraint/bracing to be used in accordance with Section 2210.3.2.

2210.3.2 Truss Design Drawings. The Truss Design Drawings shall conform to the requirements of Section B2.3 of AISI S214 and shall be provided with the shipment of trusses delivered to the job site. The Truss Design Drawings shall include the details of permanent individual truss member restraint/bracing in accordance with section B6(a) or B6(c) of AISI S214 if these methods are utilized to provide restraint/bracing.

2210.3.2 Permanent individual truss member restraint/bracing. Where permanent restraint/bracing of truss members is specified on the truss design drawings, it shall be accomplished by one of the following methods:

1. — Permanent individual truss member restraint/bracing shall be installed using standard industry lateral restraint/bracing details in accordance with generally accepted engineering practice. Locations for lateral restraint shall be identified on the truss design drawing.
2. — The trusses shall be designed so that the buckling of any individual truss member is resisted internally by the individual truss through suitable means (i.e., buckling reinforcement by T reinforcement or L reinforcement, proprietary reinforcement, etc.). The buckling reinforcement of individual members of the trusses shall be installed as shown on the truss design drawing or on supplemental truss member buckling reinforcement details provided by the truss designer.
3. — A project specific permanent individual truss member restraint/bracing design shall be permitted to be specified by any registered design professional.

2210.3.3 Deferred Submittals. AISI Section B4.2 shall be deleted.

2210.3.3 2210.3.4 Trusses spanning 60 feet or greater. The owner shall contract with a registered design professional for the design of the temporary installation restraint/bracing and the permanent individual truss member restraint/bracing for trusses with clear spans 60 feet (18 288mm) or greater. Special inspection of trusses over 60 feet in length shall conform to Section 1704.

2210.3.4 Truss designer. The individual or organization responsible for the design of the trusses.

2210.3.5 Truss design drawings. Where required by the registered design professional, the building official, or the statutes of the jurisdiction in which the project is to be constructed, each individual truss design drawing shall bear the seal and signature of the truss designer.

Exceptions:

1. — Where a cover sheet and truss index sheet are combined into a single sheet and attached to the set of truss design drawings, the single cover/truss index sheet is the only document required to be signed and sealed by the truss designer.
2. — When a cover sheet and a truss index sheet are separately provided and attached to the set of truss design drawings, the cover sheet and the truss index sheet are the only documents required to be signed and sealed by the truss designer.

2210.3.6 Truss placement diagram. The truss manufacturer shall provide a truss placement diagram that identifies the proposed location for each individually designated truss and references the corresponding truss design drawing. The truss placement diagram shall be provided as part of the truss submittal package, and with the shipment of trusses delivered to the job site. Truss placement diagrams that serve only as a guide for installation and do not deviate from the permit submittal drawings shall not be required to bear the seal or signature of the truss designer.

2210.3.7 Truss submittal package. The truss submittal package shall consist of each individual truss design drawing; the truss placement diagram; the permanent individual truss member restraint/bracing method and details; any other structural details germane to the trusses as applicable; and the cover/truss index sheet.

2210.3.8 Anchorage. The design for the transfer of loads and anchorage of each truss to the supporting structure is the responsibility of the registered design professional.

2210.3.9 Alterations to trusses. Truss members and components shall not be cut, notched, drilled, spliced or otherwise altered in any way without written concurrence and approval of a registered design professional. Alterations resulting in the addition of loads to any member (i.e. HVAC equipment, piping, additional roofing or insulation, etc.) shall not be permitted without verification that the truss is capable of supporting such additional loading.

2210.3.10 AISI specification. In addition to Sections 2210.3 through 2210.3.9, the design, manufacture, installation, testing and quality assurance of cold formed steel trusses shall be in accordance with AISI S214. Job site inspections shall be in compliance with Section 109 as applicable.

2210.3.11 2210.3.5 Truss quality assurance. Trusses not part of a manufacturing process in accordance with Section 2210.3.10 or in accordance with a standard listed in Chapter 35, which that provides requirements for quality control done under the supervision of a third party quality control agency, shall be manufactured in compliance with Sections 1704.2 and 1704.3 as applicable.

Commenter's Reason: Over the past year, NCSEA has been working diligently with both AISI and WTCA to address their concerns surrounding the truss design requirements in S209 as compared to those found in AISI S214-07, North American Standard for Cold-Formed Steel Framing – Truss Design. Unfortunately, the language that the IBC Structural Code Development Committee accepted as submitted in Proposal S209-07/08 does not recognize the latest work by the three organizations. The modifications presented in this public comment correct IBC Section 2210.3 to reflect the established consensus on this topic, where such consensus could be reached within this short timeframe.

In response to Proposal S209-07/08, AISI agreed to process a supplement to AISI S214-07 addressing both NCSEA's and WTCA's concerns. Supplement 2 to AISI S214-07 was issued June 9, 2008 and is available for download from the AISI website: www.aisi.org. The following topics, which were originally presented in Proposal S209-07/08, were picked up with some minor modification in AISI S214, Supplement 2 and, consequently, are recommended for deletion from IBC Section 2210.3:

- Truss design drawings (2210.3.1) – Other than pointing the user to S214, stating that the details need to be shipped to the jobsite, and pointing out that restraint/bracing details need to be provided, this topic is addressed in AISI S214, Supplement 2, Section B2.
- Permanent individual truss member restraint/bracing (2210.3.2) – The topic is addressed in AISI S214, Supplement 2, Section B6.
- Truss designer (2210.3.4) – The topic is addressed in AISI S214, Supplement 2, Section B2.
- Truss design drawings (2210.3.5) – The topic is addressed in AISI S214, Supplement 2, Section B2
- Truss placement diagram (2210.3.6) – The topic is addressed in AISI S214, Supplement 2, Section B3.
- Truss submittal package (2210.3.7) – The topic is addressed in AISI S214, Supplement 2, Section B3.
- Anchorage (2210.3.8) – The topic is addressed in AISI S214, Supplement 2, Section B4.
- Alterations to trusses (2210.3.9) – The topic is addressed in AISI S214, Supplement 2, Section B5.
- AISI Specification (2210.3.10) – The reference to AISI S214 has been relocated to IBC Section 2210.3. It is considered that a pointer to IBC Section 109 is unnecessary

This Public Comment deletes Section B4.2, because when the Contract Drawings are submitted for permit, the Registered Design Professional may not know what items will be designated as deferred submittals. In addition, it is inappropriate for AISI Section B4.2 for cold-formed trusses to list requirements for deferred submittals on other items or materials.

During the development of Supplement 2, two topics were determined to be outside the jurisdiction of the AISI Committee on Framing Standards, the committee responsible for AISI S214. Consequently, they have been retained for inclusion in IBC Section 2210.3. They are:

- Design of Trusses spanning 60 feet or greater (2210.3.3) – AISI S214 covers the topic of permanent not temporary installation restraint/bracing. However, S209 put this under design. In this Public Comment it has been retained as 2210.3.3.
- Truss quality assurance (2210.3.11) – AISI S214, Chapter E provides requirements for Quality Criteria for Steel Trusses that are part of a manufacturing process. This section addresses trusses that fall outside of those processes. In this Public Comment it has been moved to 2210.3.4.

Please note, the modifications presented here coordinate with the changes accepted by the IBC Structural Code Development Committee in Proposal S208-07/08. Also, to fully integrate AISI S214-07, Supplement 2 into the IBC, a public comment has been submitted on Proposal S238-07/08 adopting the supplement in IBC Chapter 35.

Final Hearing Results

S209-07/08

AMPC1

Code Change No: S214-07/08

Original Proposal

Sections: 2303.2.1 (New), 2303.2.2 (New), 2303.2.3 (New); IRC R802.1.3.1 (New), R802.1.3.2 (New), R802.1.3.3 (New)

Proponent: Joseph T. Holland, III, Hoover Treated Wood Products, representing Hoover Treated Wood Products

THESE PROPOSALS ARE ON THE AGENDA OF THE IBC STRUCTURAL AND THE IRC BUILDING/ENERGY CODE DEVELOPMENT COMMITTEES AS 2 SEPARATE CODE CHANGES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IBC STRUCTURAL

Add new text as follows:

2303.2 (Supp) Fire-retardant-treated wood. Fire-retardant-treated wood is any wood product which, when impregnated with chemicals by a pressure process or other means during manufacture, shall have, when tested in accordance with ASTM E 84 or UL 723, a listed flame spread index of 25 or less and show no evidence of significant progressive combustion when the test is continued for an additional 20-minute period. In addition, the flame front shall not progress more than 10.5 feet (3200 mm) beyond the centerline of the burners at any time during the test.

2303.2.1 Pressure process. For wood products impregnated with chemicals by a pressure process, the process shall be performed in closed vessels under pressures considerably above atmospheric.

2303.2.2 Other means during manufacture. For wood products produced by other means during manufacture the treatment shall be an integral part of the manufacturing process of the wood product. The treatment shall provide permanent protection to all surfaces of the wood product.

2303.2.3 Testing. For wood products produced by other means during manufacture, other than a pressure process, all sides of the wood product shall be tested in accordance with and produce the results required in Section 2303.2. Wood structural panels shall be permitted to test only the front and back faces.

(Renumber subsequent sections)

PART II – IRC BUILDING/ENERGY

Add new text as follows:

R802.1.3 Fire-retardant-treated wood. Fire-retardant treated wood (FRTW) is any wood product which, when impregnated with chemicals by a pressure process or other means during manufacture, shall have, when tested in accordance with ASTM E 84, a listed flame spread index of 25 or less and shows no evidence of significant progressive combustion when the test is continued for an additional 20-minute period. In addition, the flame front shall not progress more than 10.5 feet (3200 mm) beyond the center line of the burners at any time during the test.

R802.1.3.1 Pressure process. For wood products impregnated with chemicals by a pressure process, the process shall be performed in closed vessels under pressures considerably above atmospheric.

R802.1.3.2 Other means during manufacture. For wood products produced by other means during manufacture the treatment shall be an integral part of the manufacturing process of the wood product. The treatment shall provide permanent protection to all surfaces of the wood product.

R802.1.3.3 Testing. For wood products produced by other means during manufacture, other than a pressure process, all sides of the wood product shall be tested in accordance with and produce the results required in Section R802.1.3. Wood structural panels shall be permitted to test only the front and back faces.

(Renumber subsequent sections)

Reason: Purpose: Clarify the meaning of the phrase “pressure process or other means during manufacture” and provide testing requirements of treatments not impregnated by a pressure process in accordance with 2303.2 (R802.1.3 IRC).

Fire-retardant-treated wood is permitted for applications where noncombustible materials are required. It is a building and life safety issue. It is essential that any product used for such applications meet rigorous requirements insuring it will perform as expected. Equivalent performance from all sides insures installation is not a factor or which direction a fire is supposed to come from does not become an issue.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

PART I – IBC STRUCTURAL

Committee Action:

Disapproved

Committee Reason: The intent to clarify the methods of fire retardant treatment may be good, but the proposed wording is not appropriate code language. Also enforcers would need some way to identify complying products in the field.

Assembly Action:

None

PART II – IRC B/E

Committee Action:

Disapproved

Committee Reason: The term "considerable" is ambiguous and unenforceable. There is no definition of the term "other means".

Assembly Action:

None

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Joseph Holland, Hoover Treated Wood Products, requests Approval as Modified by this Public Comment for Part I.

Modify proposal as follows:

2303.2 Fire-retardant-treated wood. Fire-retardant-treated wood is any wood product which, when impregnated with chemicals by a pressure process or other means during manufacture, shall have, when tested in accordance with ASTM E 84 or UL 723, a listed flame spread index of 25 or less and show no evidence of significant progressive combustion when the test is continued for an additional 20-minute period. In addition, the flame front shall not progress more than 10.5 feet (3200 mm) beyond the centerline of the burners at any time during the test.

2303.2.1 Pressure process. For wood products impregnated with chemicals by a pressure process, the process shall be performed in closed vessels under pressures not less than 50 pounds per square inch gage (psig) ~~considerably above atmospheric.~~

2303.2.2 Other means during manufacture. For wood products produced by other means during manufacture the treatment shall be an integral part of the manufacturing process of the wood product. The treatment shall provide permanent protection to all surfaces of the wood product.

2303.2.2 Testing. For wood products produced by other means during manufacture, other than a pressure process, all sides of the wood product shall be tested in accordance with and produce the results required in Section 2303.2. Wood structural panels shall be permitted to test only the front and back faces.

Commenter's Reason: The Structural Committee felt the language needed clarifying. This comment eliminates the nontechnical language. The committee also questioned how a code official would enforce the provisions. Section 2303.2.1 requires a label. The label must comply with the provision of Chapter 17. If a product doesn't have a label from an approved agency it does not meet the code.

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Joseph Holland, Hoover Treated Wood Products, requests Approval as Modified by this public comment for Part II.

Modify proposal as follows:

R802.1.3 Fire-retardant-treated wood. Fire-retardant-treated wood is any wood product which, when impregnated with chemicals by a pressure process or other means during manufacture, shall have, when tested in accordance with ASTM E 84 or UL 723, a listed flame spread index of 25 or less and show no evidence of significant progressive combustion when the test is continued for an additional 20-minute period. In addition, the flame front shall not progress more than 10.5 feet (3200 mm) beyond the centerline of the burners at any time during the test.

R802.1.3.1 Pressure process. For wood products impregnated with chemicals by a pressure process, the process shall be performed in closed vessels under pressures not less than 50 pounds per square inch gauge (psig) ~~considerably above atmospheric.~~

R802.1.3.2 Other means during manufacture. For wood products produced by other means during manufacture the treatment shall be an integral part of the manufacturing process of the wood product. The treatment shall provide permanent protection to all surfaces of the wood product.

R802.1.3.3 Testing. For wood products produced by other means during manufacture, other than a pressure process, all sides of the wood product shall be tested in accordance with and produce the results required in Section 2303.2. Wood structural panels shall be permitted to test only the front and back faces.

**DEFINITIONS
R202**

FIRE-RETARDANT-TREATED WOOD. Pressure-treated lumber and plywood that exhibit reduced surface burning characteristics and resist propagation of fire.

Pressure process. A process for treating wood using an initial vacuum followed by the introduction of pressure above atmospheric.

Other means during manufacture. A process where the wood raw material is treated with a fire-retardant formulation while undergoing creation as a finished product.

Commenter's Reason: Revisions are submitted to address the Residential Code Committee's comments. They stated the term "considerable" was ambiguous and felt definitions were needed.

Final Hearing Results

**S214-07/08, Part I
S214-07/08, Part II**

**AMPC
AMPC**

Code Change No: **S216-07/08**

Original Proposal

Sections: 2303.4.1.1, 2303.4.1.2, 2303.4.1.3, 2303.4.1.4, 2303.4.1.4.1, 2303.4.2, 2303.4.3, 2303.4.4, 2303.4.5, 2303.4.6, 2303.4.7

Proponent: Edwin T. Huston, Smith & Huston, Inc., representing the National Council of Structural Engineering Associations

Revise as follows:

2303.4.1.1 (Supp) Truss design drawings. The written, graphic and pictorial depiction of each individual truss shall be provided to the building official for approval prior to installation. Truss design drawings shall also be provided with the shipment of trusses delivered to the job site. Truss design drawings shall include, at a minimum, the information specified below:

1. Slope or depth, span and spacing;
2. Location of all joints and support locations;
- ~~3.~~ Number of plies if greater than one;
- ~~3-4.~~ Required bearing widths;
- 4-5. Design loads as applicable, including:
 - ~~4-1-5.1.~~ Top chord live load (for roof trusses, this shall be the controlling case of live load or including snow loads);
 - ~~4-2-5.2.~~ Top chord dead load;
 - ~~4-3-5.3.~~ Bottom chord live load;
 - ~~4-4-5.4.~~ Bottom chord dead load;
 - ~~4-5-5.5.~~ Additional loads and locations Concentrated loads and their points of application as applicable; and
 - ~~4-6-5.6.~~ Environmental design criteria and loads (wind, snow, seismic, etc.) Controlling wind and earthquake loads as applicable.
- ~~6.~~ Other lateral loads, including drag strut loads.
- ~~5-7.~~ Adjustments to wood member and metal connector plate design value for conditions of use;
- ~~6-8.~~ Each Maximum reaction force and direction, including maximum uplift reaction forces where applicable;
- ~~7-9.~~ Metal connector plate type, size, and thickness or gage, and the dimensioned location of each metal connector plate except where symmetrically located relative to the joint interface;
- ~~8-10.~~ Size, species and grade for each wood member;
- ~~9-11.~~ Truss-to-truss connections and truss field assembly requirements
 - ~~Specific connection capacities or connection capacities required for:~~
 - ~~9.1. — Truss to truss girder;~~
 - ~~9.2. — Truss ply to ply; and~~
 - ~~9.3. — Field assembly of a truss when the truss shown on the individual truss design drawing is supplied in separate pieces that will be field connected.~~
- ~~10-12.~~ Calculated span to deflection ratio and maximum vertical and horizontal deflection for live and total load as applicable;
- ~~11-13.~~ Maximum axial tension and compression forces in the truss members; and
- ~~12-14.~~ Required permanent individual truss member restraint location and the method and details of restraint/bracing to be used per Section 2303.4.1.2, unless a specific truss member permanent bracing plan for the roof or floor structural system is provided by a registered design professional.

2303.4.1.2 (Supp) Permanent individual truss member restraint. Where permanent restraint of truss members is required on the truss design drawings, it shall be accomplished by one of the following methods:

- ~~1.~~ The trusses shall be designed so that the buckling of any individual truss member is resisted internally by the individual truss through suitable means (i.e., buckling reinforcement by T-reinforcement or L-reinforcement). The buckling reinforcement of individual members of the trusses shall be installed as shown on the truss design drawing or on supplemental truss member buckling reinforcement details provided by the truss designer.

- ~~2. Permanent individual truss member restraint and diagonal bracing shall be installed using standard industry lateral restraint and diagonal bracing details in accordance with generally accepted engineering practice. Locations for lateral restraint shall be identified on the truss design drawing.~~
1. Permanent individual truss member restraint/bracing shall be installed using standard industry lateral restraint/bracing details in accordance with generally accepted engineering practice. Locations for lateral restraint shall be identified on the truss design drawing.
 2. The trusses shall be designed so that the buckling of any individual truss member is resisted internally by the individual truss through suitable means (i.e., buckling reinforcement by T-reinforcement or L-reinforcement), proprietary reinforcement, etc.) The buckling reinforcement of individual members of the trusses shall be installed as shown on the truss design drawing or on supplemental truss member buckling reinforcement details provided by the truss designer.
 3. A project specific permanent individual truss member restraint/bracing design shall be permitted to be specified by any registered design professional.

2303.4.1.3 Trusses spanning 60 feet or greater. The owner shall contract with any qualified registered design professional for the design of the temporary installation restraint/bracing and the permanent individual truss member restraint/bracing for all trusses with clear spans 60 feet (18 288 mm) or greater.

2303.4.1.3 2303.4.1.4 (Supp) Truss designer. The individual or organization responsible for the design of trusses.

2303.4.1.3.1 2303.4.1.4.1 (Supp) Truss design drawings. Where required by the registered design professional, the building official, or the statutes of the jurisdiction in which the project is to be constructed, each individual truss design drawing shall bear the seal and signature of the truss designer.

Exceptions:

1. Where a cover sheet and truss index sheet are combined into a single sheet and attached to the set of truss design drawings, the single cover/truss index sheet is the only document required to be signed and sealed by the truss designer.
2. When a cover sheet and a truss index sheet are separately provided and attached to the set of truss design drawings, the cover sheet and the truss index sheet are the only documents required to be signed and sealed by the truss designer.

2303.4.2 (Supp) Truss placement diagram. The truss manufacturer shall provide a truss placement diagram that identifies the proposed location for each individually designated truss and references the corresponding truss design drawing. The truss placement diagram shall be provided as part of the truss submittal package, and with the shipment of trusses delivered to the job site. Truss placement diagrams that serve only as a guide for installation and do not deviate from the permit submittal drawings shall not be required to bear the seal or signature of the truss designer.

Exception: ~~When the truss placement diagram is prepared under the direct supervision of a registered design professional, it is required to be signed and sealed.~~

2303.4.3 (Supp) Truss submittal package. The truss submittal package provided by the truss manufacturer shall consist of each individual truss design drawing, the truss placement diagram, the permanent individual truss member permanent restraint/bracing method and details and, any other structural details germane to the trusses; as applicable, the cover/truss index sheet.

2303.4.4 (Supp) Anchorage. The design for the transfer of loads and anchorage of each truss to the supporting structure is the responsibility of the registered design professional.

2303.4.5 (Supp) Alterations to trusses. Truss members and components shall not be cut, notched, drilled, spliced or otherwise altered in any way without written concurrence and approval of a registered design professional. Alterations resulting in the addition of loads to any member (e.g., HVAC equipment, pipng, additional roofing or insulation, etc. water heater) shall not be permitted without verification that the truss is capable of supporting such additional loading.

2303.4.6 (Supp) ~~Metal-plate-connected trusses~~ TPI 1 Specifications. In addition to Sections 2303.4.1 through 2303.4.5, the design, manufacture and quality assurance of metal-plate-connected wood trusses shall be in accordance with TPI 1. Job-site inspections shall be in compliance with Section 109.4 as applicable.

2303.4.7 Truss quality assurance. Trusses not part of a manufacturing process in accordance with Section 2303.4.6 or in accordance with a standard listed in Chapter 35, which provides requirements for quality control done under the supervision of a third party quality control agency, shall be manufactured in compliance with Section 1704.2 and 1704.6 as applicable.

Reason: This section has been modified to replicate the requirements of the Chapter 35 referenced standard ANSI/TPI 1–2007, National Design Standard for Metal Plate Connected Wood Trusses.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Modified

Modify proposal as follows:

2303.4.1.1 (Supp)Truss design drawings. The written, graphic and pictorial depiction of each individual truss shall be provided to the building official for approval prior to installation. Truss design drawings shall also be provided with the shipment of trusses delivered to the job site. Truss design drawings shall include, at a minimum, the information specified below:

1. Slope or depth, span and spacing;
2. Location of all joints and support locations;
3. Number of plies if greater than one;
4. Required bearing widths;
5. Design loads as applicable, including;
 - 5.1. Top chord live load ~~(for roof trusses, this shall be the controlling case of live load or snow load~~
 - 5.2. Top chord dead load;
 - 5.3. Bottom chord live load;
 - 5.4. Bottom chord dead load;
 - 5.5. Additional loads and locations
 - 5.6. Environmental design criteria and loads (wind, rain, snow, seismic, etc.)
6. Other lateral loads, including drag strut loads.
7. Adjustments to wood member and metal connector plate design value for conditions of use;
8. Maximum reaction force and direction, including maximum uplift reaction forces where applicable;
9. Metal connector plate type, size, and thickness or gage, and the dimensioned location of each metal connector plate except where symmetrically located relative to the joint interface;
10. Size, species and grade for each wood member;
11. Truss-to-truss connections and truss field assembly requirements
12. Calculated span to deflection ratio and maximum vertical and horizontal deflection for live and total load as applicable;
13. Maximum axial tension and compression forces in the truss members; and
14. Required permanent individual truss member restraint location and the method and details of restraint/bracing to be used per Section 2303.4.1.2.

(Portions of proposal not shown remain unchanged)

Committee Reason: This code change reformats and rewords the current wood truss design requirements and is largely editorial. This will benefit enforcement. The modifications clarify the required information regarding environmental loads.

Assembly Action:

None

Final Hearing Results

S216-07/08

AM

Code Change No: **S217-07/08**

Original Proposal

Section: 2303.4.2

Proponent: Edwin Huston, National Council of Structural Engineers Associations (NCSEA), representing NCSEA Code Advisory Committee – General Engineering Subcommittee

Revise as follows:

2303.4.2 (Supp) Truss placement diagram. The truss manufacturer shall provide a truss placement diagram that identifies the proposed location for each individually designated truss and references the corresponding truss design drawing. The truss placement diagram shall be provided as part of the truss submittal package, and with the shipment of trusses delivered to the job site. Truss placement diagrams shall not be required to bear the seal or signature of the truss designer.

~~**Exception:** When the truss placement diagram is prepared under the direct supervision of a registered design professional, it is required to be signed and sealed.~~

Reason: The truss placement diagram is an erection diagram that replicates the information on the approved construction documents per Section 106.3. As it requires no engineering input, direct supervision and the signature and seal of a registered design professional is not required.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: This proposal removes an unnecessary code provision and it is consistent with the prior action associated with wood truss design requirements.

Assembly Action:

None

Final Hearing Results

S217-07/08

AS

Code Change No: **S218-07/08**

Original Proposal

Section: 2304.9.5.1

Proponent: R. Scott Douglas, DCI Engineers, representing himself

Revise as follows:

2304.9.5.1 (Supp) Fasteners for preservative-treated wood. Fasteners for preservative-treated wood shall be of hot-dipped zinc-coated galvanized steel, stainless steel, silicon bronze or copper. Fasteners other than nails, and timber rivets, wood screws and lag screws shall be permitted to be of mechanically deposited zinc-coated steel with coating weights in accordance with ASTM B 695, Class 55 minimum.

Exception: Fasteners in SBX/DOT and zinc borate preservative-treated wood in an interior, dry environment need not be hot dipped galvanized.

Fastenings for wood foundations shall be as required in AF&PA Technical Report No. 7.

Reason: There is no documented evidence of any detrimental fastener corrosion when plain steel fasteners are used in SBX/DOT or zinc borate preservative treated wood in interior, dry environments; particularly when compared to other preservative wood treatments in identical environments. Tests by Simpson Strong-Tie have verified this field performance.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Modified

Modify proposal as follows:

2304.9.5.1 (Supp) Fasteners for preservative-treated wood. Fasteners for preservative-treated wood shall be of hot-dipped zinc-coated galvanized steel, stainless steel, silicon bronze or copper. Fasteners other than nails, and timber rivets, wood screws and lag screws shall be permitted to be of mechanically deposited zinc-coated steel with coating weights in accordance with ASTM B 695, Class 55 minimum.

Exception: Plain carbon steel fasteners in SBX/DOT and zinc borate preservative-treated wood in an interior, dry environment shall be permitted need not be hot dipped galvanized.

Committee Reason: This proposal allows an additional option for fasteners in limited locations. The modification rewords the exception to better state the proponent's intent.

Assembly Action:

None

Final Hearing Results

S218-07/08

AM

Code Change No: S219-07/08

Original Proposal

Sections: 2304.9.5, 2304.9.5.5 (New); IRC R319.3, R319.3.5 (New)

Proponent: Greg Greenlee, PE, USP Structural Connectors, representing himself

THESE PROPOSALS ARE ON THE AGENDA OF THE IBC STRUCTURAL AND THE IRC BUILDING/ENERGY CODE DEVELOPMENT COMMITTEES AS 2 SEPARATE CODE CHANGES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IBC STRUCTURAL

Revise as follows:

2304.9.5 (Supp) Fasteners and connectors in contact with preservative-treated and fire-retardant-treated wood. Fasteners and connectors for in contact with preservative treated and fire-retardant-treated wood shall be in accordance with Sections 2304.9.5.1 through 2304.9.5.4. The coating weights for zinc-coated fasteners shall be in accordance with ASTM A 153. Connectors in contact with preservative-treated wood that are used in exterior applications shall be in accordance to the manufacturer's recommendations. In the absence of manufacturer's recommendation a minimum of ASTM A 653 type G185 zinc-coated galvanized steel, or equivalent, shall be used.

2304.9.5.1 (Supp) Fasteners for preservative-treated wood. Fasteners for preservative-treated wood shall be of hot-dipped zinc-coated galvanized steel, stainless steel, silicon bronze or copper. Fasteners other than nails, timber rivets, wood screws and lag screws shall be permitted to be of mechanically deposited zinc-coated steel with coating weights in accordance with ASTM B 695, Class 55 minimum.

2304.9.5.2 (Supp) Fastenings for wood foundations. Fastenings for wood foundations shall be as required in AF&PA Technical Report No. 7.

2304.9.5.3 (Supp) Fasteners for fire-retardant-treated wood used in exterior applications or wet or damp locations. Fasteners for fire-retardant-treated wood used in exterior applications or wet or damp locations shall be of hot-dipped zinc-coated galvanized steel, stainless steel, silicon bronze or copper. Fasteners other than nails, timber rivets, wood screws and lag screws shall be permitted to be of mechanically deposited zinc coated steel with coating weights in accordance with ASTM B 695, Class 55 minimum.

2304.9.5.4 (Supp) Fasteners for fire-retardant-treated wood used in interior applications. Fasteners for fire-retardant treated wood used in interior locations shall be in accordance with the manufacturer's recommendations. In the absence of manufacturer's recommendations, Section 2304.9.5.3 shall apply.

2304.9.5.5 Fasteners and connectors subject to exposure and located within 300 feet of the shoreline. Fasteners and connectors used in exterior applications that are located within 300 feet (91440 mm) of the shoreline shall be stainless steel grade 304 or 316 or an approved alternative.

PART II – IRC BUILDING/ENERGY

Revise as follows:

R319.3 (Supp) Fasteners and connectors in contact with preservative-treated and fire-retardant-treated wood. Fasteners and connectors in contact with preservative-treated wood and fire-retardant-treated wood shall be in accordance with this section. The coating weights for zinc-coated fasteners shall be in accordance with ASTM A 153.

Connectors in contact with preservative-treated wood that are used in exterior applications shall be in accordance to the manufacturer's recommendations. In the absence of manufacturer's recommendation a minimum of ASTM A 653 type G185 zinc-coated galvanized steel, or equivalent, shall be used.

R319.3.1 (Supp) Fasteners for preservative treated wood. Fasteners for preservative-treated wood shall be of hot dipped zinc-coated galvanized steel, stainless steel, silicon bronze or copper.

Exceptions:

1. One-half-inch (12.7 mm) diameter or greater steel bolts.
2. Fasteners other than nails, timber rivets, wood screws and lag screws shall be permitted to be of mechanically deposited zinc coated steel with coating weights in accordance with ASTM B 695, Class 55 minimum.

R319.3.2 (Supp) Fastenings for wood foundations. Fastenings for wood foundations shall be as required in AF&PA Technical Report No. 7.

R319.3.3 (Supp) Fasteners for fire-retardant-treated wood used in exterior applications or wet or damp locations. Fasteners for fire-retardant-treated wood used in exterior applications or wet or damp locations shall be of hot dipped zinc-coated galvanized steel, stainless steel, silicon bronze or copper.

R319.3.4 (Supp) Fasteners for fire-retardant-treated wood used in interior applications. Fasteners for fire-retardant treated wood used in interior locations shall be in accordance with the manufacturer's recommendations. In the absence of the manufacturer's recommendations, Section R319.3.3 shall apply.

R319.3.5 Fasteners and connectors subject to exposure and located within 300 feet of the shoreline. Fasteners and connectors used in exterior application that are located within 300 feet (91440mm) of the shoreline shall be stainless steel grade 304 or 316 or an approved alternative.

Reason: The added language in this proposal will accomplish two things. First, it will clarify the minimum coating requirements for connectors used in exterior applications and in contact with preservative treated wood. Currently connector manufacturers are recommending at a minimum a G185 coating for connectors in contact with preservative treated wood in exterior applications. This recommendation is based on accelerated corrosion testing conducted by USP Structural Connectors and others in the industry. Second, it will add specific requirements for connectors and fasteners in coastal areas. Both of these items were proposed during the last code cycle, but needed to be coordinated further with the proponents. As stated in the last code cycle, the extra hazard to fasteners and connectors installed in an environment of regular exposure to salt spray has been seen to promote their premature failure leading to the collapse of the decks constructed with currently code compliant fasteners and connectors. By requiring grade 304 or 316 stainless steel or an equivalent approved by the building official the usable expectant life of these fasteners and connectors will be extended to equal those installed in less hazardous environments.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing Results

**PART I – IBC STRUCTURAL
Committee Action:**

Disapproved

Committee Reason: The committee does not feel that this proposal is ready for the code. There was a particular concern over the appropriate relationship between a manufacturer's recommendations and the referenced ASTM standard.

Assembly Action:

None

**PART II – IRC B/E
Committee Action:**

Approved as Modified

Modify the proposal as follows:

R319.3 (Supp) Fasteners and connectors in contact with preservative-treated and fire-retardant-treated wood. Fasteners and connectors in contact with preservative-treated wood and fire-retardant-treated wood shall be in accordance with this section. The coating weights for zinc-coated fasteners shall be in accordance with ASTM A 153.

R319.3.1 (Supp) Fasteners for preservative treated wood. Fasteners for preservative-treated wood shall be of hot dipped zinc-coated galvanized steel, stainless steel, silicon bronze or copper. Coating types and weights for connectors in contact with preservative-treated wood ~~that are used in exterior applications~~ shall be in accordance with the connector manufacturer's recommendations. In the absence of manufacturer's recommendations a minimum of ASTM A 653 type G185 zinc-coated galvanized steel, or equivalent, shall be used.

Exceptions:

1. One-half-inch (12.7 mm) diameter or greater steel bolts.
2. Fasteners other than nails, timber rivets, wood screws and lag screws shall be permitted to be of mechanically deposited zinc coated steel with coating weights in accordance with ASTM B 695, Class 55 minimum.

R319.3.2 (Supp) Fastenings for wood foundations. Fastenings for wood foundations shall be as required in AF&PA Technical Report No. 7.

R319.3.3 (Supp) Fasteners for fire-retardant-treated wood used in exterior applications or wet or damp locations. Fasteners for fire-retardant-treated wood used in exterior applications or wet or damp locations shall be of hot dipped zinc-coated galvanized steel, stainless steel, silicon bronze or copper.

R319.3.4 (Supp) Fasteners for fire-retardant-treated wood used in interior applications. Fasteners for fire-retardant treated wood used in interior locations shall be in accordance with the manufacturer's recommendations. In the absence of the manufacturer's recommendations, Section R319.3.3 shall apply.

~~**R319.3.5 Fasteners and connectors subject to exposure and located within 300 feet of the shoreline.** Fasteners and connectors used in exterior application that are located within 300 feet (91440mm) of the shoreline shall be stainless steel grade 304 or 316 or an approved alternative.~~

Committee Reason: The proposal as modified serves to clarify the minimum coating requirements for fasteners and connectors in contact with preservative treated wood. By requiring the proper coating for fasteners and connectors the usable expectant life will be extended. The committee felt the modification was necessary to eliminate the restrictive language that specifically addressed fasteners and connectors used in exterior locations and subject to exposure within 300 feet of a shoreline as it was too restrictive.

Assembly Action:

None

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Greg Greenlee, PE, USP Structural Connectors, requests Approval as Modified by this Public Comment for Part I.

Modify proposal as follows:

2304.9.5 (Supp) Fasteners and connectors in contact with preservative-treated and fire-retardant-treated wood. Fasteners and connectors in contact with preservative treated and fire-retardant-treated wood shall be in accordance with Sections 2304.9.5.1 through 2304.9.5.4. The coating weights for zinc-coated fasteners shall be in accordance with ASTM A 153. ~~Connectors in contact with preservative-treated wood that are used in exterior applications shall be in accordance to the manufacturer's recommendations. In the absence of manufacturer's recommendation a minimum of ASTM A 653 type G185 zinc-coated galvanized steel, or equivalent, shall be used.~~

2304.9.5.1 (Supp) Fasteners and connectors for preservative-treated wood. Fasteners ~~for~~ in contact with preservative-treated wood shall be of hot-dipped zinc-coated galvanized steel, stainless steel, silicon bronze or copper. Fasteners other than nails, timber rivets, wood screws and lag screws shall be permitted to be of mechanically deposited zinc-coated steel with coating weights in accordance with ASTM B 695, Class 55 minimum. Connectors that are used in exterior applications and in contact with preservative treated wood shall have coating types and weights in accordance with the treated wood or connector manufacturer's recommendations. In the absence of manufacturer's recommendation a minimum of ASTM A 653 type G185 zinc-coated galvanized steel, or equivalent, shall be used.

2304.9.5.2 (Supp) Fastenings for wood foundations. Fastenings for wood foundations shall be as required in AF&PA Technical Report No. 7.

2304.9.5.3 (Supp) Fasteners for fire-retardant-treated wood used in exterior applications or wet or damp locations. Fasteners for fire-retardant-treated wood used in exterior applications or wet or damp locations shall be of hot-dipped zinc-coated galvanized steel, stainless steel, silicon bronze or copper. Fasteners other than nails, timber rivets, wood screws and lag screws shall be permitted to be of mechanically deposited zinc coated steel with coating weights in accordance with ASTM B 695, Class 55 minimum.

2304.9.5.4 (Supp) Fasteners for fire-retardant-treated wood used in interior applications. Fasteners for fire-retardant treated wood used in interior locations shall be in accordance with the manufacturer's recommendations. In the absence of manufacturer's recommendations, Section 2304.9.5.3 shall apply.

~~**2304.9.5.5 Fasteners and connectors subject to exposure and located within 300 feet of the shoreline.** Fasteners and connectors used in exterior applications that are located within 300 feet (91440 mm) of the shoreline shall be stainless steel grade 304 or 316 or an approved alternative.~~

Commenter's Reason: At the hearings in Palm Springs this modification was disapproved because of the numerous floor modifications proposed. This public comment addresses the concerns of interested parties and includes their suggested modifications into a single public comment. The changes themselves add needed language to the code to clarify the minimum coating requirements for connectors used in exterior applications. Currently connector manufacturers are recommending at a minimum a G185 coating for connectors in contact with preservative treated wood in exterior applications. This public comment also includes some minor editorial changes to clarify the intent of the original submittal. Finally, this proposal is necessary to make the IBC language coordinate with the IRC language approved at the hearings in Palm Springs.

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Greg Greenlee, PE, USP Structural Connectors, requests Approval as Modified by this Public Comment for Part II.

Further modify proposal as follows:

R319.3 (Supp) Fasteners and connectors in contact with preservative-treated and fire-retardant-treated wood. Fasteners and connectors in contact with preservative-treated wood and fire-retardant-treated wood shall be in accordance with this section. The coating weights for zinc-coated fasteners shall be in accordance with ASTM A 153.

R319.3.1 (Supp) Fasteners and connectors for preservative treated wood. Fasteners ~~in contact with~~ for preservative-treated wood shall be of hot dipped zinc-coated galvanized steel, stainless steel, silicon bronze or copper. ~~Coating types and weights for connectors~~ Connectors that are used in exterior applications and in contact with preservative-treated wood shall have coating types and weights ~~be~~ in accordance with the treated wood or connector manufacturer's recommendations. In the absence of manufacturer's recommendations a minimum of ASTM A 653 type G185 zinc-coated galvanized steel, or equivalent, shall be used.

Exceptions:

1. One-half-inch (12.7 mm) diameter or greater steel bolts.
2. Fasteners other than nails, timber rivets, wood screws and lag screws shall be permitted to be of mechanically deposited zinc coated steel with coating weights in accordance with ASTM B 695, Class 55 minimum.

R319.3.2 (Supp) Fastenings for wood foundations. Fastenings for wood foundations shall be as required in AF&PA Technical Report No. 7.

R319.3.3 (Supp) Fasteners for fire-retardant-treated wood used in exterior applications or wet or damp locations. Fasteners for fire-retardant-treated wood used in exterior applications or wet or damp locations shall be of hot dipped zinc-coated galvanized steel, stainless steel, silicon bronze or copper.

R319.3.4 (Supp) Fasteners for fire-retardant-treated wood used in interior applications. Fasteners for fire-retardant treated wood used in interior locations shall be in accordance with the manufacturer's recommendations. In the absence of the manufacturer's recommendations, Section R319.3.3 shall apply.

Commenter's Reason: The public comments include minor clarification and editorial changes to the floor modification approved at the hearings in Palm Springs.

Final Hearing Results

**S219-07/08, Part I
S219-07/08, Part II**

**AMPC
AMPC**

Code Change No: S221-07/08

Original Proposal

Sections: 2304.11.2.1, 2308.10.1

Proponent: Philip Brazil, PE, SE, Reid Middleton, Inc., representing himself

Revise as follows:

2304.11.2.1 Joists, girders and subfloor. Where wood joists or the bottom of a wood structural floor without joists are closer than 18 inches (457 mm), or wood girders are closer than 12 inches (305 mm) to the exposed ground in crawl spaces or unexcavated areas located within the perimeter of the building foundation, the floor ~~assembly construction~~ (including posts, girders, joists and subfloor) shall be of naturally durable or preservative-treated wood.

2308.10.1 Wind uplift. ~~The roof assemblies construction~~ shall have rafter and truss ties to the wall below. Resultant uplift loads shall be transferred to the foundation using a continuous load path. The rafter or truss to wall connection shall comply with Tables 2304.9.1 and 2308.10.1.

Reason: The changes are proposed to avoid potential conflicts with the use of "floor assembly" and "roof assembly" elsewhere in the 2006 IBC. These terms are used extensively in the fire safety provisions in conjunction with the fire resistance of assemblies incorporating floors and roofs (i.e., horizontal assemblies). "Roof assembly" is also defined in Chapter 15 and is used extensively with those provisions. The sections above contain the only instances of "floor assembly(ies)" and "roof assembly(ies)" in the structural chapters of the 2006 IBC.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The reference to floor or roof construction is a more succinct statement that is preferable to using the term "assembly".

Assembly Action:

None

Final Hearing Results

S221-07/08

AS

Code Change No: S222-07/08

Original Proposal

Table 2306.3.2

Proponent: Edward L. Keith, APA – the Engineered Wood Association

Add figure to table as follows:

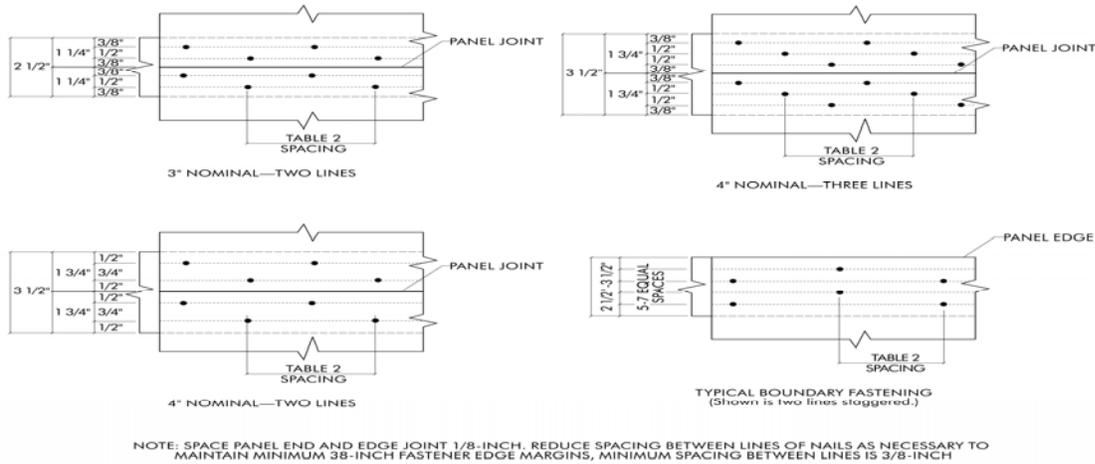
TABLE 2306.3.2
ALLOWABLE SHEAR (POUNDS PER FOOT) FOR WOOD STRUCTURAL PANEL BLOCKED DIAPHRAGMS
UTILIZING MULTIPLE ROWS OF FASTENERS (HIGH LOAD DIAPHRAGMS) WITH FRAMING OF
DOUGLAS FIR-LARCH OR SOUTHERN PINE ^a FOR WIND OR SEISMIC LOADING ^{b, g, h}

(Portions of table not shown remain unchanged)

CODE CHANGES RESOURCE COLLECTION – INTERNATIONAL BUILDING CODE

Reason: The purpose is to clarify the code.

When the table was added to the IBC, the figures at the bottom of the table were inadvertently left out. The figures give diagrams of the various multi-row nail applications showing required spacing and staggering. These construction details provide clarity to the table and are essential to develop the values listed in the table. These figures have been part of this table for over two decades.



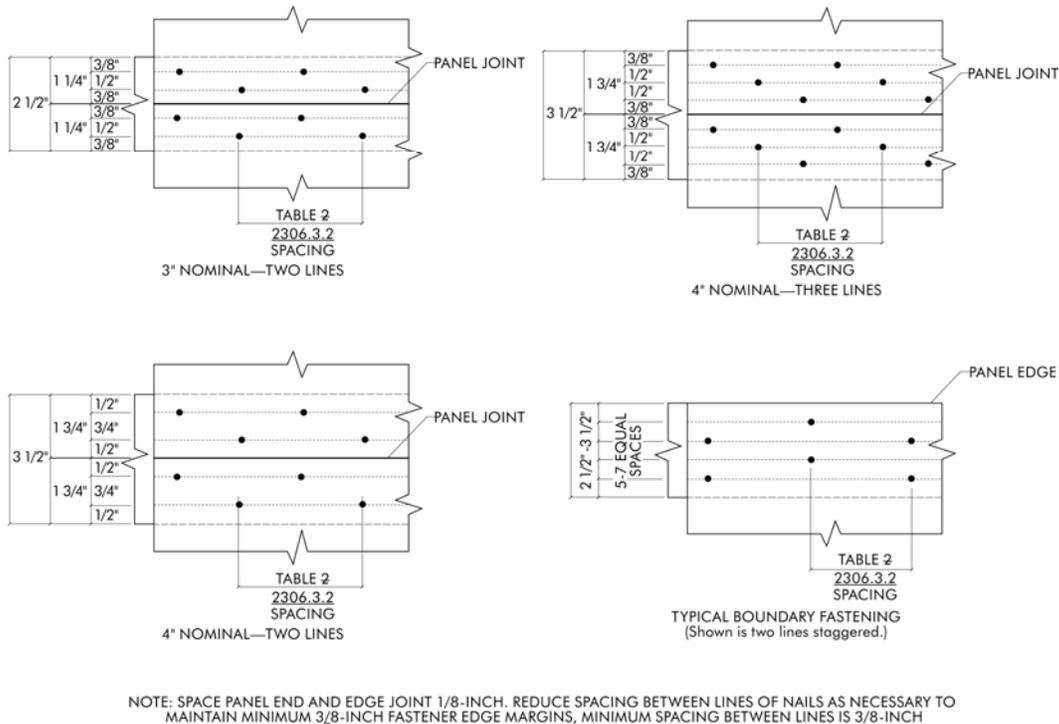
Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Modified

Modify proposal as follows:



Committee Reason: This proposal clarifies the code by adding an illustration of nail spacing and staggering to the diaphragm load table. The modification corrects typos in the figure submitted with the code change.

Assembly Action:

None

Final Hearing Results

S222-07/08

AM

Code Change No: S224-07/08

Original Proposal

Section: 2308.3.2

Proponent: James E. Russell, Building Codes Consultant, representing himself.

Revise as follows:

2308.3.2 Braced wall line panel connections. Wind and seismic lateral forces shall be transferred from the roofs and floors to braced wall lines panels and from the braced wall lines panels in upper stories to the braced wall lines panels in the story below by the following:

1. ~~Braced wall line panel top and bottom plates shall be fastened to joists, rafters or full-depth blocking above in accordance with Table 2304.9.1 items 11, 12, 15 or 19 as applicable based on the orientation of the joists or rafters to the braced wall line. Braced wall line bottom plates shall be connected to joists or blocking below in accordance with Table 2304.9.1 item number 6, or to foundations in accordance with Section 2308.3.3. At exterior gable end walls b~~Braced wall panels sheathing in the top story shall be extended and fastened to roof framing ~~at intervals not to exceed where the spacing between parallel exterior braced wall lines is greater than 50 feet (15240 mm) between parallel braced wall lines.~~

Exception: Where roof trusses are used and are installed perpendicular to an exterior braced wall line, lateral forces shall be transferred from the roof diaphragm to the braced wall by blocking of the ends of the trusses or by other approved methods providing equivalent lateral force transfer. Blocking shall be minimum 2 inch (51 mm) nominal thickness and equal to the depth of the truss at the wall line and shall be fastened to the braced wall line top plate as specified in Table 2304.9.1 item number 11.

2. ~~Bottom plate fastening to joist or blocking below shall be with not less than 3-16d nails at 16 inches (406 mm) o.c.~~
3. ~~Blocking shall be nailed to the top plate below with not less than 3-8d toenails per block~~
4. ~~Joists parallel to the top plate shall be nailed to the top plate with not less than 8d toenails at 6 inches (152 mm) o.c.~~

~~In addition, top plate laps shall be nailed with not less than 8-16d face nails on each side of each break in the top plate.~~

Reason: The purpose of this code change is to improve the understanding of current code section 2308.3.2 regarding connections required along braced wall lines, and to eliminate redundant information specified elsewhere in the code, by:

1. Editorially clarifying in the first paragraph that the "forces" to be transferred are "wind and seismic lateral" forces.
2. Clarifying in the first paragraph and in current item number 1, that Section 2308.3.2 applies to braced wall *lines*, instead of only to the braced wall *panel* portion of a braced wall line. For example, the connection between blocking or floor framing and a braced wall line top plate does not occur ONLY at the braced wall panel location, nor does the connection of the wall bottom plate to the foundation occur ONLY at the braced wall panel location. The connections between top plate and other framing above that are currently specified in items number 3 and 4 of Section 2308.3.2 are applicable to the entire length of a braced wall line, not just at braced wall panels, because those connections are identically specified in Table 2304.9.1. The term braced wall *panel* would only be correct IF the section was specifying special or additional connections at the braced wall panel portion of a wall, however, the current section does not specify any connections that are different or in addition to those already in the code.

3. Adding new wording in current item number 1 to identify where each of the required connections is already specified in the code. This better informs the code user regarding where to locate the specifics for each connection being considered in this section.
4. Modifying the wording in the final sentence of current item number 1 to apply only to exterior gable end walls, because that is the only location where braced wall panels can be practically extended and attached to the roof framing. Also the phrase “*braced wall panel shall be extended*” is clarified to state “braced wall panel *sheathing in the top story* shall be extended” to provide a clearer description of what is to be done. When rafters (or trusses) are perpendicular to a exterior braced wall line there is no practical method of “extending and attaching” the wall panel (or panel sheathing) to roof framing oriented at 90 degrees to the wall direction. When rafters and ceiling joists are perpendicular to a braced wall line, conventional construction has traditionally relied on the connections specified in items number 11, 15 and 19 of Table 2304.9.1 to provide a load path to transfer wind and seismic lateral forces. ALSO, at interior braced wall lines, there has never been a conventional construction provision in the legacy codes or the IRC that specifies extending *interior* braced wall line panels above the top plate to attach to roof framing (rafter/ceiling joist system, or a truss). Further, the maximum spacing of parallel braced wall lines is 35 feet (Sec. 2308.3), therefore a distance of 50 feet between parallel braced wall lines can only occur when the interior braced wall line spacing is ignored.
5. Clarifying the exception by adding the words “*and are installed perpendicular to an exterior braced wall line*” to identify the orientation of trusses to the braced wall where the blocking at the ends of the trusses would occur. Roof trusses installed parallel to a braced wall is not a configuration that was envisioned by the current section’s wording “*blocking of the ends of trusses*”. For example, where trusses are oriented parallel to, but NOT directly above a braced wall line, blocking providing a lateral load path from the roof to the braced wall would not be provided at truss ends. Instead multiple blocks would occur perpendicular to the truss bottom chord at some specific interval measured along the braced wall line.
6. Modifying the end of the first sentence of the exception to include the words “*providing equivalent lateral force transfer*” provides the building official with a basis for judging the acceptability of a method other than blocking between ends of trusses. This also informs truss manufactures regarding what will be considered when approving methods other than blocking.
7. Adding a sentence at the end of the exception to specify the required minimum blocking size and the connection of the blocking to the braced wall top plate, because that information is currently not specified in the exception.
8. Deletion of the redundant connection information in existing items 2, 3, and 4, and in the existing final paragraph, because all of that information is currently identically specified in Table 2304.9.1 or Section 2308.9.2.1.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: This is a needed clarification of the connection requirements along braced wall lines.

Assembly Action:

None

Final Hearing Results

S224-07/08

AS

Code Change No: S227-07/08

Original Proposal

Section: 2308.9.1; IRC R602.3

Proponent: Robert Rice, Josephine County, OR, representing Josephine County Building Safety and Southern Oregon Chapter International Code Council.

THESE PROPOSALS ARE ON THE AGENDA OF THE IBC STRUCTURAL AND THE IRC BUILDING/ENERGY CODE DEVELOPMENT COMMITTEES AS 2 SEPARATE CODE CHANGES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IBC STRUCTURAL

Revise as follows:

2308.9.1 Size, height and spacing. The size, height and spacing of studs shall be in accordance with Table 2308.9.1 except that utility-grade studs shall not be spaced more than 16 inches (406 mm) o.c., or support more than a roof and ceiling, or exceed 8 feet (2438 mm) in height for exterior walls and load-bearing walls or 10 feet (3048 mm) for interior nonload-bearing walls. Studs shall be continuous from a support at the bottom to a support at the top to resist loads perpendicular to wall. The support shall be a foundation or floor, ceiling or roof diaphragm or shall be designed in accordance with accepted engineering practice.

PART II – IRC BUILDING/ENERGY

Revise as follows:

R602.3 Design and construction. Exterior walls of wood-frame construction shall be designed and constructed in accordance with the provisions of this chapter and Figures R602.3(1) and R602.3(2) or in accordance with AF&PA's NDS. Components of exterior walls shall be fastened in accordance with Tables R602.3(1) through R602.3(4). Exterior walls covered with foam plastic sheathing shall be braced in accordance with Section R602.10. Structural sheathing shall be fastened directly to structural framing members.

Studs shall be continuous from a support at the bottom to a support at the top to resist loads perpendicular to wall. The support shall be a foundation or floor, ceiling or roof diaphragm or shall be designed in accordance with accepted engineering practice.

Reason: *The prescriptive provisions of the IBC intentionally parallel the prescriptive provisions of the IRC.* The prescriptive provisions of the IRC are based on platform or balloon framing as stated in section, "**R301.1.2 Construction Systems**. The requirements of this code are based on platform and balloon-frame construction....."

With platform or balloon framing, the walls are supported at top and bottom to resist wind or seismic loads that are applied to the face of the wall ("out of plane loads"). The bottom is fastened to the floor system (diaphragm) or directly to the foundation. The top of the wall is supported by ceiling or roof diaphragms. The diaphragm is the ceiling or roof sheathing and defined in the code as

IBC: "A horizontal or sloped system acting to transmit lateral forces to the vertical resisting elements. When the term "diaphragm" is used, it includes horizontal bracing systems."

IRC: "A horizontal or nearly horizontal system acting to transmit lateral forces to the vertical resisting elements. When the term "diaphragm" is used, it includes horizontal bracing systems."

In the common condition where vaulted trusses are used, the gable end truss should be vaulted as well and the wall should be framed up to the bottom of the vaulted truss. Another option would be to not install a truss at the end-wall and frame the exterior wall up to the roof sheathing (i.e. "Balloon Framed"). In either case, the studs are supported at top and bottom.

This is consistent with BCSI 1-03, "**Guide to good practice for handling, installing & bracing of metal plate connected wood trusses**", by the Wood Truss Council of America and the Truss Plate Institute, October 1, 2003 which states,

"Important Note: Scissor truss applications must not be framed with flat bottom chord gable end frames as this creates a hinge in the wall/gable interface that is below the bottom chord plane diaphragm. Adequate bracing of this condition is difficult and sometimes impossible."

An article in the December 2004 Building Safety Journal, by Gregg Shea, P.E., Ted Osterberger, P.E. and Frank E Woeste, PhD, P.E. titled "Evaluating Tall Residential Walls for Code Conformance" addresses the issue of tall gable end walls. The article speaks in detail about the condition that my proposal addresses. In the article they state,

"DON'T create a hinge with stacked framing. The use of platform framing without a diaphragm for support results in a hinge at the center"
"Hinges in tall walls caused by inappropriate platform framing, lack of continuous vertical members or a gable end truss profile different from the adjacent roof trusses create structural instabilities."

In summary, if the wall is not supported at the top by a ceiling or roof diaphragm it is not prescriptive and an engineered design should be provided describing adequate support through multiple top plates, horizontal beam at top of wall, perpendicular interior walls, or other approved methods to resist out-of-plane lateral loads.

Bibliography:

BCSI 1-03, "**Guide to good practice for handling, installing & bracing of metal plate connected wood trusses**", by the Wood Truss Council of America and the Truss Plate Institute, October 1, 2003

Evaluating Tall Residential Walls for Code Conformance, December 2004 *Building Safety Journal*, by Gregg Shea, P.E., Ted Osterberger, P.E. and Frank E Woeste, PhD, P.E.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

PART I – IBC STRUCTURAL

Committee Action:**Approved as Modified****Modify proposal as follows:**

2308.9.1 Size, height and spacing. The size, height and spacing of studs shall be in accordance with Table 2308.9.1 except that utility-grade studs shall not be spaced more than 16 inches (406 mm) o.c., or support more than a roof and ceiling, or exceed 8 feet (2438 mm) in height for exterior walls and load-bearing walls or 10 feet (3048 mm) for interior nonload-bearing walls. Studs shall be continuous from a support at the bottom to a support at the top to resist loads perpendicular to wall. The support shall be a foundation or floor, ceiling or roof diaphragm or shall be designed in accordance with accepted engineering practice.

Exception: Jack studs, trimmer studs and cripple studs at openings in walls that comply with Table 2308.9.5.

Committee Reason: This code change clarifies the intent of the code by requiring studs to be continuous which eliminates possible hinges in walls. The modification adds an appropriate exception which addresses conditions at wall openings.

Assembly Action:**None**

PART II – IRC B/E
Committee Action:

Disapproved

Committee Reason: This proposal would permit an unlimited height stud at maximum stud spacing from a floor to a three story ceiling. This would also permit stacking of panelized construction.

Assembly Action:

None

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Larry Wainwright, WTCA, representing the Structural Building Components Industry, requests Approval as Modified by this Public Comment for Part I.

Further modify proposal as follows:

2308.9.1 Size, height and spacing. The size, height and spacing of studs shall be in accordance with Table 2308.9.1 except that utility-grade studs shall not be spaced more than 16 inches (406 mm) o.c., or support more than a roof and ceiling, or exceed 8 feet (2438 mm) in height for exterior walls and load-bearing walls or 10 feet (3048 mm) for interior nonload-bearing walls. Studs shall be continuous from a support at the ~~bottom~~ sole plate to a support at the top plate to resist loads perpendicular to wall. The support shall be a foundation or floor, ceiling or roof diaphragm or shall be designed in accordance with accepted engineering practice.

Exception: Jack studs, trimmer studs and cripple studs at openings in walls that comply with Table 2308.9.5.

Commenter's Reason: This is an editorial change to more clearly communicate the intent of the proponent. The terms "top" and "bottom" are replaced with "sole plate" and "top plate", which are used in the referenced table 602.3(1).

This item is on the agenda for individual consideration because public comments were submitted.

Public Comment 1:

Robert Rice, Josephine County Building Safety, representing Josephine County and Southern Oregon Chapter of ICC, requests Approval as Modified by this Public Comment for Part II.

Modify proposal as follows:

R602.3 Design and construction. Exterior walls of wood-frame construction shall be designed and constructed in accordance with the provisions of this chapter and Figures R602.3(1) and R602.3(2) or in accordance with AF&PA's NDS. Components of exterior walls shall be fastened in accordance with Tables R602.3(1) through R602.3(4). Exterior walls covered with foam plastic sheathing shall be braced in accordance with Section R602.10. Structural sheathing shall be fastened directly to structural framing members.

Studs shall be continuous from a support at the bottom to a support at the top to resist loads perpendicular to wall. The support shall be a foundation or floor, ceiling or roof diaphragm or shall be designed in accordance with accepted engineering practice.

Exception: Jack studs, trimmer studs and cripple studs at openings in wall that comply with Tables R502.5(1) and R502.5(2).

Commenter's Reason: For reference, the IBC version of this proposal, S227-07/08 Part I, was approved by committee As Modified by the exception as shown for wall openings. The committee reason states, "This code change clarifies the intent of the code by requiring studs to be continuous which eliminates possible hinges in wall. The modification adds an appropriate exception which addresses conditions at wall openings."

At the IRC hearings a member of the committee asked two questions that were not able to be addressed at the microphone during Code Development Hearings due to timing. The committees reason states,

"This proposal would permit an unlimited height stud at maximum stud spacing from a floor to a three story ceiling. This would also permit stacking of panelized construction."

The two concerns raised by the committee member can be answered as follows;

1. Stud height and spacing is already defined and regulated in the IRC in Section R602.3.1 and Tables R602.3(5) and Table R602.3.1. I have included it in the proposal above for reference. This proposal does not change the limitations on height & spacing that are currently in the code.
2. Panelized construction, such as Structural Insulated Panels (SIPS), would be a designed system. This would certainly be true if the panels were stacked. This concern is already addressed in the proposal by the statement, "or shall be designed in accordance with accepted engineering practice."

I urge your support of this proposal.

Purpose

The prescriptive provisions of the IRC are based on platform or balloon framing as stated in section, "R301.1.2 Construction Systems. The requirements of this code are based on platform and balloon-frame construction....."

With platform or balloon framing, the walls are supported at top and bottom to resist wind or seismic loads that are applied to the face of the wall ("out of plane loads"). The bottom is fastened to the floor system (diaphragm) or directly to the foundation. The top of the wall is supported by ceiling or roof diaphragms. The diaphragm is the ceiling or roof sheathing and defined in the code as

"A horizontal or nearly horizontal system acting to transmit lateral forces to the vertical resisting elements. When the term "diaphragm" is used, it includes horizontal bracing systems."

In the common condition where vaulted trusses are used, the gable end truss should be vaulted as well and the wall should be framed up to the bottom of the vaulted truss. Another option would be to not install a truss at the endwall and frame the exterior wall up to the roof sheathing (i.e. "Balloon Framed"). In either case, the studs are supported at top and bottom.

This is consistent with BCSI 1-03, "Guide to good practice for handling, installing & bracing of metal plate connected wood trusses", by the Wood Truss Council of America and the Truss Plate Institute, October 1, 2003 which states,

"Important Note: Scissor truss applications must not be framed with flat bottom chord gable end frames as this creates a hinge in the wall/gable interface that is below the bottom chord plane diaphragm. Adequate bracing of this condition is difficult and sometimes impossible."

An article in the December 2004 Building Safety Journal, by Gregg Shea, P.E., Ted Osterberger, P.E. and Frank E Woeste, PhD, P.E. titled "Evaluating Tall Residential Walls for Code Conformance" addresses the issue of tall gable end walls. The article speaks in detail about the condition that my proposal addresses. In the article they state,

"DON'T create a hinge with stacked framing. The use of platform framing without a diaphragm for support results in a hinge at the center"

"Hinges in tall walls caused by inappropriate platform framing, lack of continuous vertical members or a gable end truss profile different from the adjacent roof trusses create structural instabilities.

In summary, if the wall is not supported at the top by a ceiling or roof diaphragm it is not prescriptive and an engineered design should be provided describing adequate support through multiple top plates, horizontal beam at top of wall, perpendicular interior walls, or other approved methods.

Bibliography

BCSI 1-03, "Guide to good practice for handling, installing & bracing of metal plate connected wood trusses", by the Wood Truss Council of America and the Truss Plate Institute, October 1, 2003

Evaluating Tall Residential Walls for Code Conformance, December 2004 Building Safety Journal, by Gregg Shea, P.E., Ted Osterberger, P.E. and Frank E Woeste, PhD, P.E.

Public Comment 2:

Larry Wainwright, WTCA, representing the Structural Building Components Industry, requests Approval as Modified by this Public Comment.

Modify proposal as follows:

R602.3 Design and construction. Exterior walls of wood-frame construction shall be designed and constructed in accordance with the provisions of this chapter and Figures R602.3(1) and R602.3(2) or in accordance with AF&PA's NDS. Components of exterior walls shall be fastened in accordance with Tables R602.3(1) through R602.3(4). Exterior walls covered with foam plastic sheathing shall be braced in accordance with Section R602.10. Structural sheathing shall be fastened directly to structural framing members.

Studs shall be continuous from a support at the ~~bottom~~ sole plate to a support at the top plate to resist loads perpendicular to wall. The support shall be a foundation or floor, ceiling or roof diaphragm or shall be designed in accordance with accepted engineering practice.

Commenter's Reason: To maintain consistency, the terms "top" and "bottom" are replaced with "sole plate" and "top plate", which are used in the referenced table 602.3(1).

Final Hearing Results

S227-07/08, Part I	AMPC
S227-07/08, Part II	AMPC1, 2

Code Change No: **S229-07/08**

Original Proposal

Section: 2308.11.2

Proponent: Jim W. Sealy, FAIA, and Kelly Cobeen, Building Seismic Safety Council of the National Institute of Building Sciences, representing FEMA/BSSC Code Resource Support Committee

Revise as follows:

2308.11.2 (Supp) Concrete or masonry. Concrete or masonry walls and stone or masonry veneer shall not extend above the basement.

Exceptions:

1. Stone and masonry veneer is permitted to be used in the first two stories above grade plane or the first three stories above grade plane where the lowest story has concrete or masonry walls in Seismic Design Category B, provided that structural use panel wall bracing is used and the length of bracing provided is one- and one half times the required length as determined in Table 2308.9.3(1).
2. Stone and masonry veneer is permitted to be used in the first story above grade plane or the first two stories above grade plane where the lowest story has concrete or masonry walls in Seismic Design Category B or C.
3. Stone and masonry veneer is permitted to be used in both stories of buildings with the first two stories above grade plane in Seismic Design Categories B and C, provided the following criteria are met:
 - 3.1. Type of brace per Section 2308.9.3 shall be Method 3 and the allowable shear capacity in accordance with Table 2306.4.1 shall be a minimum of 350 plf (5108 N/m).
 - 3.2. The bracing of the top story shall be located at each end and at least every 25 feet (7620 mm) o.c. but not less than 40 percent of the braced wall line. The bracing of the first story shall be located at each end and at least every 25 feet (7620 mm) o.c. but not less than 35 percent of the braced wall line. Braced wall panels in the second story shall be located in accordance with Section 2308.9.3 and not more than 25 feet (7620 mm) on center, and the total length of braced wall panels shall be not less than 25% of the braced wall line length. Braced wall panels in the first story shall be located in accordance with Section 2308.9.3 and not more than 25 feet (7620 mm) on center, and the total length of braced wall panels shall be not less than 45% of the braced wall line length.
 - 3.3. Hold-down connectors shall be provided at the ends of each braced walls panel for the second story floor-to first story connection floor-wall assembly with an allowable design of 2,000 pounds (8896 N). Hold-down connectors shall be provided at the ends of each wall segment of the braced walls panel for the first story floor-to foundation connection with an allowable design of 3,900 pounds (17 347 N). In all cases, the hold-down connector force shall be transferred to the foundation.
 - 3.4. Cripple walls shall not be permitted.

Reason: As printed in the 2006 IBC, the required bracing percentages in Exception 3.2 appear to be in error as more bracing is required in the second story than the first story while the first story will have higher seismic loads. This code change proposes to correct this error in Exception 3.2 by including bracing percentages similar to those required by IRC Table R703.7(1). Additional editorial changes are made to clarify the intent of Exception 3.3. Further, in the first paragraph, the word "plane" is struck out of the term "two stories above grade plane" to avoid hillside walk-out basement configurations. Using the current grade plane wording essentially allows the basement story level walk-out facing exterior wall line and portions of the two perpendicular exterior walls to include veneer while only being braced for a two-story condition. The existing Exception 3 provisions are predicated on only two story levels of veneer. Exceptions 1 and 2 do not require the deletion of the grade plane wording because those provisions will allow a basement walk-out condition.

The code change corrects an error but will increase costs, although not substantially.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: This proposal corrects an obvious flaw in the wording of the exception for stone and masonry veneer.

Assembly Action:

None

Final Hearing Results

S229-07/08

AS

Code Change No: **S230-07/08**

Original Proposal

Sections: 2407.1.4 (New), 2407.1.4.1 (New), 2407.1.4.2 (New)

Proponent: William E. Koffel, PE, Koffel Associates, Inc., representing Glazing Industry Code Committee

Add new text as follows:

2407.1.4 Glazing in wind-borne debris regions. Glazing installed in in-fill panels or balusters in wind-borne debris regions shall comply with the following:

2407.1.4.1 Ballusters and infill panels. Glass installed in exterior railing in-fill panels or balusters shall be laminated glass complying with Category II of CPSC 16 CFR 1201 or Class A of ANSI Z97.1

2407.1.4.2 Glass supporting top rail. When the top rail is supported by glass, the assembly shall be tested according to the impact requirements of Section 1609.1.2. The top rail shall remain in place after impact.

Reason: The proposal enhances the code by helping to minimize the glass debris in a windstorm. Laminated glass installed in in-fill panels or balusters of exterior railings will remain integral after breakage occurs. In the case of all-glass type railings, structural integrity can be maintained by incorporating impact resistant glass. According to the Miami-Dade County Building Department, a dangerous situation resulted after the 2005 hurricanes in South Florida where top handrails fell off the buildings. It was noted that rails located in the small missile areas of the building that disengaged from the building become large missile debris in those areas. This proposal serves to qualify the glass railing system that can provide retention and structural integrity to support the rail after the glass has been impacted.

It is the intent of proposed 2407.1.4.2 to only require the missile impact test and not the cycling test requirements contained in the ASTM test standard.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: This code change furthers the elimination of wind-borne debris in hurricane regions, by adding requirements for glass in-fill panels used on the exterior in wind-borne debris regions.

Assembly Action:

None

Final Hearing Results

S230-07/08

AS

Code Change No: **S231-07/08**

Original Proposal

Section: 2409

Proponent: William E. Koffel, PE, Koffel Associates, Inc., representing Glazing Industry Code Committee

1. Revise as follows:

SECTION 2409
GLASS IN ELEVATOR HOISTWAYS AND ELEVATOR CARS

2409.1 Glass in elevator hoistway enclosures. Glass in elevator hoistway enclosures and hoistway doors shall be laminated glass conforming to ANSI Z97.1 or 16 CFR Part 1201. ~~Markings as specified in the applicable standard shall be on each separate piece of glass and shall remain visible after installation.~~

2. Add new text as follows:

2409.1.1 Fire-rated hoistways. Glass installed in hoistways and hoistway doors where the hoistway is required to have a fire resistance rating shall also comply with Section 715.

2409.1.2 Glass hoistway doors. The glass in glass hoistway doors shall be not less than 60 percent of the total visible door panel surface area as seen from the landing side.

2409.2 Glass vision panels. Glass in vision panels in elevator hoistway doors shall be permitted to be any transparent glazing material not less than 0.25 inches (0.64 mm) in thickness conforming to ANSI Z97.1 or 16CFR Part 1201. The area of any single vision panel shall not be less than 24 square inches (15484 mm²) and the total area of one or more vision panels in any hoistway door shall be not more than 85 square inches (54839 mm²).

2409.3 Glass in elevator cars. Glass in elevator car enclosures, glass elevator car doors, and glass used for lining walls and ceilings of elevator cars shall be laminated glass conforming to ANSI Z97.1 or 16CFR Part 1201.

Exception: Tempered glass shall be permitted to be used for lining walls and ceilings of elevator cars provided:

1. The glass is bonded to a nonpolymeric coating, sheeting, or film backing having a physical integrity to hold the fragments when the glass breaks.
2. The glass is not subjected to further treatment such as sandblasting; etching; heat treatment; or painting that could alter the original properties of the glass.
3. The glass is tested to the acceptance criteria for laminated glass as specified in ANSI Z97.1 or 16CFR Part 1201.

The glass in glass elevator car doors shall be not less than 60 percent of the total visible door panel surface area as seen from the car side of the doors.

Reason: The intent of Section 2409 was to include the requirements of ASME A17.1 in the Building Code. However, only a portion of the glass requirements contained in ASME A17.1 are currently included in the IBC. As such, there is considerable confusion regarding the glass requirements for elevator cars and elevator hoistways. The purpose of this proposal is to more fully incorporate the provisions of ASME A17.1 in the IBC. The proposed revisions are consistent with ASME A17.1 except as follows:

1. ASME A17.1 permits wired glass to be installed in vision panels in hoistway doors. The proposal does not permit the use of wired glass consistent with the requirements for glazing in hazardous locations.
2. ASME A171 permits the use of Type 3C film reinforced silvered mirror glass that conforms to a Canadian standard to be used in jurisdictions enforcing the National Building Code of Canada.

The language regarding marking of the glass has been deleted since Section 2406 already contains requirements for marking safety glazing. If the text proposed to be deleted is retained, the text will also need to be added in about five locations of the proposed text.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:**Approved as Submitted**

Committee Reason: Agreement with the proponent's reason which indicates that some confusion over glass requirements can be eliminated by including a more complete set of requirements for elevator cars and hoistways in Section 2409.

Assembly Action:**None**

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

William E. Koffel, P.E. Koffel Associates, Inc, representing Glazing Industry Code Committee, requests Approval as Modified by this Public Comment.

Modify proposal as follows:

**SECTION 2409
GLASS IN ELEVATOR HOISTWAYS AND ELEVATOR CARS**

2409.1 Glass in elevator hoistway enclosures. Glass in elevator hoistway enclosures and hoistway doors shall be laminated glass conforming to ANSI Z97.1 or 16 CFR Part 1201.

2409.1.1 Fire-rated hoistways. Glass installed in hoistways and hoistway doors where the hoistway is required to have a fire resistance rating shall also comply with Section 715.

2409.1.2 Glass hoistway doors. The glass in glass hoistway doors shall be not less than 60 percent of the total visible door panel surface area as seen from the landing side.

2409.2 Glass vision panels. Glass in vision panels in elevator hoistway doors shall be permitted to be any transparent glazing material not less than 0.25 inches (0.64 mm) in thickness conforming to Class A in accordance with ANSI Z97.1 or Category II in accordance with 16CFR Part 1201. The area of any single vision panel shall not be less than 24 square inches (15484 mm²) and the total area of one or more vision panels in any hoistway door shall be not more than 85 square inches (54839 mm²).

2409.3 Glass in elevator cars.

2409.3.1 Glass types. Glass in elevator car enclosures, glass elevator car doors, and glass used for lining walls and ceilings of elevator cars shall be laminated glass conforming to Class A in accordance with ANSI Z97.1 or Category II in accordance with CPSC 16CFR Part 1201.

Exception: Tempered glass shall be permitted to be used for lining walls and ceilings of elevator cars provided:

1. The glass is bonded to a nonpolymeric coating, sheeting, or film backing having a physical integrity to hold the fragments when the glass breaks.
2. The glass is not subjected to further treatment such as sandblasting; etching; heat treatment; or painting that could alter the original properties of the glass.
3. The glass is tested to the acceptance criteria for laminated glass as specified ~~in~~ for Class A in accordance with ANSI Z97.1 or Category II in accordance with CPSC 16CFR Part 1201.

2409.3.2 Surface area. The glass in glass elevator car doors shall be not less than 60 percent of the total visible door panel surface area as seen from the car side of the doors.

Commenter's Reason: The original proposal did not specify the category or classification of safety glazing required.

Final Hearing Results

S231-07/08**AMPC**

Code Change No: **S232-07/08**

Original Proposal

Table 2506.2, Chapter 35 (New); IRC R702.3.1, Chapter 43 (New)

Proponent: George Shortreed, Georgia-Pacific Gypsum LLC, representing Georgia-Pacific Gypsum LLC

THESE PROPOSALS ARE ON THE AGENDA OF THE IBC STRUCTURAL AND THE IRC BUILDING/ENERGY CODE DEVELOPMENT COMMITTEES AS 2 SEPARATE CODE CHANGES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IBC STRUCTURAL

1. Revise table as follows:

**TABLE 2506.2 (Supp)
GYPSUM BOARD MATERIALS AND ACCESSORIES**

MATERIAL		STANDARD
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Accessories for gypsum board	ASTM C 1047	
Adhesives for fastening gypsum wallboard	ASTM C 557	
Elastomeric joint sealants	ASTM C 920	
Exterior soffit board	ASTM C 931	
Fiber-reinforced gypsum panels	ASTM C 1278	
Glass mat gypsum backing panel	ASTM C 1178	
<u>Glass mat gypsum panel</u>	<u>ASTM C 1658</u>	
Glass mat gypsum substrate	ASTM C 1177	
Gypsum backing board and gypsum shaftliner board	ASTM C 442	
Gypsum ceiling board	ASTM C 1395	
Gypsum sheathing	ASTM C 79	
Gypsum wallboard	ASTM C 36	
Joint reinforcing tape and compound	ASTM C 474; C 475	
Nails for gypsum boards	ASTM C 514, F 547, F 1667	
Predecorated gypsum board	ASTM C 960	
Steel screws	ASTM C 954, C 1002	
Steel studs, load bearing	ASTM C 955	
Steel studs, nonload bearing	ASTM C 645	
Standard specification for gypsum board	ASTM C 1396	
Testing gypsum and gypsum products	ASTM C 22, C 472, C 473	
Water-resistant gypsum backing board	ASTM C 630	

2. Add standard to Chapter 35 as follows:

ASTM

ASTM C 1658/C 1658M-06 Standard Specification for Glass Mat Gypsum Panels.

PART II – IRC BUILDING/ENERGY

1. Revise as follows:

R702.3.1 Materials. All gypsum board materials and accessories shall conform to ASTM C 36, C 79, C 475, C 514, C 630, C 931, C 960, C 1002, C 1047, C 1177, C 1178, C 1278, C 1395, ~~or~~ C 1396 or C 1658 and shall be installed in accordance with the provisions of this section. Adhesives for the installation of gypsum board shall conform to ASTM C 557.

2. Add standard to Chapter 43 as follows:

ASTM

ASTM C 1658/C 1658M-06 Standard Specification for Glass Mat Gypsum Panels.

Reason: The purpose of this proposal is to add ASTM specifications for glass mat gypsum materials to the list of gypsum board materials presently in the code. These specifications have been developed by the ASTM consensus process and are comparable to other specifications listed. This includes a glass mat gypsum panel suitable for interior use.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Note: The following analysis was not in the Code Change Proposal book but was posted on the ICC website.

Analysis: Review of proposed new standard ASTM C 1658/C 1658M-06 indicated that, in the opinion of ICC Staff, the standard did comply with ICC standards criteria.

PART I – IBC STRUCTURAL

Committee Action:

Approved as Submitted

Committee Reason: This code change adds material requirements in the form of a referenced standard that is appropriate with the wider use of glass mat gypsum panel products.

Assembly Action:

None

PART II – IRC B/E

Committee Action:

Approved as Submitted

Committee Reason: This change adds the appropriate ASTM Standard for glass mat gypsum panel for interior use.

Assembly Action:

None

Final Hearing Results

S232-07/08, Part I	AS
S232-07/08, Part II	AS

Code Change No: S235-07/08

Original Proposal

Chapter 35

Proponent: James A. Rossberg, PE, Structural Engineering Institute of ASCE, representing Structural Engineering Institute of ASCE

Revise as follows:

CHAPTER 35 REFERENCED STANDARDS

ASCE/SEI

7—05 Minimum Design Loads for Buildings and Other Structures including Supplement No.1 and Supplement No. 2 and excluding Chapter 14 and Appendix 11A.

Reason: The purpose of this change is to adopt Supplement No. 2 to the 2005 edition of ASCE/SEI 7 which is shown below in its entirety. Supplement No. 2 revises the minimum base shear equations for both buildings and non-building structures. The need for this change was indicated by the results from the 75% Draft of *ATC-63, Quantification of Building System Performance and Response Parameters*, which indicate that tall buildings may fail at an unacceptably low seismic level and therefore the minimum base shear equation for buildings is being restored to that which appeared in the 2002 edition of ASCE 7.

Because nonbuilding structures not similar to buildings have low R-values compared to the special reinforced concrete moment frames studied in ATC-63, the ASCE 7 standards committee chose not to restore the high minimum base shears for nonbuilding structures not similar to buildings found in ASCE 7-02. In many cases, these previous minimum base shears gave many nonbuilding structures not similar to buildings

effective R-values less than 1.0. Therefore, the Seismic Subcommittee believes that the minimum base shear equation of $0.044S_{DS}I$ used for buildings should also be applied to nonbuilding structures not similar to buildings.

Supplement No. 2 was approved by the ASCE 7 standards committee in the summer of 2007 and will be opened for public review and comment in the fall of 2007. It is expected that Supplement No. 2 will have fully completed the ASCE consensus process prior to the 2008 spring ICC hearings.

Supplement No. 2 will be distributed via the SEI website, newsletters and assorted other media. Upon the next printing of ASCE 7-05 it will be included directly in the text of the document. The complete text of Supplement No. 2 is as follows:

Supplement No. 2 to ASCE 7-05:

Revise Equation 12.8-5 of Section 12.8.1.1 of ASCE 7-05 as shown below:

12.8.1.1 Calculation of Seismic Response Coefficient. The seismic response coefficient, C_s , shall be determined in accordance with Eq. 12.8-2.

$$C_s = \frac{S_{DS}}{\left(\frac{R}{I}\right)} \quad (\text{Eq. 12.8-2})$$

where:

- S_{DS} = the design spectral response acceleration parameter in the short period range as determined from Section 11.4.4
- R = the response modification factor in Table 12.2-1, and
- I = the occupancy importance factor determined in accordance with Section 11.5.1

The value of C_s computed in accordance with Eq. 12.8-2 need not exceed the following:

$$C_s = \frac{S_{D1}}{T\left(\frac{R}{I}\right)} \quad \text{for } T \leq T_L \quad (\text{Eq. 12.8-3})$$

$$C_s = \frac{S_{D1}T_L}{T^2\left(\frac{R}{I}\right)} \quad \text{for } T > T_L \quad (\text{Eq. 12.8-4})$$

C_s shall not be less than
 $C_s = 0.04 \underline{0.044S_{DS}} \geq 0.01 \quad (\text{Eq. 12.8-5})$

In addition, for structures located where S_1 is equal to or greater than 0.6g, C_s shall not be less than

$$C_s = \frac{0.5S_1}{\left(\frac{R}{I}\right)} \quad (\text{Eq. 12.8-6})$$

where I and R are as defined in Section 12.8.1.1 and

- S_{D1} = the design spectral response acceleration parameter at a period of 1.0 sec, as determined from Section 11.4.4
- T = the fundamental period of the structure (sec) determined in Section 12.8.2
- T_L = long-period transition period (sec) determined in Section 11.4.5
- S_1 = the mapped maximum considered earthquake spectral response acceleration parameter determined in accordance with Section 11.4.1

Revise Equations 15.4-1 and 15.4-2 of Section 15.4.1, item 2, as shown below:

2. For nonbuilding systems that have an R value provided in Table 15.4-2, the seismic response coefficient (C_s) shall not be taken less than

$$C_s = 0.03 \underline{0.044S_{DS}} \geq 0.03 \quad (15.4-1)$$

and for nonbuilding structures located where $S_1 \geq 0.6g$, C_s shall not be taken less than

$$C_s = \frac{0.8S_1}{\left(\frac{R}{I}\right)} \quad (15.4-2)$$

EXCEPTION: Tanks and vessels that are designed to AWWA D100, AWWA D103, API 650 Appendix E, and API 620 Appendix L as modified by this standard, shall be subject to the larger of the minimum base shear values defined by the reference document or the following equations:

$$C_s = 0.04 \underline{0.044S_{DS}} \geq 0.01 \quad (15.4-3)$$

and for nonbuilding structures located where $S_1 \geq 0.6g$, C_s shall not be taken less than

$$C_s = \frac{0.5 S_1}{\left(\frac{R}{I}\right)} \quad (15.4-4)$$

Minimum base shear requirements need not apply to the convective (sloshing) component of liquid in tanks.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: This proposal adds a supplement to the currently referenced edition of ASCE 7, which restores prior minimum base shear requirements for earthquake design.

Assembly Action:

None

Final Hearing Results

S235-07/08

AS

Code Change No: S236-07/08

Original Proposal

Chapter 35

Proponent: David P. Tyree, P.E., C.B.O., American Forest & Paper Association, representing American Forest & Paper Association

Revise as follows:

**CHAPTER 35
REFERENCED STANDARDS**

American Forest and Paper Association

ANSI/AF&PA SDPWS-05-08 AF&PA Supplement Special Design Provisions for Wind and Seismic

Reason: This is an update to an existing AF&PA/ANSI Standard. The new supplement is scheduled to be approved as an AF&PA standard by June 2008. The supplement will further be approved as an ANSI consensus standard by August 2008. *ANSI / AF&PA SDPWS-2008 - Special Design Provisions for Wind and Seismic standard with Commentary* covers materials, design and construction of wood members, fasteners, and assemblies to resist wind and seismic forces. Engineered design of wood structures to resist wind or seismic forces is either by allowable stress design (ASD); or load and resistance factor design (LRFD). Criteria for proportioning, design, and detailing of engineered wood systems, members, and connections in lateral force resisting systems is provided. Nominal shear capacities of diaphragms and shear walls are provided for reference assemblies.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: Disapproved at the proponent's request, because the updated standard is not complete. The standard is needed and the committee is hopeful that a public comment will be submitted.

Assembly Action:

None

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

David P. Tyree, PE, CBO, American Forest & Paper Association, requests Approval as Submitted.

Commenter's Reason: This proposal updated an existing AF&PA/ANSI Standard referenced in the IBC - ANSI / AF&PA SDPWS-2008 - Special Design Provisions for Wind and Seismic standard with Commentary is scheduled to be available on 7/31/08. The ICC Structural Committee felt there was a need for this updated standard to be referenced in the 2009 IBC, but could not recommend approval without the standard being completed. The reason statement in their findings also stated that they hoped for a public comment. This standard (when completed) will be posted on our website for free download for all users. www.awc.org.

Final Hearing Results

S236-07/08

AS

Code Change No: S238-07/08

Original Proposal

Chapter 35

Proponent: Standards writing organizations as listed below.

Revise standards as follows:

AA	The Aluminum Association 1525 Wilson Blvd., Suite 600 Arlington, VA 22209
Standard reference number	Title
ADM4-2005	Aluminum Design Manual: Part I-A Specification for Aluminum Structures - Allowable Stress Design; and Part I-B Specification for Aluminum Structures - Building Load and Resistance Factor Design
AAMA	American Architectural Manufacturers Association 1827 Waldon Office Square, Suite 550 Schaumburg, IL 60173
Standard reference number	Title
<u>AAMA/WDMA/CSA</u> 101/1.S.2/A440-08 05	North American Fenestration Standard/Specifications for Windows, Doors and Unit Skylights

AISI

American Iron and Steel Institute
1140 Connecticut Avenue, Suite 706
Washington, DC 20036

Standard reference number	Title
General—04 AISI S200-07	North American Standard for Cold-formed Steel Framing—General Provisions
Header—04 AISI S212-07	North American Standard for Cold-formed Steel Framing—Header Design
Lateral—04 AISI S213-07	North American Standard for Cold-formed Steel Framing—Lateral Design
NAS—04 AISI S100-07	North American Specification for the Design of Cold-formed Steel Structural Members, including 2004 Supplement
PM—04 AISI S230-07	Standard for Cold-formed Steel Framing—Prescriptive Method for One- and Two-family Dwellings, including 2004 Supplement
Truss—04 AISI S214-07	North American Standard for Cold-formed Steel Framing—Truss Design
WSD—04 AISI S211-07	North American Standard for Cold-formed Steel Framing—Wall Stud Design

AITC

American Institute of Timber Construction
7012 S. Revere Parkway, Suite 140
Englewood, CO 80112

Standard reference number	Title
ANSI/AITC A 190.1— 07 02	Structural Glued Laminated Timber

ASTM

ASTM International
100 Barr Harbor Drive
West Conshohocken, PA 19428-2959

Standard reference number	Title
A 6/A 6M- 07 05	Specification for General Requirements for Rolled Structural Steel Bars, Plates, Shapes, and Sheet Piling
A 185/A 185M- 06E01 05a	Specification for Steel Welded Wire Reinforcement, Plain for Concrete
A 240/A 240M- 07 05a	Standard Specification for Chromium and Chromium-nickel Stainless Steel Plate, Sheet and Strip for Pressure Vessels and for General Applications
A 307- 04E01	Specification for Carbon Steel Bolts and Studs, 60,000 psi Tensile Strength
A 416/A 416M— 06 02	Specification for Steel Strand, Uncoated Seven-Wire for Prestressed Concrete
A 435/A 435M— 90(2007)	Specification for Straight-beam Ultrasonic Examination of Steel Plates
A 463/A 463M – 05 02a	Standard Specification for Steel Sheet, Aluminum-Coated, by the Hot Dip Process
A 480/A 480M— 06b 05	Specification for General Requirements for Flat-rolled Stainless and Heat-resisting Steel Plate, Sheet and Strip
A 497 A 497M- 06e01 05a	Specification for Steel Welded Reinforcement Deformed, for Concrete
A 510— 06 03	Specification for General Requirements for Wire Rods and Coarse Round Wire, Carbon Steel
A 568/A 568M- 06a 05a	Specification for Steel, Sheet, Carbon, Structural and High-Strength, Low-Allow, Hot-rolled and Cold-rolled, General Requirements for
A 572/A 572M— 07 04	Specification for High-Strength Low-alloy Columbium-Vanadium Structural Steel
A 653/A 653- 07 06	Specification for Steel Sheet, Zinc-Coated Galvanized or Zinc-Iron Alloy-Coated Galvannealed by the Hot-Dip Process
A 690/A 690M- 07 05	Standard Specification for High Strength Low-Alloy Nickel, Copper, Phosphorus Steel H-Piles and Sheet Piling with Atmospheric Corrosion Resistance for Use in Marine Environments

CODE CHANGES RESOURCE COLLECTION – INTERNATIONAL BUILDING CODE

A 722/A 722M- <u>07</u> 05	Specification for Uncoated High-Strength Steel Bar for Prestressing Concrete
A 775/A 775M- <u>07</u> 04a	Specification for Epoxy-coated Steel Reinforcing Bars
A 792A 792M- <u>06a</u> 05	Specification for Steel Sheet, 55% Aluminum-zinc Allow-coated by the Hot-dip Process
A 875/A 875M- <u>06</u> 05	Standard Specification for Steel Sheet Zinc-5 percent, Aluminum Allow-Coated by the Hot-dip Process
A 884-A884M- <u>06</u> 04	Specification for Epoxy-coated Steel Wire and Welded Wire Fabric for Reinforcement
A 898/A 898M— <u>07</u> 91 (2004)	Specification for Straight Beam Ultrasonic Examination of Rolled Steel Shapes
A 924/A924M— <u>07</u> 04	Standard Specification for General Requirements for Steel Sheet, Metallic-coated by the Hot-dip Process
A 951—06 02	Specification for <u>Steel Wire</u> Masonry Joint Reinforcement
A 992/A 992M- <u>06a</u> 04a	Standard Specification for Structural Shapes
A 996/A 996M- <u>06a</u> 05a	Specification for Rail-steel and Axle-steel Deformed Bars for Concrete Reinforcement
A 1008/A 1008M- <u>07</u> 05b	Specification for Steel, Sheet, Cold-rolled, Carbon, Structural, High-strength Low-allow and High-strength Low-alloy with Improved Formability
B 209— <u>06</u> 04	Specification for Aluminum and Aluminum Alloy Steel and Plate
C 31/31M- <u>06</u> 03a	Practice for Making and Curing Concrete Test Specimens in the Field
C 55— <u>06e01</u> 03	Specification for Concrete <u>Building</u> Brick
C 61/C 61M—00(2006)	Specification for Gypsum Keene's Cement
C 67- <u>07</u> 05	Test Methods of Sampling and Testing Brick and Structural Clay Tile
C 90-06b	Specification for Loadbearing Concrete Masonry Units
C 150- <u>07</u> 05	Specification for Portland Cement
C 212—00(2006)	Specification for Structural Clay Facing Tile
C 216- <u>07</u> 05a	Specification for Facing Brick (Solid Masonry Units Made From Clay or Shale)
C 270- <u>07</u> 05a	Specification for Mortar for Unit Masonry
C 315—02	Specification for Clay Flue <u>Liners</u> <u>ings</u> <u>and</u> <u>Chimney</u> <u>Pots</u>
C 406- <u>06e01</u> 05	Specification for Roofing Slate
C 473- <u>06a</u> 05	Test Methods for Physical Testing of Gypsum Panel Products
C 474— <u>05</u> 02	Test Methods for Joint Treatment Materials for Gypsum Board Construction
C 475— <u>05</u> 04	Specification for Joint Compound and Joint Tape for Finishing Gypsum Wall Board
C 557—03 <u>e01</u>	Specification for Adhesives for Fastening Gypsum Wallboard to Wood Framing
C 578- <u>07</u> 05a	Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation
C 595- <u>07</u> 05	Specification for Blended Hydraulic Cements
C 636/C36M— <u>06</u> 04	Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels
C 645- <u>07</u> -04a	Specification for Nonstructural Steel Framing Members
C 836- <u>06</u> 05	Specification for High Solids Content, Cold Liquid-Applied Elastomeric Waterproofing Membrane for Use with Separate Wearing Course
C 840- <u>07</u> 05	Specification for Application and Finishing of Gypsum Board
C 842— <u>05</u> 99	Specification for Application of Interior Gypsum Plaster

C 843—99(2006) e04	Specification for Application of Gypsum Veneer Plaster
C 847—06 00	Specification for Metal Lath
C 931/C 931M—04	Specification for Exterior Gypsum Soffit Board
C 932-06 05	Specification for Surface-Applied Bonding <u>Compounds</u> Agents for Exterior Plastering
C 955—06 03	Standard Specification for Load-bearing Transverse and Axial Steel Studs, Runners Tracks, and Bracing or Bridging, for Screw Application of Gypsum Panel Products and Metal Plaster Bases
C 957- 06 05a	Specification for High-Solids Content, Cold Liquid-Applied Elastomeric Waterproofing Membrane with Integral Wearing Surface
C1032—06 04	Specification for Woven Wire Plaster Base
C1063—06 03	Specification for Installation of Lathing and Furring to Receive Interior and Exterior Portland Cement Based Plaster
C 1072-06 05b	Standard Text Method for Measurement of Masonry Flexural Bond Strength
C 1088—07a 02	Specification for Thin Veneer Brick Units Made from Clay or Shale
C 1177/C 1177M-06 04e04	Specification for Glass Mat Gypsum Substrate for Use as Sheathing
C 1178/C 1178M-06 04e04	Specification for <u>Coated</u> Glass Mat Water-Resistant Gypsum Backing Panel
C 1186—07 02	Specification for Flat Non <u>Asbestos</u> Fiber Cement Sheets
C 1261-07 05	Specification for Firebox Brick for Residential Fireplaces
C 1278/C 1278M-06 03e04	Specification for Fiber-Reinforced Gypsum Panels
C 1283—07 03e04	Practice for Installing Clay Flue <u>Linings</u>
C1314—07 03b	Test Method for Compressive Strength of Masonry Prisms
C1386— 07 98	Specification for Precast Autoclaved Aerated Concrete (PAAC) Wall Construction Units
C1396/1396M—06a 02	Standard Specifications for Gypsum Wall Board
C 1405-07 0a05a	Standard Specification for Glazed Brick (Single Fired, Solid Brick Units)
D 225-04 05	Specification for Asphalt Shingles (Organic Felt) Surfaced with Mineral Granules
D 226-06 05	Specification for Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing
D 312—00(2006)	Specification for Asphalt Used in Roofing
D 422—63 (2002)e01	Test Method for Particle-size Analysis of Soils
D 450—07 96 (2000)e04	Specification for Coal-tar Pitch Used in Roofing, Dampproofing and Waterproofing
D 635—06 03	Test Method for Rate of Burning and/or Extent and Time of Burning of Self-Supporting Plastics in a Horizontal Position
D1143/D1143M—07 (1994) E04	Test Method for Piles Under Static Axial Compressive Load
D 1227—95(2007)2000	Specification for Emulsified Asphalt Used as a Protective Coating for Roofing
D1761—06 88 (2000) e04	Test Method for Mechanical Fasteners in Wood
D 2166-06 00e04	Test Method for Unconfined Compressive Strength of Cohesive Soil
D 2487—06 00	Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System)

CODE CHANGES RESOURCE COLLECTION – INTERNATIONAL BUILDING CODE

D 2822— <u>05 94 (97)e01</u>	Specification for Asphalt Roof Cement
D 3019— <u>94(2007) e01(Supp)</u>	Specification for Lap Cement Used with Asphalt Roll Roofing, Nonfibered, Asbestos Fibered and Nonasbestos Fibered
D3201— <u>07 94 (2003)</u>	Test Method for Hygroscopic Properties of Fire-retardant-treated Wood and Wood-based Products
D 3161— <u>06 03b</u>	Test Method for a Wind Resistance of Asphalt Shingles (Fan Induced Method)
D 3462— <u>07 04</u>	Specification for Asphalt Shingles Made from Glass Felt and Surfaced with Mineral Granules
D 3468— <u>99(2006)e01</u>	Specification for Liquid-Applied Neoprene and Chlorosulfonated Polyethylene Used in Roofing and Waterproofing
D3689—90 (1995)	Method for Testing Individual Piles Under Static Axial Tensile Load
D 3737— <u>07 05</u>	Practice for Establishing Allowable Properties for Structural Glued Laminated Timber (Glulam)
D 3747—79 (2007 <u>0e01</u>)	Specification for Emulsified Asphalt Adhesive for Adhering Roof Insulation
D 3957— <u>06 03</u>	Standard Practices for Establishing Stress Grades for Structural Members Used in Log Buildings
D 4022— <u>07 94 (2000)e01</u>	Specification for Coal Tar Roof Cement, Asbestos Containing
D 4434— <u>06 04</u>	Specification for Poly (Vinyl Chloride) Sheet Roofing
D 4479— <u>07 00</u>	Specification for Asphalt Roof Coatings—Asbestos-free
D 4829— <u>07 03</u>	Test Method for Expansion Index of Soils
D 4869— <u>05e01 04</u>	Specification for Asphalt-Saturated (Organic Felt) Underlayment Used in Steep Slope Roofing
D 5019— <u>07 96e01</u>	Specification for Reinforced Nonvulcanized Polymeric Sheet Used in Roofing Membrane
D 5643— <u>06 94 (2000)e01</u>	Specification for Coal Tar Roof Cement, Asbestos-free
D 5665— <u>99a(2006)</u>	Specification for Thermoplastic Fabrics Used in Cold-applied Roofing and Waterproofing
D 6694— <u>07 01</u>	Standard Specification for Liquid-applied Silicone Coating Used in Spray Polyurethane Foam Roofing
D 6757— <u>07 02</u>	Standard Specification for Inorganic Underlayment for Use with Steep Slope Roofing Products
D 6878— <u>06a 03</u>	Standard Specification for Thermoplastic Polyolefin Based Sheet Roofing
D 7158— <u>07-05</u>	Standard Test Method for Wind Resistance of Sealed Asphalt Shingles (Uplift Force/Uplift Resistance Method)
E 518— <u>03e01</u>	Standard Test Methods for Flexural Bond Strength of Masonry
E 519— <u>07 02</u>	Standard Test Method for Diagonal Tension (Shear) in Masonry Assemblages
E 1996- <u>06 05b</u>	Specification for Performance of Exterior Windows, Curtain Walls, Doors and <u>Impact Protective Systems</u> Storm Shutters Impacted by Windborne Debris in Hurricanes
G 152— <u>06 04</u>	Practice for Operating Open Flame Carbon Arc Light Apparatus for Exposure of Nonmetallic Materials

AWPA

American Wood Protection Association
P. O. Box 361784
Birmingham, AL 35236-1784

Standard
reference
number

Title

U1-07 06

USE CATEGORY SYSTEM: User Specification for Treated wood except Section 6 Commodity Specification H

DASMA

Door and Access Systems Manufacturers Association International
1300 Summer Avenue
Cleveland, OH 44115-2851

Standard
reference
number

Title

108-05 02

Standard Method for Testing Sectional Garage Doors and Rolling Doors: Determination of Structural Performance Under Uniform Static Air Pressure Difference

115-05 03

Standard Method for Testing Sectional Garage doors and Rolling Doors: Determination of Structural Performance Under Missile Impact and Cyclic Wind Pressure

DOC

U.S. Department of Commerce
National Institute of Standards and Technology
100 Bureau Drive Stop 3460
Gaithersburg, MD 20899

Standard
reference
number

Title

PS-1—07 95

~~Construction and Industrial~~ Structural Plywood

GA

Gypsum Association
810 First Street, NE #510
Washington, DC 20002-4268

Standard
reference
number

Title

GA 216—07 04

Application and Finishing of Gypsum ~~Board~~ Panel Products

PTI

Post-Tensioning Institute
8601 N. Black Canyon Hwy., Suite 103
Phoenix, AZ 85021

Standard
reference
number

Title

PTI—2007 2004

Standard Requirements for Analysis of Shallow Concrete Foundations on Expansive Soils, ~~First~~ Third Edition

PTI—2007 2004

Standard Requirements for Design of Shallow Post-tensioned Concrete Foundation on Expansive Soils, Second Edition

SPRI

Single Ply Roofing Institute
77 Rumford Avenue, Suite 3-B
Waltham, MA 02453

Standard
reference
number

Title

ANSI/SPRI/FM4435-ES-103

Wind Design Standard for Edge Systems Used with Low Slope Roofing Systems

TIA

Telecommunications Industry Association
2500 Wilson Boulevard
Arlington, VA 22201-3834

Standard
reference
number

Title

TIA/EIA-222-G-1- 2007 2005

Structural Standards for Steel Antenna Towers and Antenna Supporting Structures – Addendum 1, including Addendum 1, 222-G-1

TMS

The Masonry Society
3970 Broadway, Unit 201-D
Boulder, CO 80304-1135

Standard
reference
number

Title

402—08 05

~~Building Code Requirements for Masonry Structures~~

602—08 05

~~Specification for Masonry Structures~~

CODE CHANGES RESOURCE COLLECTION – INTERNATIONAL BUILDING CODE

TPI

Truss Plate Institute
218 North Lee Street, Suite 312
Arlington, VA 22314

Standard
reference
number

Title

TPI 1— ~~2007~~ 2002

National Design Standards for Metal Plate Connected Wood Truss Construction

UL

Underwriters Laboratories
333 Pfingsten Road
Northbrook, IL 60062

Standard
reference
number

Title

580—~~2006~~ 94

Test for Uplift Resistance of Roof Assemblies—~~with Revisions through February 1998~~

1258-02

Fire Test of Roof Deck Construction – with Revisions through January 2007

2390—~~2003~~ 04

Test Method for ~~Measuring the Wind Resistant~~ Uplift Coefficients for Asphalt Shingles with Sealed Tabs with Revisions through January 2004

WDMA

Window and Door Manufacturers Association
1400 East Touhy Avenue #470
Des Plaines, IL 60018

Standard
reference
number

Title

AAMA/WDMA/CSA101/I.S.2/A
440—~~08~~ 05

Specifications for Windows, Doors and Unit Skylights

Reason: The *CP 28 Code Development Policy*, Section 4.5* requires the updating of referenced standards to be accomplished administratively, and be processed as a Code Change Proposal. In May 2007, a letter was sent to each developer of standards that are referenced in the International Codes, asking them to provide ICC with a list of their standards in order to update to the current edition. Above is the received list of the referenced standards that are under the maintenance responsibility of the IBC Structural Committee.

***4.5 Updating Standards:** The updating of standards referenced by the Codes shall be accomplished administratively by the appropriate code development committee in accordance with these full procedures except that multiple standards to be updated may be included in a single proposal.

Public Hearing Results

Delete reference to TMS standards as follows:

TMS

The Masonry Society
3970 Broadway, Unit 201-D
Boulder, CO 80304-1135

Standard
reference
number

Title

402—~~08~~ 05

Building Code Requirements for Masonry Structures

602—~~08~~ 05

Specification for Masonry Structures

Errata: Revise TIA standard update to read as follows:

222-G—2005 Structural Standard for Antenna Supporting Structures and Antennas, including Addendum 1, 222-G-1 dated 2007.

Committee Action:

Approved as Submitted

Committee Reason: Approval of this code change assures that the IBC will reflect the latest updates from these standards developing organizations.

Assembly Action:

None

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because public comments were submitted.

Public Comment 1:

Bonnie Manley, American Iron and Steel Institute, requests Approval as Modified by this Public Comment.

Modify proposal as follows:

AISI S230-07 Standard for Cold-formed Steel Framing—Prescriptive Method for One- and Two-family Dwellings, with Supplement 2, dated 2008

(Portions of proposal not shown remain unchanged)

Commenter's Reason: AISI S230-07 w/ S2-08 -: This modification adopts the recently completed Supplement 2 to AISI S230-07 (Standard for Cold-Formed Steel Framing – Prescriptive Method for One- and Two-family Dwellings, 2007 Edition). This supplement was issued in June 2008 and is available for download from the AISI website: www.steel.org. (Click on "Construction" link and then click on "Codes and Standards" link.) It completely replaces Supplement 1 to AISI S230-07, and is intended to revise and clarify provisions related to low wind and low seismic wall bracing.

Please note, to fully integrate AISI S230-07, Supplement 2 into the ICC Codes, public comments have also been submitted on Proposals RB11-07/08 and RB168-07/08.

Public Comment 2:

Bonnie Manley, American Iron and Steel Institute, requests Approval as Modified by this Public Comment.

Modify proposal as follows:

AISI S214-07 North American Standard for Cold-formed Steel Framing – Truss Design, with Supplement 2, dated 2008

(Portions of proposal not shown remain unchanged)

Commenter's Reason: AISI S214-07 w/ S2-08. This modification adopts the recently completed Supplement 2 to AISI S214-07 (North American Standard for Cold-Formed Steel Framing – Truss Design, 2007 Edition). This supplement was issued in June 2008 and is available for download from the AISI website: www.steel.org. (Click on "Construction" link and then click on "Codes and Standards" link.) It completely replaces Supplement 1 to AISI S214-07, and revises and clarifies provisions related to design responsibilities, loading, quality criteria and bracing for greater consistency with building codes and industry practice. Specifically, the purpose of this supplement is to better harmonize with the provisions desired by involved industry groups, including NCSEA and WTCA, which were initially documented in IBC Proposal S209-07/08. Please note, to fully integrate AISI S214-07, Supplement 2 into the IBC, a public comment has also been submitted on Proposal S209-07/08.

Final Hearing Results

S238-07/08**AMPC1, 2**

2006 INTERNATIONAL FIRE CODE

Code Change No: **F84-07/08**

Original Proposal

Sections: 509.1 (IBC [F] 911.1)

Proponent: Ken Kraus, Fire Department, Los Angeles, CA

Revise as follows:

509.1 (IBC [F] 911.1) (Supp) Features. Where required by other sections of this code and in all buildings classified as high-rise buildings by the *International Building Code*, a fire command center for fire department operations shall be provided. The location and accessibility of the fire command center shall be approved by the fire department. The fire command center shall be separated from the remainder of the building by not less than a 1-hour fire barrier constructed in accordance with Section 706 of the *International Building Code* or horizontal assembly constructed in accordance with Section 711 of the *International Building Code*, or both. The room shall be a minimum of ~~96~~ 250 square feet (~~9~~ 23 m²) with a minimum dimension of ~~8~~ 10 feet (~~2438~~ 3048 mm). A layout of the fire command center and all features required by this section to be contained therein shall be submitted for approval prior to installation. The fire command center shall comply with NFPA 72 and shall contain the following features:

1. The emergency voice/alarm communication system unit.
2. The fire department communications system.
3. Fire-detection and alarm system annunciator system.
4. Annunciator unit visually indicating the location of the elevators and whether they are operational.
5. Status indicators and controls for air-handling systems.
6. The fire-fighters control panel required by Section 909.16 for smoke control systems installed in the building.
7. Controls for unlocking stairway doors simultaneously.
8. Sprinkler valve and water-flow detector display panels.
9. Emergency and standby power status indicators.
10. A telephone for fire department use with controlled access to the public telephone system.
11. Fire pump status indicators.
12. Schematic building plans indicating the typical floor plan and detailing the building core, means of egress, fire protection systems, fire-fighting equipment and fire department access.
13. Work table.
14. Generator supervision devices, manual start and transfer features.
15. Public address system, where specifically required by other sections of this code.
16. Elevator fire recall switch in accordance with ASME A17.1.
17. Elevator emergency or standby power selector switch(es), where emergency or standby power is provided.

Reason: This proposal is intended to increase the minimum size of the Fire Command Center to a size and configuration that is conducive to effective use of the facility by emergency responders.

The current minimum requirement for the size of a Fire Command Center is impractical. Fire Command Centers (FCC) not only need to be designed to accommodate a significant number of emergency responders wearing full personal protective equipment. FCC's are also used to review building emergency plans during incidents, co-locate decision makers within the Incident Command System (ICS) and interpret fire protection system information. Given the multiple uses of the FCC, it is extremely likely that the limitations of a 10' by 10' room would serve to compromise the effectiveness of Incident management.

The current minimum size has proven in both exercise and emergency incident scenarios to be too small and confining.

A minimum size of 250 square feet allows for the necessary personnel to effectively perform the required tasks associated with a Fire Command Center.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Modified

Modify the proposal as follows:

509.1 (IBC [F] 911.1) (Supp) Features. Where required by other sections of this code and in all buildings classified as high-rise buildings by the *International Building Code*, a fire command center for fire department operations shall be provided. The location and accessibility of the fire command center shall be approved by the fire department. The fire command center shall be separated from the remainder of the building by not less than a 1-hour fire barrier constructed in accordance with Section 706 of the *International Building Code* or horizontal assembly constructed in accordance with Section 711 of the *International Building Code*, or both. The room shall be a minimum of ~~250~~ 200 square feet (23 19 m²) with a minimum dimension of 10 feet (3048 mm). A layout of the fire command center and all features required by this section to be contained therein shall be submitted for approval prior to installation. The fire command center shall comply with NFPA 72 and shall contain the following features:

(Features 1 through 17 are unchanged)

Committee Reason: The proposal was approved because the committee felt that it will provide additional working room for the fire command staff who will occupy the fire command center. The modification provides a more reasonable working size for the fire command center.

Assembly Action:

None

Final Hearing Results

F84-07/08

AM

Code Change No: F85-07/08

Original Proposal

Sections: 509.1 (IBC [F] 911.1)

Proponent: Lawrence G. Perry, AIA, representing Building Owners and Managers Association International (BOMA)

Revise as follows:

509.1 (IBC [F] 911.1) (Supp) Features. Where required by other sections of this code and in all buildings classified as high-rise buildings by the *International Building Code*, a fire command center for fire department operations shall be provided. The location and accessibility of the fire command center shall be approved by the fire department. The fire command center shall be separated from the remainder of the building by not less than a 1-hour fire barrier constructed in accordance with Section 706 of the *International Building Code* or horizontal assembly constructed in accordance with Section 711 of the *International Building Code*, or both. The room shall be a minimum of 96 square feet (9 m²) with a minimum dimension of 8 feet (2438 mm). A layout of the fire command center and all features required by this section to be contained therein shall be submitted for approval prior to installation. The fire command center shall comply with NFPA72 and shall contain the following features:

1. The emergency voice/alarm communication system unit.
2. The fire department communications system.
3. Fire-detection and alarm system annunciator system.
4. Annunciator visually indicating the location of the elevators and whether they are operational.
5. Status indicators and controls for air-handling systems.
6. The fire-fighter=s control panel required by Section 909.16 for smoke control systems installed in the building.
7. Controls for unlocking stairway doors simultaneously.
8. Sprinkler valve and water-flow detector display panels.
9. Emergency and standby power status indicators.
10. A telephone for fire department use with controlled access to the public telephone system.
11. Fire pump status indicators.
12. Schematic building plans indicating the typical floor plan and detailing the building core, means of egress, fire protection systems, fire-fighting equipment and fire department access, and the location of fire walls, fire barriers, fire partitions, smoke barriers and smoke partitions.
13. Work table.
14. Generator supervision devices, manual start and transfer features.

15. Public address system, where specifically required by other sections of this code.
16. Elevator fire recall switch in accordance with ASME A17.1.
17. Elevator emergency or standby power selector switch(es), where emergency or standby power is provided.

Reason: This proposal will add additional information to first responders in buildings having fire command centers. It will require that the schematic building plans, which are already required, include the location of fire walls, fire barriers, fire partitions, smoke barriers, and smoke partitions. BOMA believes this is a far better method of providing this information to fire inspectors and responding fire fighters than providing stencils or stickers on walls throughout the building. BOMA has submitted a separate proposal to delete the requirement for marking of rated walls (newly added to Section 703.6 of the IBC).

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The proposal was approved because the committee felt that it will provide the emergency operations commander with needed information in a convenient location at little or no cost.

Assembly Action:

None

Final Hearing Results

F85-07/08

AS

Code Change No: F87-07/08

Original Proposal

Sections: 511 (New), 907.2.12.2 (IBC [F] 907.2.12.2), Appendix I (New)

Proponent: Tom Lariviere, Fire Department, Madison, MS, representing Joint Fire Service Review Committee

1. Add new text as follows:

SECTION 511
EMERGENCY RESPONDER RADIO COVERAGE

511.1 Emergency responder radio coverage in new buildings. All new buildings shall have approved radio coverage for emergency responders within the building.

511.2 Emergency responder radio coverage in existing buildings. Existing buildings that do not have approved radio coverage for emergency responders within the building shall be equipped with such coverage within 18 months of receiving notice of such deficiency from the fire code official.

2. Revise as follows:

907.2.12.2 (IBC [F] 907.2.12.2) (Supp) Fire department communication system. An approved ~~two-way, fire department communication~~ emergency responder radio coverage system designed and installed in accordance with NFPA 72 shall be provided for fire department use. It shall operate between a fire command center complying with Section 509 and elevators, elevator lobbies, emergency and standby power rooms, fire pump rooms, areas of refuge and inside enclosed exit stairways. ~~The fire department communication device shall be provided at each floor level within the enclosed exit stairway.~~

Exception: ~~Fire department radio systems where approved by the fire department.~~

3. Add new appendix as follows:

APPENDIX I
EMERGENCY RESPONDER RADIO COVERAGE

SECTION I101
GENERAL

I101 Scope. Systems, components, and equipment required to provide emergency responder radio coverage shall be in accordance with this appendix.

I101.1 Permit. A construction permit is required for installation of or modification to emergency responder radio coverage systems and related equipment. Maintenance performed in accordance with this code is not considered a modification and does not require a permit.

SECTION I102
DEFINITIONS

I102.1 Definitions. For the purpose of this appendix, certain terms are defined as follows:

AGENCY. Any emergency responder department within the jurisdiction that utilizes radio frequencies for communication. This could include, but not be limited to, various public safety agencies such as fire department, emergency medical services and law enforcement.

SECTION I103
TECHNICAL REQUIREMENTS

I103.1 Radio signal strength. The building shall be considered to have acceptable emergency responder radio coverage when signal strength measurements in 90 percent of all areas on each floor of the building meet the signal strength requirements in Sections I103.1.1 and I103.1.2.

I103.1.1 Minimum signal strength into the building. A minimum signal strength of -95 dBm shall be receivable within the building.

I103.1.2 Minimum signal strength out of the building. A minimum signal strength of -100 dBm shall be received by the agency's radio system when transmitted from within the building.

I103.2 System design. The emergency responder radio coverage system shall be designed in accordance with Sections I103.2.1 through I103.2.5.

I103.2.1 Amplification Systems Allowed. Buildings and structures which cannot support the required level of radio coverage shall be equipped with a radiating cable system, a distributed antenna system with FCC certified signal boosters, or other system approved by the fire code official in order to achieve the required adequate radio coverage.

I103.2.2 Technical criteria. The fire code official shall maintain a document providing the specific technical information and requirements for the emergency responder radio coverage system. This document shall contain, but not be limited to, the various frequencies required, the location of radio sites, effective radiated power of radio sites, and other supporting technical information.

I103.2.3 Secondary power. The emergency responder radio coverage system shall be equipped with a secondary source of power. The secondary source of power shall be either a battery system or an emergency generator. The secondary power supply shall supply power automatically when the primary power source is lost. The secondary source of power shall be capable of operating the emergency responder radio coverage system for a period of at least twelve hours.

I103.2.3.1 Battery Systems. The active components of the installed system or systems shall be capable of operating on an independent battery system for a period of at least twelve hours without external power input. The battery system shall automatically charge in the presence of external power input.

I103.2.4 Signal Booster requirements. If used, signal boosters shall meet the following requirements:

1. All signal booster components shall be contained in a NEMA4 type water proof cabinet.
2. The battery system shall be contained in a NEMA4 type water proof cabinet.
3. The system shall include automatic alarming of malfunctions of the signal booster and battery system. Any resulting trouble alarm shall be automatically transmitted to an approved central station or proprietary supervising station as defined in NFPA 72 or, when approved by the fire code official, shall sound an audible signal at a constantly attended location.
4. Equipment shall have FCC Certification prior to installation.

I103.2.5 Additional frequencies and change of frequencies. The emergency responder radio coverage system shall be capable of modification or expansion in the event frequency changes are required by the FCC or additional frequencies are made available by the FCC.

I103.3 Installation requirements. The installation of the public safety radio coverage system shall be in accordance with Sections I103.3.1 through I103.3.5.

I103.3.1 Approval prior to installation. No amplification system capable of operating on frequencies licensed to any public safety agency by the FCC shall be installed without prior coordination and approval of the fire code official.

I103.3.2 Permit required. A construction permit as required by Section 105.7.11 shall be obtained prior to the installation of the emergency responder radio coverage system.

I103.3.3 Minimum qualifications of personnel. The minimum qualifications of the system designer and lead installation personnel shall include:

1. A Valid FCC issued General Radio Operators License, and
2. Certification of in-building system training issued by a nationally recognized organization, school or a certificate issued by the manufacturer of the equipment being installed.

The agency may waive these requirements upon successful demonstration of adequate skills and experience satisfactory to the fire code official.

I103.3.4 Acceptance test procedure. When an emergency responder radio coverage system is required, and upon completion of installation, the building owner shall have the radio system tested to ensure that two-way coverage on each floor of the building is a minimum of 90 percent. The test procedure shall be conducted as follows:

1. Each floor of the building shall be divided into a grid of 20 approximately equal areas.
2. The test shall be conducted using a calibrated portable radio of the latest brand and model used by the agency talking through the agency's radio communications system.
3. A maximum of two nonadjacent areas will be allowed to fail the test.
4. In the event that three of the areas fail the test, in order to be more statistically accurate, the floor may be divided into 40 equal areas. A maximum of four nonadjacent areas will be allowed to fail the test. If the system fails the 40-area test, the system shall be altered to meet the 90 percent coverage requirement.
5. A test location approximately in the center of each grid area will be selected for the test, then the radio will be enabled to verify two-way communications to and from the outside of the building through the public agency's radio communications system. Once the test location has been selected, that location shall represent the entire area. If the test fails in the selected test location, that grid area shall fail, and prospecting for a better spot within the grid area will not be allowed.
6. The gain values of all amplifiers shall be measured and the test measurement results shall be kept on file with the building owner so that the measurements can be verified during annual tests. In the event that the measurement results become lost, the building owner will be required to rerun the acceptance test to reestablish the gain values.
7. As part of the installation a spectrum analyzer or other suitable test equipment shall be utilized to insure spurious oscillations are not being generated by the subject signal booster. This test will be conducted at time of installation and subsequent annual inspections.

I103.3.5 FCC compliance. The emergency responder radio coverage system installation and components shall also comply with all applicable Federal regulations, including but not limited to, Federal Communications Rules (47 CFR 90.219).

I103.4 Maintenance. The emergency responder radio coverage system shall be maintained in accordance with Sections I103.4.1 through I103.4.5.

I103.4.1 Maintenance. The public radio coverage system shall be maintained operational at all times.

I103.4.2 Permit required. A permit as required by Section 105.7.4 shall be obtained prior to the modification or alteration of the emergency responder radio coverage system.

I103.4.3 Testing and proof of compliance. The emergency responder radio coverage system shall be inspected and tested annually or whenever structural changes occur including additions or remodels that could materially change the original field performance tests. Testing shall consist of the following:

1. In-building coverage test as described in Section I103.3.4.
2. Signal boosters shall be tested to ensure that the gain is the same as it was upon initial installation and acceptance.
3. Backup batteries and power supplies shall be tested under load of a period of one hour to verify that they will properly operate during an actual power outage. If within the one hour test period the battery exhibits symptoms of failure, the test shall be extended for additional one hour periods until the integrity of the battery can be determined.
4. All other active components shall be checked to verify operation within the manufacturer's specifications.
5. At the conclusion of the testing a report shall be submitted to the fire code official which shall verify compliance with Section I103.3.4.

I103.4.4 Additional frequencies. The building owner shall modify or expand the emergency responder radio coverage system at their expense in the event frequency changes are required by the FCC or additional frequencies are made available by the FCC. Prior approval of a public safety radio coverage system on previous frequencies does not exempt this section.

I103.4.5 Field testing. Agency personnel shall have the right to enter onto the property at any reasonable time to conduct field-testing to verify the required level of radio coverage.

Reason: Large buildings have historically provided barriers to radio communications within them. This is the reason high rise buildings are required to install hard wired, two-way communications systems. The typical system has phone jacks strategically located throughout the building (in stairways, elevator lobbies, and inside elevators), with hand sets available to emergency responders in the lobby or the fire control room. However, problems with this solution include:

- Handset availability – even if they don't get stolen or misplaced, the typical building will only have five handsets, far too few for the dozens to hundreds of firefighters required to successfully bring a high rise fire under control
- Lack of training for responders – while some fire departments routinely train on these systems, each one is different, presenting problems remembering the special considerations necessary to operate successfully in each high rise building; other responders (law enforcement, EMS) don't train on these systems at all, and many times don't even know they exist
- Buildings other than high-rise interfere with routine radio communications, but aren't required to provide an alternative.

When this requirement was implemented, it was the best alternative available. Now, technology has progressed to a point where there are multiple solutions with multiple technologies to address virtually any situation. These solutions support emergency responders' radio systems so that no additional training is required by the responders; the same communication system that they use every day can be used in any building in a jurisdiction.

Emergency response agencies use radio communications routinely and lives depend on the adequacy of the radio communication system. Communications must be able to go both into and out of the buildings in times of emergency. Whether it be someone inside the building requesting assistance, or even worse calling May Day, or the Incident Commander outside the building trying to obtain a status report to make a determination on deployment of additional resources, communications is critical.

Some will complain of the cost of these systems, which range from the relatively inexpensive to very expensive, depending upon the solution chosen by the building owner or developer (one estimate is from \$.40/ft to \$1.25/ft). The fact is that tax payers have invested billions of dollars in their public safety communications systems. It isn't unusual for a mid-size jurisdiction to spend millions of dollars to equip emergency responders with communications systems, only to have a developer construct a building that defeats the entire system inside their facility. Good public policy dictates that these owners/developers bear the cost of upgrading their facilities to allow emergency responders to utilize the tools that tax payers have provided. This is in keeping with the philosophy inherent in the I-Codes that, when a facility grows too large or complex for effective fire response, that fire protection features be provided within the building at the owner's expense.

This proposal provides that an adequate level of communication is available within the building. Once a deficiency is noted in a building, the installation and technical criteria in Appendix I can be utilized to design and install a system to enhance the radio communications. There are several types of systems that can be utilized to enhance radio traffic and under this proposal any of these systems can be used.

This proposal also includes existing buildings in Section 511.2. While modeling and other techniques may provide a good prediction as to whether a building will interfere with radio communications, the reality is that it is unknown if a building will need to install any type of radio system enhancements until after the building is constructed. These issues are dependent on the construction type, shadows of other buildings, size of structure, etc. This proposal includes existing structures so that once the building is built, the system can be installed at any time, when and if it becomes necessary; it also provides a reasonable amount of time for existing buildings to come into conformance (18 months after notification).

The proposed Appendix I includes design, construction, maintenance and testing criteria. This provides guidance to the code official and ensures that the emergency responder radio coverage system will be operational throughout the life of the building.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing Results

Committee Action:**Approved as Submitted**

Committee Reason: The proposal was approved because the committee felt that it has merit and would resolve a serious and long-standing issue in fire department operational efficiency and safety. The committee indicated, however, that there are substantial issues which need to be resolved, including, but not limited to: applicability to "all" buildings would be unreasonable; the application to existing buildings would be onerous; there is no exception for single family residences; deleting the fire department communications system would eliminate a useful backup system; the title phrase "emergency responder" could lead to demands for other municipal departments that use radios to be provided with such a system; and technical requirements should not be relegated to an appendix. The committee expressed its hope that the continuing work on this topic by the ICC Code Technology Committee and the JFSRC would resolve the concerns.

Assembly Action:**None**

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because public comments were submitted.

Public Comment 1:

Paul K. Heilstedt, PE, FAIA, Chair, ICC Code Technology Committee, (CTC), requests Approval as Modified by this public comment.

Tom Lariviere, Chair, ICC Joint Fire Service Review Committee (JFSRC), requests Approval as Modified by this public comment.

John Dean, representing the National Association of State Fire Marshals (NASFM), requests Approval as Modified by this public comment.

Sean DeCrane, representing the International Association of Fire Fighters (IAFM), requests Approval as Modified by this public comment.

Jack Murphy, representing the Fire Safety Directors of Greater New York, requests Approval as Modified by this public comment.

Modify proposal as follows:

511.1 Emergency responder radio coverage in new buildings. All new buildings shall have approved radio coverage for emergency responders within the building based upon the existing coverage levels of the public safety communication systems of the jurisdiction at the exterior of the building. This section shall not require improvement of the existing public safety communication systems.

Exceptions:

1. Where approved by the building code official and the fire code official, a wired communication system shall be permitted to be installed or maintained in lieu of an approved radio coverage system.
2. Where it is determined by the fire code official that the radio coverage system is not needed.

511.2 Radio signal strength. The building shall be considered to have acceptable emergency responder radio coverage when signal strength measurements in 95 percent of all areas on each floor of the building meet the signal strength requirements in items 511.2.1 and 511.2.2.

511.2.1 Minimum signal strength into the building. A minimum signal strength of -95 dBm shall be receivable within the building.

511.2.2 Minimum signal strength out of the building. A minimum signal strength of -100 dBm shall be received by the agency's radio system when transmitted from within the building.

511.2- 511.3 Emergency responder radio coverage in existing buildings. Existing buildings that do not have approved radio coverage for emergency responders within the building shall be equipped with such coverage according to one of the following: ~~within 18 months of receiving notice of such deficiency from the fire code official.~~

1. Wherever existing wired communication system cannot be repaired or is being replaced, or where not approved in accordance with Section 511.1 Exception 1.
2. Within a time frame established by the adopting authority.

907.2.12.2 (IBC [F] 907.2.12.2) (Supp) Fire department communication system. ~~An approved emergency responder radio coverage system shall be provided for fire department use. It shall operate between a fire command center complying with Section 509 and elevators, elevator lobbies, emergency and standby power rooms, fire pump rooms, areas of refuge and inside enclosed exit stairways. Where a wired communications system is approved in lieu of a radio coverage system in accordance with section 511, the wired fire department communications systems shall be designed and installed in accordance with NFPA 72 and shall operate between a fire command center complying with Section 509, elevators, elevator lobbies, emergency and standby power rooms, fire pump rooms, areas of refuge and inside enclosed exit stairways. The fire department communication device shall be provided at each floor level within the enclosed exit stairway.~~

APPENDIX I
EMERGENCY RESPONDER RADIO COVERAGE

SECTION I103
TECHNICAL REQUIREMENTS

~~I103.1 Radio signal strength.~~ The building shall be considered to have acceptable emergency responder radio coverage when signal strength measurements in 90 percent of all areas on each floor of the building meet the signal strength requirements in Sections I103.1.1 and I103.1.2.

~~I103.1.1 Minimum signal strength into the building.~~ A minimum signal strength of -95 dBm shall be receivable within the building.

~~I103.1.2 Minimum signal strength out of the building.~~ A minimum signal strength of -100 dBm shall be received by the agency's radio system when transmitted from within the building.

(Renumber subsequent sections.)

(Portions of Appendix I of the proposal not shown remain unchanged.)

~~Commenter's Reason:~~ The CTC also proposed a code change to address repeaters in F171 – 07/08. The CTC prefers F87 and has worked with the proponent in developing a public comment to clarify the provisions for new and existing buildings.

~~511.1:~~ This section has been clarified to note that the existing coverage levels at the building (not in the building) need not be upgraded as a result of the need for coverage in the building. The purpose of the radio coverage in the building is to take the existing signal outside the building and amplify it. The exceptions provide an option for wired systems as an alternative and also if it is determined by the fire code official that emergency coverage is not needed, then it need not be provided. Obviously, both of these exceptions will require that the code official be consulted by the design professional.

There are two reasons for leaving an exception for the wired systems. One is because some fire service representatives have asked for the option to be there so they can make the decision whether or not to deal with the radio repeater system. Note that it is not automatically available, only if approved, so in your jurisdiction you won't have to approve it. The other reason for the wired option is because there are situations where you cannot solve the problem with radio repeater technology because the space is designed to prevent any radio waves from getting in or out, (lead shielding for example), in those cases the ability will exist for the local code officials to approve, (actually to require as well), a wired system if they agree it is the proper method for that space.

~~511.2:~~ The provisions for signal strength are viewed as critical and need to be uniformly applied. As such, they have been relocated from the proposed appendix and incorporated into the body of the code.

~~511.3:~~ There is clearly a need for existing buildings to be provided with coverage. However, requiring an existing wired system to be updated within 18 months when the system is operational or can be repaired is viewed as excessive. Further, an 18 month threshold is rather arbitrary and really should be left up to the adopting authority to decide the time frame for compliance for existing buildings.

~~907.2.12.2:~~ This comment is intended to clarify where wired systems are provided and approved, it can be used in lieu of a radio system and provides the technical language concerning how the system is to be installed.

Code issues are assigned to the CTC by the ICC Board as "areas of study". Information on the CTC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CTC effort can be downloaded from the following website: <http://www.iccsafe.org/cs/cc/ctc/index.html>. Since its inception in April/2005, the CTC has held fifteen meetings - all open to the public. This public comment is a result of the CTC's investigation of the area of study entitled "NIST World Trade Center Recommendations". The CTC web page for this area of study is: <http://www.iccsafe.org/cs/cc/ctc/WTC.html>

Final Hearing Results

F87-07/08

AMPC1

Code Change No: **F89-07/08**

Original Proposal

Sections: 604.2.15.1.3, 604.2.15.3, IBC [F] 403.10.2, IBC [F] 403.11.1

Proponent: James C. Gerren, Clark County, NV Department of Development Services

1. Revise as follows:

604.2.15.1.3 Connected facilities. Power and lighting facilities for the fire command center and elevators specified in Sections 403.8 and 403.9 of the *International Building Code*, as applicable, ~~and electrically powered fire pumps required to maintain pressure,~~ shall be transferable to the standby source. Standby power shall be provided for at least one elevator to serve all floors and be transferable to any elevator.

604.2.15.3 Emergency systems. Exit signs, exit illumination as required by Chapter 10, electrically powered fire pumps required to maintain pressure, and elevator car lighting are classified as emergency systems and shall operate within 10 seconds of failure of the normal power supply and shall be capable of being transferred to the standby source.

Exception: Exit sign, exit and means of egress illumination are permitted to be powered by a standby source in buildings of Group F and S occupancies.

2. Revise IBC as follows:

[F] 403.10.2 Standby power loads. The following are classified as standby power loads:

1. Power and lighting for the fire command center required by Section 403.8; and
- ~~2. Electrically powered fire pumps; and~~
- ~~3. 2. Ventilation and automatic fire detection equipment for smokeproof enclosures.~~

Standby power shall be provided for elevators in accordance with Sections 1007.4 and 3003.

[F] 403.11.1 Emergency power loads. The following are classified as emergency power loads:

1. Exit signs and means of egress illumination required by Chapter 10;
2. Elevator car lighting;
3. Emergency voice/alarm communications systems;
4. Automatic fire detection systems; and
5. Fire alarm systems.
6. Electrically powered fire pumps.

Reason: The purpose of the proposed change is to clarify the code.

Section 9.6.2.1 of NFPA 20 (2003 edition), Standard for the Installation of Stationary Pumps for Fire Protection, requires on-site generators that are used to supply alternate power to electric motor-driven fire pumps to meet the requirements of Level 1, Type 10, Class X emergency power supply systems (EPSSs) of NFPA 110, Standard for Emergency and Standby Power Systems. NFPA 110 (2005 edition), Table 4.1(b) requires Type 10 EPSSs to restore power within 10 seconds. Since standby power is required to be available within 60 seconds, it is not appropriate to include electrically powered fire pumps in the list of standby power loads. Accordingly, the proposed code change would move electrically powered fire pumps from the list of standby power loads in Section 604.2.15.1.3 and IBC [F] 403.10.2 to the list of emergency power loads in Section 604.2.15.3 and IBC [F] 403.11.1.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The proposal was approved because the committee felt that it will provide correlation with the referenced standard, NFPA 20.

Assembly Action:

None

Final Hearing Results

F89-07/08

AS

Code Change No: **F116-07/08**

Original Proposal

Table 803.3; IBC Table 803.9

Proponent: Tom Lariviere, Fire Department, Madison, MS, representing Joint Fire Service Review Committee

THESE PROPOSALS ARE ON THE AGENDA OF THE IFC AND THE IBC FIRE SAFETY CODE DEVELOPMENT COMMITTEES AS 2 SEPARATE CODE CHANGES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IFC

Revise table as follows:

**TABLE 803.3
INTERIOR WALL AND CEILING FINISH REQUIREMENTS BY OCCUPANCY^k**

Group	Sprinklered ^l			Nonsprinklered		
	Exit enclosures and exit passageways ^{a,b}	Corridors	Rooms and enclosed spaces ^c	Exit enclosures and exit passageways ^{a,b}	Corridors	Rooms and enclosed spaces ^c
B, E, M, R-1, R-4	B	C	C	A	B	C
<u>R-4</u>	<u>B</u>	<u>C</u>	<u>C</u>	<u>A</u>	<u>B</u>	<u>B</u>

(Portions of table and footnotes not shown remain unchanged)

PART II – IBC FIRE SAFETY

Revise table as follows:

**TABLE 803.9 (Supp)
INTERIOR WALL AND CEILING FINISH REQUIREMENTS BY OCCUPANCY^k**

Group	Sprinklered ^l			Nonsprinklered		
	Exit enclosures and exit passageways ^{a,b}	Corridors	Rooms and enclosed spaces ^c	Exit enclosures and exit passageways ^{a,b}	Corridors	Rooms and enclosed spaces ^c
B, E, M, R-1, R-4	B	C	C	A	B	C
<u>R-4</u>	<u>B</u>	<u>C</u>	<u>C</u>	<u>A</u>	<u>B</u>	<u>B</u>

(Portions of table and footnotes not shown remain unchanged)

Reason: Table 803.3 in the IFC governs wall and ceiling finish in existing buildings. Table 803.3 in the IBC governs wall and ceiling finish in new buildings.

The change that occurs in this proposal is to increase the flame spread rating from Class C to Class B in rooms and areas within Group R-4 occupancies. These occupancies house clients that in many cases need assistance to evacuate. The increased level of safety afforded by requiring a Class B rating will provide additional time for evacuation before the room is totally involved in fire.

This proposal is consistent with Federal regulations for board and care facilities.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing Results

PART I – IFC

Committee Action:

Disapproved

Committee Reason: The proposal was disapproved because the committee had several concerns with the proposal, including that federal licensing requirements should remain a choice, not an IFC mandate because the code cannot accommodate widely varying licensure requirements. Also, changing the class of interior finish for non-sprinklered Group R-4 in the proposal would be in conflict with the IBC interior finish requirements for new buildings. Applying the provisions to existing buildings would create an undue burden in requiring changes to existing interior finishes.

Assembly Action:

None

**PART II – IBC FIRE SAFETY
Committee Action:**

Approved as Submitted

Committee Reason: The committee agreed that it was appropriate for the allowable flame spread index in Group R-4, interior wall and ceiling finishes, to be reduced in some instances. Occupants with Group R-4 in many cases need assistance to evacuate. The increased level of safety afforded by requiring a lower maximum flame spread index (Class B rating) provides additional time for evacuation of the structure.

Assembly Action:

None

Final Hearing Results

F116-07/08, Part I	D
F116-07/08, Part II	AS

Code Change No: F120-07/08

Original Proposal

Sections: 804.1; IBC [F] 806.5**Proponent:** Douglas H. Evans, PE, Department of Development Services, Clark County, NV**1. Revise IFC as follows:**

804.1 (Supp) Interior trim. Material, other than foam plastic, used as interior trim shall have a minimum Class C flame spread index and smoke-developed index, when tested in accordance with ASTM E 84, as described in Section 803.1.1. Combustible trim, excluding handrails and guardrails, shall not exceed 10 percent of the specific wall or ceiling areas ~~in to~~ which it is ~~located~~ attached.

2. Revise IBC as follows:

[F] 806.5 (Supp) Interior trim. Material, other than foam plastic used as interior trim shall have a minimum Class C flame spread and smoke-developed index when tested in accordance with ASTM E 84 or UL 723, as described in Section 803.1. Combustible trim, excluding handrails and guardrails, shall not exceed 10 percent of the aggregate specific wall or ceiling area ~~in to~~ which it is ~~located~~ attached.

Reason: If one reads the code literally, 10 percent all the allowable decorative wall materials may be placed on a single wall, which may actually allow the quantity of decorative materials to exceed the size of a specific wall. The proposed revision limits the percentage of decorative material to the respective wall.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Modified

Modify the proposal as follows:

804.1 (Supp) Interior trim. Material, other than foam plastic, used as interior trim shall have a minimum Class C flame spread index and smoke-developed index, when tested in accordance with ASTM E 84 or UL 723, as described in Section 803.1.1. Combustible trim, excluding handrails and guardrails, shall not exceed 10 percent of the specific wall or ceiling areas to which it is attached.

(Portions of proposal not shown remain unchanged)

Committee Reason: The proposal was approved because the committee felt that it will provide better control of the fire load of interior finishes. The committee did express a concern that the retroactive provisions of the IFC should recognize that there may be previously approved applications based on the IBC's "aggregate" wall or ceiling area. The modification provides correlation with IBC Section [F] 806.5 and other sections that reference both ASTM E 84 and UL 723 as a result of the approval of code change FS11-06/07 in the last cycle.

Assembly Action:

None

Final Hearing Results

F120-07/08

AM

Code Change No: **F121-07/08**

Original Proposal

Sections: 804.2.3 (IBC [F] 2604.2.3)

Proponent: Douglas H. Evans, PE, Department of Development Services, Clark County, NV

Revise as follows:

804.2.3 (IBC [F] 2604.2.3) (Supp) Area limitation. The interior trim shall not constitute more than 10 percent of the specific wall or ceiling areas of a room or space to which it is attached.

Reason: First of all, the code is inconsistent. Sometimes it specifies walls and ceilings and sometimes walls or ceilings. This revision can be looked at partially as clarification.

Most importantly, imagine a 100,000 sq ft casino, convention center or ballroom with 30 foot high walls (this is not uncommon). Within the other limitations specified in this section, a substantial quantity of decorative foam plastic materials may be installed on a single wall or ceiling. For the 100,000 sq ft example specified, that could allow in excess of 13,000 sq ft of decorative combustible foam plastic "trim".

Cost Impact: The code change proposal will increase the cost of construction and should not affect most applications

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The proposal was approved as Submitted for consistency with the action taken on code change F120-07/08.

Assembly Action:

None

Final Hearing Results

F121-07/08

AS

Code Change No: **F128-07/08**

Original Proposal

Sections: 807.1.2 (IBC [F] 806.1.2)

Proponent: Douglas H. Evans, PE, Department of Development Services, Clark County, NV

Revise as follows:

807.1.2 (IBC [F] 806.1.2) Combustible decorative materials. The permissible amount of decorative materials meeting the flame propagation performance criteria of NFPA 701 shall not exceed 10 percent of the aggregate area of specific walls and ceilings wall or ceiling area to which it is attached.

Exceptions:

1. In auditoriums in Group A, the permissible amount of decorative material meeting the flame propagation performance criteria of NFPA 701 shall not exceed ~~50~~ 75 percent of the aggregate wall ~~area of walls and ceiling~~ where the building is equipped throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.1, and where the material is installed in accordance with Section 803.4 of the *International Building Code*.
2. The amount of fabric partitions suspended from the ceiling and not supported by the floor in Group B and M occupancies shall not be limited.

Reason: First of all, the code is inconsistent. Sometimes it specifies walls and ceilings and sometimes walls or ceilings. This revision can be looked at partially as clarification.

Most importantly, imagine a 100,000 sq ft casino, convention center or ballroom with 30 foot high walls (this is not uncommon). If one reads the code literally, this section allows all the decorative materials to be placed in a single location. This could allow draperies or other combustible features to be well in excess of the entire wall area. For the 100,000 sq ft example specified, that could allow in excess of 13,000 sq ft of decorative combustible applications in a single location.

The change to Exception 1 clarifies that the surface being considered is the walls and not the ceiling. In most cases, 50 percent of the walls and ceiling area will exceed 75 percent of the wall area. As such, the proposed amendment will be more conservative (and more specific), while still allowing draperies in theaters to cover a substantial portion of the walls.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:**Approved as Submitted**

Committee Reason: The proposal was approved as Submitted for consistency with the actions taken on code changes F120- and F121-07/08.

Assembly Action:**None**

Final Hearing Results

F128-07/08

AS

Code Change No: **F132-07/08**

Original Proposal

Sections: 903.2.1.3, 903.2.1.4 (IBC [F] 903.2.1.3, [F] 903.2.1.4)

Proponent: Tom Lariviere, Fire Department, Madison, MS, representing Joint Fire Service Review Committee

Revise as follows:

903.2.1.3 (IBC [F] 903.2.1.3) Group A-3. An automatic sprinkler system shall be provided for Group A-3 occupancies where one of the following conditions exists:

1. The fire area exceeds 12,000 square feet (1115 m²);
2. The fire area has an occupant load of 300 or more; or
3. The fire area is located on a floor other than the level of exit discharge.

Exception: ~~Areas used exclusively as participant sports areas where the main floor area is located at the same level as the level of exit discharge of the main entrance and exit.~~

903.2.1.4 (IBC [F] 903.2.1.4) Group A-4. An automatic sprinkler system shall be provided for Group A-4 occupancies where one of the following conditions exists:

1. The fire area exceeds 12,000 square feet (1115 m²);
2. The fire area has an occupant load of 300 or more; or
3. The fire area is located on a floor other than the level of exit discharge.

Exception: ~~Areas used exclusively as participant sports areas where the main floor area is located at the same level as the level of exit discharge of the main entrance and exit.~~

Reason: The intention of the exception was for gymnasiums and similar areas where the probable occupant load was significantly less than what would be determined based on a square footage per occupant factor. These facilities have become multi-use and the occupant load is frequently higher than what was anticipated or expected when the exception was developed, and the fire load can vary based on the used to far exceed what would be expected for a sporting area.

For example, a community recreation center is constructed with no sprinklers over the gymnasium floor. The same area is also utilized for receptions and various community activities such as work fairs, rummage sale, art exhibits, emergency shelters for persons displaced by natural disasters, etc. Such uses could even include eating, sleeping, and fire loads far in excess of a few uniforms and leather volleyballs.

Cost Impact: Since the rest of the building will be sprinklered, the additional cost is only for additional sprinkler lines.

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The proposal was disapproved because the committee felt that the current exception that is aimed at limited-use facilities is needed and that the "exclusive" use of the area for participant sports is the key to successful application and must be strictly enforced by the fire code official at the outset of a project. Changes to the use of the area after occupancy should be reviewed as an illegal change in use that must be regulated.

Assembly Action:

None

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Tom Lariviere, Fire Department, Madison, MS, representing Joint Fire Service Review Committee, requests Approval as Submitted.

Commenter-s Reason: This public comment allows for the facility to be construction without any restrictions on use or the need for the local fire code official to track each and every event in each and every location where this exception was utilized within the jurisdiction.

The intention of the exception was for gymnasiums and similar areas where the probable occupant load was significantly less than what would be determined based on a square footage per occupant factor. These facilities have become multi-use and the occupant load is frequently higher than what was anticipated or expected when the exception was developed, and the fire load can vary based on the used to far exceed what would be expected for a sporting area.

For example, a community recreation center is constructed with no sprinklers over the gymnasium floor. The same area is also utilized for receptions and various community activities such as work fairs, rummage sale, art exhibits, emergency shelters for persons displaced by natural disasters, etc. Such uses could even include eating, sleeping, and fire loads far in excess of a few uniforms and leather volleyballs.

Final Hearing Results

F132-07/08

AS

Code Change No: F133-07/08

Original Proposal

Sections: 903.2.2 (IBC [F] 903.2.2)

Proponent: Jeff Hugo, National Fire Sprinkler Association

Revise as follows:

903.2.2 (IBC [F] 903.2.2) (Supp) Group E. An automatic sprinkler system shall be provided for Group E occupancies as follows:

1. Throughout all Group E fire areas greater than ~~20,000~~ 12,000 square feet (~~1858~~ 1115 m²) in area.
2. Throughout every portion of educational buildings below the lowest level of exit discharge that serves that portion of the building.

Exception: An automatic sprinkler system is not required in any fire area or area below the level of exit discharge where every classroom throughout the building has at least one exterior exit door at ground level.

Reason: The continuity of mission is important for educational occupancies. If a community loses a school that community cannot quickly recover to resume normal school activities. There are several similarities between educational and several other occupancies, therefore sprinkler requirements should also be similar. Reducing the fire area from 20,000 s.f. to 12,000 s.f. will aid in fire fighter rescue, smaller area of damage, and a quicker recovery to school programs if a sprinkler system is not chosen. Although through consistent fire drills, deaths are rare, but the possibility exists for a large loss of life in educational occupancies. A threshold of 20,000 square feet is one of the highest minimum sprinkler thresholds in the code and exists without good reason. Some states have already mandated complete sprinkler protection in educational occupancies.

In most cases it is not economically feasible to build a school without sprinkler protection. The cost savings for a community to build a school is introduced when the decision to install sprinklers is done at the early stages of the project where they can take advantage of the sprinkler trade ups for building construction. Another factor to consider is federal, state, and local tax monies available to build and repair schools. A fire sprinkled school will cost less to insure, less to rebuild, less liability to the school system, less injuries, less taxes, and less downtime. According to statistics only 24% of the nation's schools have fire sprinklers. However the average fire loss when sprinklers are present are \$2,800 versus \$12,900 having no sprinklers, resulting in a 78% reduction in damage.

Fires during lockdowns, hostage, or terrorist events are now a concern than during the legacy codes where the 20,000 s.f. threshold evolved from. A fire during a lockdown is a lose-lose event for the administrators' and children. Fire sprinklers can control the fire during the lockdown in lieu of endangering the children exiting during the lockdown or prohibiting egress caused by the fire.

Statistics from a four year period of 1999-2002, there were an estimated average of 7,070 structure fires in educational occupancies along with 113 injuries and \$112 million in property damage. K-12 schools make up 5,230 fires, 88 injuries, and \$74 million in fire damage. This is money from the taxes we pay, and these are our children getting burned and injured. Fire sprinklers can reduce the cost while increasing fire protection. Including fire sprinklers during the design process can significantly reduce the construction cost.

Bibliography:

EDUCATIONAL PROPERTIES, National Fire Protection Association, September 2006

Practical Information on Crisis Planning: A Guide for Schools and Communities, US Dept of Education, Jan. 2007

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The proposal was approved because the committee agreed that the proponent's reason statement accurately and adequately substantiates the need for the change, which will provide increased life safety and property protection in buildings that are an essential part of a community. Whereas several previous proposals sought to sprinker all schools without exception, this proposal includes a reduced but reasonable threshold that is similar to other sprinkler thresholds in Section 903.

Assembly Action:

None

Final Hearing Results

F133-07/08

AS

Code Change No: F135-07/08

Original Proposal

Sections: 903.2.6 (IBC [F] 903.2.6)

Proponent: Jesse J. Beitel, Hughes Associates, Inc., representing American Home Furnishings Alliance and National Home Furnishings Association

Revise as follows:

903.2.6 (IBC [F] 903.2.6) Group M. An automatic sprinkler system shall be provided throughout buildings containing a Group M occupancy where one of the following conditions exists:

1. Where a Group M fire area exceeds 12,000 square feet (1115 m²);
2. Where a Group M fire area is located more than three stories above grade plane; ~~or~~
3. Where the combined area of all Group M fire areas on all floors, including any mezzanines, exceeds 24,000 square feet (2230 m²); ~~or~~
4. Where a Group M occupancy is used primarily for the display and sale of upholstered furniture.

Reason: This proposal is submitted jointly by the American Home Furnishings Alliance (AHFA) and the National Home Furnishings Association (NHFA) in the interest of making furniture retail and warehouse facilities safer for employees, customers and first responders. AHFA represents manufacturers and importers of residential furniture, some of whom also operate branded retail stores. NHFA's membership comprises 2,800 corporate entities representing 10,000 retail furniture stores in all 50 states and several foreign countries.

The proposal to require sprinklers for Group M occupancies containing significant amounts of upholstered furniture recognizes that, under certain circumstances, all upholstered furniture will ignite and contribute to the fuel load of a fire. There is no such thing as totally fire safe upholstered furniture.

The AFHA and the NHFA have examined proposals for exempting vendors of certain constructions of furniture and concluded that such exemptions would be impractical for local code officials to enforce. This is the case because the internal construction of furniture cannot be established reliably without deconstructing it.

Further, materials and constructions touted as more fire resistant have not proven so to the satisfaction of fire authorities. The U.S. Consumer Product Safety Commission (CPSC) has tested furniture with combustion modified polyurethane foam such as that required in California and the United Kingdom and found that such foam does not meaningfully improve fire performance when furniture is exposed to an open flame. Other researchers have found that constructions employing the fire-blocking barriers now prevalent in mattresses do not reliably slow the progression of furniture fires. This is likely due to the variety of upholstery fabrics and seating geometries typical of furniture as compared to mattresses.

The most protective code measure would establish uniform, easily enforceable sprinkler requirements and not base safety considerations on differences in furniture construction that may or may not exhibit better fire performance in a retail setting.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Modified

Modify the proposal as follows:

903.2.6 (IBC [F] 903.2.6) Group M. An automatic sprinkler system shall be provided throughout buildings containing a Group M occupancy where one of the following conditions exists:

1. Where a Group M fire area exceeds 12,000 square feet (1115 m²);
2. Where a Group M fire area is located more than three stories above grade plane;
3. Where the combined area of all Group M fire areas on all floors, including any mezzanines, exceeds 24,000 square feet (2230 m²); ~~or~~
4. Where a Group M occupancy is used ~~primarily~~ for the display and sale of upholstered furniture.

Committee Reason: The proposal was approved because the committee felt that it is a good first step supported by the furniture industry in attempting to deal with the hazards presented by upholstered furniture. The committee indicated its sense that future efforts on the topic need to address Group F and S upholstered furniture occupancies as well and that a reasonable sprinkler threshold needs to be added to provide some relief to the small businesses that will now be affected. The modification removes a subjective term that the committee felt could create serious enforcement inconsistencies.

Assembly Action:

None

Final Hearing Results

F135-07/08

AM

Code Change No: F136-07/08

Original Proposal

Sections: 903.2.8, 903.2.8.1, 903.2.9 (IBC [F] 903.2.8, [F] 903.2.8.1, [F] 903.2.9)

Proponent: Tom Lariviere, Fire Department, Madison, MS, representing Joint Fire Service Review Committee

Revise as follows:

903.2.8 (IBC [F] 903.2.8) Group S-1. An automatic sprinkler system shall be provided throughout all buildings containing a Group S-1 occupancy where one of the following conditions exists:

1. A Group S-1 fire area exceeds 12,000 square feet (1115 m²);
2. A Group S-1 fire area is located more than three stories above grade plane; or
3. The combined area of all Group S-1 fire areas on all floors, including any mezzanines, exceeds 24,000 square feet (2230 m²).
4. A group S-1 fire area used for the storage of commercial trucks or buses where the fire area exceeds 5,000 square feet (464 m²).

903.2.8.1 (IBC [F] 903.2.8.1) (Supp) Repair garages. An automatic sprinkler system shall be provided throughout all buildings used as repair garages in accordance with Section 406 of the *International Building Code*, as shown:

1. Buildings having two or more stories above grade plane, including basements, with a fire area containing a repair garage exceeding 10,000 square feet (929 m²).
2. Buildings no more than one story above grade plane, with a fire area containing a repair garage exceeding 12,000 square feet (1115 m²).
3. Buildings with a repair garage servicing vehicles parked in the basement.
4. A group S-1 fire area used for the repair of commercial trucks or buses where the fire area exceeds 5,000 square feet (464 m²).

903.2.9 (IBC [F] 903.2.9) (Supp) Group S-2. An automatic sprinkler system shall be provided throughout buildings classified as enclosed parking garages in accordance with Section 406.4 of the *International Building Code* as follows.

1. Where the fire area of the enclosed parking garage exceeds 12,000 square feet (1115 m²); or
2. Where the enclosed parking garage is located beneath other groups.

~~**Exception:** Enclosed parking garages located beneath Group R-3 occupancies.~~

Reason: This proposal adds an additional trigger for sprinkler protection in repair garages. This is a logical alignment with Section 903.2.9.1. Currently, a building that stores trucks is required to be protected by a fire sprinkler system at 5,000 square feet but if trucks are repaired within the same building, the building can go up to 12,000 square feet. The addition of the term 'stored' within 903.2.8 has been added since a multi-purpose are used to store more than trucks, such as a fire station bay, is an S-1 rather than an S-2.

The removal of the exception to 903.2.9 is to add clarity. Group R-3 occupancies are required to be protected by a fire sprinkler system and the exception adds confusion.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Modified

Modify the proposal as follows:

903.2.9 (IBC [F] 903.2.9) (Supp) Group S-2. An automatic sprinkler system shall be provided throughout buildings classified as enclosed parking garages in accordance with Section 406.4 of the *International Building Code* as follows.

1. Where the fire area of the enclosed parking garage exceeds 12,000 square feet (1115 m²); or
2. Where the enclosed parking garage is located beneath other groups.

Exception: Enclosed parking garages located beneath Group R-3 occupancies.

(Portions of proposal not shown remain unchanged)

Committee Reason: The proposal was disapproved because the committee felt that it will provide fire protection for the more hazardous area of garages. The modification retains the exception because Group R-3 occupancies can be sprinklered with an NFPA 13D system which would not include the garages.

Assembly Action:

None

Final Hearing Results

F136-07/08

AM

Code Change No: **F138-07/08**

Original Proposal

Sections: 903.2.10, 903.2.12.1, 903.2.12.2, 903.2.13, Table 903.2.13 (IBC [F] 903.2.10, [F] 903.2.12.1, [F] 903.2.12.2, [F] 903.2.13, [F] Table 903.2.13)

Proponent: Daniel E. Nichols, PE, NY State Division of Code Enforcement and Administration

1. Revise as follows:

903.2.10 (IBC [F] 903.2.10) ~~Windowless stories in all occupancies~~ Specific buildings areas and hazards. In all occupancies an automatic sprinkler system shall be installed for building design or hazards in the locations set forth in Sections 903.2.10.1 through ~~903.2.10.1.3~~ 903.2.10.6.

Exception: Group R-3 and Group U.

2. Relocate sections and table as follows:

~~903.2.12.1~~ **903.2.10.4 (IBC [F] ~~903.2.12.1~~ [F] 903.2.10.4) Ducts conveying hazardous exhausts.** Where required by the *International Mechanical Code*, automatic sprinklers shall be provided in ducts conveying hazardous exhaust, flammable or combustible materials.

Exception: Ducts where the largest cross-sectional diameter of the duct is less than 10 inches (254 mm).

~~903.2.12.2~~ **903.2.10.5 (IBC [F] ~~903.2.12.2~~ [F] 903.2.10.5) Commercial cooking operations.** An automatic sprinkler system shall be installed in a commercial kitchen exhaust hood and duct system where an automatic sprinkler system is used to comply with Section 904.

~~903.2.13~~ **903.2.10.6 (IBC [F] ~~903.2.13~~ [F] 903.2.10.6) Other required suppression system.** In addition to requirements of 903.2, the provisions indicated in Table ~~903.2.13~~ 903.2.10 also require the installation of a suppression system for certain buildings and areas.

**TABLE 903.2.13 903.2.10 (IBC TABLE [F] ~~903.2.13~~ [F] 903.2.10)
ADDITIONAL REQUIRED FIRE-EXTINGUISHING SYSTEMS**

(No change to table contents)

Reason: At present both Section 903.2.10 and 903.2.12 identify “other” places where sprinkler protection is required. These 5 things are either based on an identifiable hazard of the activity or design. As compared to section 903.2.11 which is essentially a list of references to other provisions, these 5 are detailed in Section 903. The distinction between the items in 903.2.10 and .12 is artificial and unneeded. Further, the existing title of 903.2.10 – Windowless stories in all occupancies is misleading. Only subsection 903.2.10.1 addresses the windowless situation. The intent of this proposal is editorial. It results in the sprinkler requirement provisions of 903 to be in 4 rough categories: 1 – Based on occupancy; 2 – based on building design or feature; 3-reference to other section; 4 – during construction;

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:**Approved as Submitted****Committee Reason:** The proposal was approved because the committee felt that it provides a logical reorganization of the sections.**Assembly Action:****None**

Final Hearing Results

F138-07/08**AS**

Code Change No: F140-07/08

Original Proposal

Sections: 903.3.1.2 (IBC [F] 903.3.1.2)**Proponent:** Jeffrey M. Shapiro, PE, International Code Consultants, representing National Multi Housing Council**Revise as follows:**

903.3.1.2 (IBC [F] 903.3.1.2) NFPA 13R sprinkler systems. ~~Where allowed in buildings of In~~ Group R occupancies, up to and including four stories in height, automatic sprinkler systems shall be installed throughout in accordance with NFPA 13R.

Reason: The proposed change is intended to clarify application of the code with respect to NFPA 13R systems. The title of NFPA 13R is "Standard for the Installation of Sprinkler Systems in Residential Occupancies up to and Including Four Stories in Height," with the key word being "occupancies." Currently, Section 903.3.1.2, by referring to "buildings of Group R," implies that NFPA 13R systems would not be permitted in any portion of a mixed use occupancy, which is inappropriate. In a mixed use containing Group R, it is entirely appropriate to permit NFPA 13R as a basis for sprinkler protection in the residential portion of the building, as well as accessory uses within residential areas. Other areas are, however, be required to be protected in accordance with NFPA 13. The proposal makes this clear.

Note that Section 903.2.7 still requires fire sprinklers throughout all buildings with a Group R fire area, so by changing Section 903.3.1.2 to refer to "occupancies," there is no impact on the requirement that the entire building containing a Group R fire area must be sprinklered.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:**Disapproved**

Committee Reason: The proposal was disapproved because the committee disagreed that the proposal is a simple clarification and clean-up of the section and felt that there is also sufficient ambiguity in Section 903.3.1 and all of its subsections to create a need for a complete re-work of that section and all of its subsections. It was felt that this section could be viewed as a specific requirement that would override Section 903.3.1 which could be viewed as only the general requirement and that mixed uses could claim on that basis that non-residential parts of the building do not need to comply with NFPA 13. Based on the proposed wording, it was also felt that this revised section could mandate the use of NFPA 13R for all Group R occupancies

Assembly Action:**None**

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Jeffrey Shapiro, PE, International Code Consultants, representing National Multi Housing Council, requests Approval as Modified by this public comment.

Replace proposal with the following:

903.3.1 Standards. Sprinkler systems shall be designed and installed in accordance with Sections 903.3.1.1, unless otherwise permitted by Sections 903.3.1.2 or 903.3.1.3.

903.3.1.1 NFPA 13 sprinkler systems. Where the provisions of this code require that a building or portion thereof be equipped throughout with an automatic sprinkler system in accordance with this section, sprinklers shall be installed throughout in accordance with NFPA 13 except as provided in Section 903.3.1.1.1.

903.3.1.1.1 Exempt locations. Automatic sprinklers shall not be required in the following rooms or areas where such rooms or areas are protected with an approved automatic fire detection system in accordance with Section 907.2 that will respond to visible or invisible particles of combustion. Sprinklers shall not be omitted from any room merely because it is damp, of fire-resistance rated construction or contains electrical equipment.

1. Any room where the application of water, or flame and water, constitutes a serious life or fire hazard.
2. Any room or space where sprinklers are considered undesirable because of the nature of the contents, when approved by the fire code official.
3. Generator and transformer rooms separated from the remainder of the building by walls and floor/ceiling or roof/ceiling assemblies having a fire-resistance rating of not less than 2 hours.
4. Rooms or areas that are of noncombustible construction with wholly noncombustible contents.
5. Fire service access elevator machine rooms and machinery spaces.

903.3.1.2 NFPA 13R sprinkler systems. ~~Where allowed in buildings of Group R, up to and including four stories in height, a~~ Automatic sprinkler systems ~~shall be in Group R occupancies up to and including four stories in height shall be permitted to be~~ installed throughout in accordance with NFPA 13R.

903.3.1.2.1 Balconies and decks. Sprinkler protection shall be provided for exterior balconies, decks and ground floor patios of dwelling units where the building is of Type V construction, provided there is a roof or deck above. Sidewall sprinklers that are used to protect such areas shall be permitted to be located such that their deflectors are within 1 inch (25 mm) to 6 inches (152 mm) below the structural members and a maximum distance of 14 inches (356 mm) below the deck of the exterior balconies and decks that are constructed of open wood joist construction.

903.3.1.3 NFPA 13D sprinkler systems. ~~Where allowed,~~ Automatic sprinkler systems ~~installed~~ in one- and two-family dwellings shall be permitted to be installed throughout in accordance with NFPA 13D.

Commenter's Reason: The proposed revision addresses the request of the code development committee for a comprehensive cleanup of this section. Although our original intent was simply to clarify application of the code with respect to NFPA 13R systems, the committee made it clear that they wanted the whole section fixed. That has now been done.

Final Hearing Results

F140-07/08

AMPC

Code Change No: F144-07/08

Original Proposal

Sections: 903.3.1.3 (IBC [F] 903.3.1.3)

Proponent: Anthony C. Apfelbeck, City of Altamonte Springs, FL

Revise as follows:

903.3.1.3 (IBC [F] 903.3.1.3) NFPA 13D sprinkler systems. Where allowed, automatic sprinkler systems installed in one and two-family dwellings and townhouses shall be installed throughout in accordance with NFPA 13D.

Reason: This proposal clarifies that NFPA 13D systems are an appropriate application in the townhouse environment. A townhouse is defined as a "single-family dwelling" by the IBC and the IRC. IRC Section R317.2 further indicates, "Each townhouse shall be considered a separate building. . ." NFPA 13D's scope states, "This standard shall cover the design and installation of automatic sprinkler systems for protection against the fire hazards in one- and two-family dwellings and manufactured homes." NFPA 13D's definition of dwelling states, "Any building that contains not more than one or two dwelling units. . ." Therefore, since each townhouse is classified as a separate building designed under the IBC, IRC and 13D definitions, the 13D system is an appropriate level of protection for each townhouse.

There are also a number of practical applications that preclude the utilization of a 13R system in a townhouse environment without significant difficulty:

1. Since "townhomes" typically involve separate ownership of property and the units extent from "foundation to roof", a common 13R system piping supplying all units would necessitate a complex common ownership element shared between the differing property owners. A community association would need to be established in order to "own" the common element. This common element may also require recorded easement to access the system in each persons house.
2. This community association would need to maintain the 13R system since 13R systems require maintenance and inspections in accordance with NFPA 25. This would involve coordinated access to each property and a shared maintenance cost.
3. If an external bell or monitoring of the 13R system is required, this would necessitate a separate house electrical panel, again owned by a community association. This would create an ongoing expense of electrical service and maintenance/testing of a fire alarm monitoring panel, if present.
4. If monitoring of the 13R system is required, this would then mandate a method of transmission which may involve the added expense of phone lines to the community association. An easement may be needed to access the phone lines.

None of these issues are present when an NFPA 13D system is installed in a townhouse. Therefore, the 13D system is appropriate for the townhouse application.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The proposal was approved because the committee felt that it is consistent with the scope of NFPA 13D. It was pointed out, however, that the definition of "townhouse" in the IBC includes 3 or more attached dwelling units which differs from the term defined in the IRC. Some separation requirement could be added to this section to resolve that issue.

Assembly Action:

None

Final Hearing Results

F144-07/08

AS

Code Change No: F147-07/08

Original Proposal

Sections: 903.4.1 (IBC [F] 903.4.1)

Proponent: Steven L. Schoon, Golder Ranch Fire District, AZ, representing Arizona Fire Marshals Association

Revise as follows:

903.4.1 (IBC [F] 903.4.1) (Supp) Monitoring. Alarm, supervisory and trouble signals shall be distinctly different and shall be automatically transmitted to an approved ~~central station, remote supervising station or proprietary~~ supervising station or, when approved by the fire code official, shall sound an audible signal at a constantly attended location.

Exceptions:

1. Underground key or hub valves in roadway boxes provided by the municipality or public utility are not required to be monitored.
2. Backflow prevention device test valves located in limited area sprinkler system supply piping shall be locked in the open position. In occupancies required to be equipped with a fire alarm system, the backflow preventer valves shall be electrically supervised by a tamper switch installed in accordance with NFPA 72 and separately annunciated.

Reason: The proposed revision is for consistency with the code language found in the fire alarm system monitoring Section 907.7.5 (2007 Supplement to the IFC) Supervising Station is defined by the IFC and the wording of central station, remote supervising station or proprietary supervising station is not needed.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The proposal was approved because the committee felt that it removes unnecessary text.

Assembly Action:

None

Final Hearing Results

F147-07/08

AS

Code Change No: F157-07/08

Original Proposal

Sections: 905.3.3 (IBC [F] 905.3.3)

Proponent: Tom Lariviere, Fire Department, Madison, MS, representing Joint Fire Service Review Committee

Revise as follows:

905.3.3 (IBC [F] 905.3.3) (Supp) Covered mall buildings. A covered mall building shall be equipped throughout with a standpipe system where required by Section 905.3.1. Covered mall buildings not required to be equipped with a standpipe system by Section 905.3.1 shall be equipped with Class I hose connections connected to the automatic sprinkler system sized to deliver water at 250 gallons per minute (946.4 L/min) at the most hydraulically remote outlet hose connection while concurrently supplying the automatic sprinkler system demand. The standpipe system shall be designed to not exceed a friction loss of 50 pounds per square inch (345 kPa) with a flow of 250 gallons per minute (946.4 L/min) from the fire department connection to the hydraulically most remote hose connection. Hose connections shall be provided at each of the following locations:

1. Within the mall at the entrance to each exit passageway or corridor.
2. At each floor-level landing within enclosed stairways opening directly on the mall.
3. At exterior public entrances to the mall.
4. At other locations as necessary so that the distance to reach all portions of a tenant space or anchor store does not exceed 200 (60 960 mm) feet from a hose connection.

Reason: Design of standpipe systems need to have two parameters, flow and pressure. Currently, there is no residual design pressure as part of the requirement which, in turn, provides a discrepancy on what output pressure to a fire department standpipe pack will be. Additionally, this section provides for hose connections connected to a sprinkler system rather than a bona-fide standpipe system. A vast majority of these systems act as a manual wet system, requiring the fire department to pump the FDC. Since this section deals with is a sprinkler system with hose connections, it makes sense that the maximum pump pressure is 175 psi so there is not unneeded damage to the sprinkler heads.

Location of the standpipe connections is revised to take into account some of the vast and varying designs found in mall layouts. The design of a covered mall has its roots to the covering of a city street. Section 402 of the IBC is still based on this premise, noticeable by the 20 foot wide mall walkway, tenant separations, etc. The fire department hose connections required by the section are to allow the fire department to extinguish a fire within the building, independent of the height of the mall. The problem is that the current hose connections are predicated on the exiting requirements found in IBC Section 402. Section 402.4.4 requires the travel distance within the mall space of a maximum of 200 feet. The theory is that the measurement starts at all mall entrances and exits, and meets the distances found in IFC Section 905 for sprinklered buildings. However, the current system does nothing for fires in tenant spaces and anchor buildings.

The current code text does not provide adequate coverage for the covered mall building design. The revision in Item 4 will allow for additional hose connections throughout the mall to reach those portions of the mall that are not within 200' of hose from a connection required in Items #1-3.

The term "outlet" is revised to "connection" so that it is consistent throughout the requirements.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Modified

Modify the proposal as follows:

905.3.3 (IBC [F] 905.3.3) (Supp) Covered mall buildings. A covered mall building shall be equipped throughout with a standpipe system where required by Section 905.3.1. Covered mall buildings not required to be equipped with a standpipe system by Section 905.3.1 shall be equipped with Class I hose connections connected to the automatic sprinkler system sized to deliver water at 250 gallons per minute (946.4 L/min) at the most hydraulically remote hose connection while concurrently supplying the automatic sprinkler system demand. The standpipe system shall be designed to not exceed a ~~friction loss of 50 pounds per square inch (345 kPa)~~ residual pressure loss with a flow of 250 gallons per minute (946.4 L/min) from the fire department connection to the hydraulically most remote hose connection. Hose connections shall be provided at each of the following locations:

1. Within the mall at the entrance to each exit passageway or corridor.
2. At each floor-level landing within enclosed stairways opening directly on the mall.
3. At exterior public entrances to the mall.
4. At other locations as necessary so that the distance to reach all portions of a tenant space ~~anchor store~~ does not exceed 200 (60 960 mm) feet from a hose connection.

Committee Reason: The proposal was approved because the committee felt that it provides good guidance to the code official regarding design of standpipe systems in covered malls. The modifications reflect what the committee felt the correct pressure loss terminology should be and also the fact that a covered mall, by definition, does not include anchor stores.

Assembly Action:**None**

Final Hearing Results

F157-07/08

AM

Code Change No: F158-07/08

Original Proposal

Sections: 905.3.7 (IBC [F] 905.3.7)

Proponent: Tom Lariviere, Fire Department, Madison, MS, representing Joint Fire Service Review Committee

Delete without substitution:

~~**905.3.7 (IBC [F] 905.3.7) Marinas and boatyards.** Marinas and boatyards shall be equipped throughout with standpipe systems in accordance with NFPA 303.~~

Reason: This section is no longer needed after the recent adoption of the Chapter 45 Marinas (Supp). Section 905.3.7 now needs to be deleted since the issue of standpipes is now addressed in Chapter 45 (Supp). The deletion needs to occur in the IFC and IBC.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:**Approved as Modified****Modify the proposal as follows:**

905.3.7 (IBC [F] 905.3.7) Marinas and boatyards. Standpipes in marinas and boatyards shall comply with Chapter 45.

Committee Reason: The proposal was approved because the committee felt that that the proponent's reason statement substantiates the need for the change, however the committee also felt that leaving a "pointer" section in Section 905, as indicated in the modification, would be useful to the fire code official.

Assembly Action:**None**

Final Hearing Results

F158-07/08

AM

Code Change No: **F159-07/08**

Original Proposal

Sections: 905.4 (IBC [F] 905.4)

Proponent: Gene Boecker, Code Consultants, Inc.

Revise as follows:

905.4 (IBC [F] 905.4) Location of Class I standpipe hose connections. Class I standpipe hose connections shall be provided in all of the following locations:

1. In every required stairway, a hose connection shall be provided for each floor level above or below grade. Hose connections shall be located at an intermediate floor level landing between floors, unless otherwise approved by the fire code official.
2. On each side of the wall adjacent to the exit opening of a horizontal exit.

Exception: Where floor areas adjacent to a horizontal exit are reachable from exit stairway hose connections by a 30-foot (9144 mm) hose stream from a nozzle attached to 100 feet (30480 mm) of hose, a hose connection shall not be required at the horizontal exit.

3. In every exit passageway, at the entrance from the exit passageway to other areas of a building.

Exception: Where floor areas adjacent to an exit passageway are reachable from exit stairway hose connections by a 30-foot (9144 mm) hose stream from a nozzle attached to 100 feet (30480 mm) of hose, a hose connection shall not be required at the entrance from the exit passageway to other areas of the building.

4. In covered mall buildings, adjacent to each exterior public entrance to the mall and adjacent to each entrance from an exit passageway or exit corridor to the mall.
5. Where the roof has a slope less than four units vertical in 12 units horizontal (33.3-percent slope), each standpipe shall be provided with a hose connection located either on the roof or at the highest landing of a stairway with stair access to the roof. An additional hose connection shall be provided at the top of the most hydraulically remote standpipe for testing purposes.
6. Where the most remote portion of a nonsprinklered floor or story is more than 150 feet (45 720 mm) from a hose connection or the most remote portion of a sprinklered floor or story is more than 200 feet (60 960 mm) from a hose connection, the fire code official is authorized to require that additional hose connections be provided in approved locations.

Reason: The exception to item #2 was included in the code as a recognition of the fact that multiple outlets in the same vicinity do not add to safety but merely increase costs. The same should be true for the situation described in item #3. If there is an outlet that is located in the vicinity of the exit passageway entrance, then it makes sense to use that and not require an outlet at each entrance.

To illustrate, imagine two scenarios: 1) In a multi-level covered mall building, an exit stairway exists in which a vertical standpipe is provided. The stairway is located approximately 30 feet from the mall entrance. Because the code requires an outlet at the entrance to the exit passageway, a second outlet would need to be installed although the area could be reached from the outlet in the stairway. 2) An exit passageway is provided in a health care setting as a way to meet travel distances and smoke compartment criteria. It is not a horizontal exit because the area of refuge does not exist in the passageway. Multiple doors access the corridor from rooms and spaces adjacent to it. According to the current language of the code, a hose outlet would be required adjacent to each of these doors which would result in an outlet every 20 – 30 feet (or even closer) inside the passageway.

In both these scenarios the literal application of the code does not contribute to additional safety but merely adds cost to the construction. It is only reasonable that the exception apply to this condition in the same manner as that item immediately prior.

This proposal will afford the same level of logic and reason as that in the prior item and eliminate a sometimes costly duplication.

Cost Impact: The code change proposal will not increase the cost of construction. A reduction in construction costs will occur in situations where the proposed exception reduces the redundant outlet(s).

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The proposal was approved because the committee felt that it provides a useful clarification and refinement of required standpipe hose connection locations.

Assembly Action:

None

Final Hearing Results

F159-07/08

AS

Code Change No: **F160-07/08**

Original Proposal

Sections: 906.2 (IBC [F] 906.2)

Proponent: A. Brooks Ballard, Virginia Department of Corrections

Revise as follows:

906.2 (IBC [F] 906.2) (Supp) General requirements. Portable fire extinguishers shall be selected, installed and maintained in accordance with this section and NFPA 10.

Exceptions:

1. The travel distance to reach an extinguisher shall not apply to the spectator seating portions of Group A-5 occupancies.
2. Thirty-day inspections shall not be required and maintenance shall be allowed to be once every three years for dry-chemical or halogenated agent portable fire extinguishers that are supervised by a listed and approved electronic monitoring device, provided that all of the following conditions are met:
 - 2.1. Electronic monitoring shall confirm that extinguishers are properly positioned, properly charged and unobstructed.
 - 2.2. Loss of power or circuit continuity to the electronic monitoring device shall initiate a trouble signal.
 - 2.3. The extinguishers shall be installed inside of a building or cabinet in a noncorrosive environment.
 - 2.4. Electronic monitoring devices and supervisory circuits shall be tested every three years when extinguisher maintenance is performed.
 - 2.5. A written log of required hydrostatic test dates for extinguishers shall be maintained by the owner to ensure that hydrostatic tests are conducted at the frequency required by NFPA10.
3. In Group I-3, portable fire extinguishers shall be permitted to be located at staff locations.

Reason: Extinguishers located throughout the facility are at times tampered with, removed and/or used for weapons by occupants in a detention or correctional setting. This change would protect the extinguishers from damage or removal by inmates while still making them available to staff and employees for use in an emergency situation. At least one of the Legacy Codes allowed extinguishers to be located at staff locations and/or locked.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The proposal was approved because the committee felt that it provides a reasonable exception to the fire extinguisher location requirements for Group I-3 occupancies, where tampering is a concern.

Assembly Action:

None

Final Hearing Results

F160-07/08

AS

Code Change No: **F161-07/08**

Original Proposal

Sections: 907.1.1, 907.1.2 (New) [IBC [F] 907.1.1, [F] 907.1.2 (New)]

Proponent: Gene Boecker, Code Consultants, Inc.

Revise as follows:

907.1.1 (IBC [F] 907.1.1) (Supp) Construction documents. ~~Construction documents for fire alarm systems shall be submitted for review and approval prior to system installation.~~ of sufficient clarity to indicate the location, nature and extent of the work proposed and show in detail that it will conform to the provisions of this code, the *International Building Code*, and relevant laws, ordinances, rules and regulations, as determined by the fire code official.

907.1.2 (IBC [F] 907.1.2) (Supp) Fire alarm shop drawings. ~~Construction documents~~ Shop drawings for fire alarm systems shall be submitted for review and approval prior to system installation. ~~Construction documents~~ and shall include, but not be limited to, all of the following:

1. A floor plan which indicates the use of all rooms.
2. Locations of alarm-initiating ~~and notification appliances~~ devices.
3. Locations of alarm notification appliances, including candela ratings for visible alarm notification appliances.
3. 4 Location of fire alarm control unit, transponders, and notification power supplies.
4. 5 Annunciators.
5. 6 Power connection.
6. 7 Battery calculations.
7. 8 Conductor type and sizes.
8. 9 Voltage drop calculations.
9. 10 Manufacturers, data sheets indicating model numbers and listing information for equipment, devices and materials.
10. 11 Details of ceiling height and construction.
11. 12 The interface of fire safety control functions.
12. 13 Classification of the supervising station.

907.1.2 (Supp) 907.1.3 (IBC [F] 907.1.3) Equipment. (No change to current text)

Reason: Section 907 evolved as an amalgamation of the three legacy codes. Although Section 907 was revised during the last cycle some additional items have been identified that need further clarification. The charging statement for Occupancy Groups is inconsistent. The text that indicates what is required is inconsistent. And, the general arrangement of text, although in a logical format, is not consistent with the way many people approach the code. Nor is it consistent with the way that Section 903 is organized. The proposal is an effort made by a group of people from various segments of the industry and code application to correlate, reformat and generally improve usability of the code. Before addressing the technical and formatting changes involved in the proposal, it is worth noting appreciation to the people who helped work on this effort. In alphabetical order:

Bill Aaron (Code Consultants, Inc.),
 Diane Arend (Office of the State Fire Marshal; California),
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 Tom Hammerberg (Automatic Fire Alarm Association, Inc),
 Bill Hoppie (SimplexGrinnell),
 Dan Nichols (Building Codes Division; State of New York),
 Jim Schifiliti (Fire Safety Consultants, Inc)

These changes are important because construction documents and shop drawings are not for the same purpose. The wording added to 907.1.1 was extracted from the IBC, Section 106.1.1. Shop drawings referred to in Section 907 are specific to fire alarm equipment and installation. This information may not be available at the time the contractor applies for the building permit, but is essential for review prior to the installation of the fire alarm system.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The proposal was approved because the committee felt that the change provides a needed refinement of the construction document requirements which were part of the reorganization of Section 907 in the last cycle.

Assembly Action:

None

Final Hearing Results

F161-07/08

AS

Code Change No: F162-07/08

Original Proposal

Sections: 907.2 (IBC [F] 907.2)

Proponent: Jeffrey M. Shapiro, PE, International Code Consultants, representing National Multi Housing Council

Revise as follows:

907.2 (IBC [F] 907.2) (Supp) Where required - new buildings and structures. An approved manual, automatic or manual and automatic fire alarm system installed in accordance with the provisions of this code and NFPA 72 shall be provided in new buildings and structures in accordance with Sections 907.2.1 through 907.2.22 and provide occupant notification in accordance with Section 907.6, unless other requirements are provided by another section of this code.

A minimum of one manual fire alarm box shall be provided in an approved location to initiate a fire alarm signal for fire alarm systems employing automatic fire detectors or waterflow detection devices. Where other sections of this code allow elimination of fire alarm boxes due to sprinklers, a single fire alarm box shall be installed.

Exceptions:

1. The manual fire alarm box is not required for fire alarm systems dedicated to elevator recall control and supervisory service.
2. The manual fire alarm box is not required for Group R-2 occupancies.

Reason: Manual fire alarm boxes in apartment occupancies invite tampering and false alarms, and there is no apparent fire safety benefit to be gained by placing a single fire alarm box in such occupancies.

Justification offered last year to substantiate the need for the single manual alarm box was that it might be needed by a sprinkler technician to initiate an alarm if sprinklers/waterflow switches are out of service, but this makes no sense. Assuming that the alarm box is located in the valve room to avoid making it available to vandals, a technician working on any part of the sprinkler system, other than the valve, would be far away, and may or may not even know where the alarm box is. If the box were to be located where it will be accessible for occupant use, it is difficult to believe that occupants would know the location of a single pull box in a building or that they would seek out the box to initiate an alarm if the waterflow switch failed.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Modified

Modify the proposal as follows:

907.2 (IBC [F] 907.2) (Supp) Where required - new buildings and structures. An approved manual, automatic or manual and automatic fire alarm system installed in accordance with the provisions of this code and NFPA 72 shall be provided in new buildings and structures in accordance with Sections 907.2.1 through 907.2.22 and provide occupant notification in accordance with Section 907.6, unless other requirements are provided by another section of this code.

A minimum of one manual fire alarm box shall be provided in an approved location to initiate a fire alarm signal for fire alarm systems employing automatic fire detectors or waterflow detection devices. Where other sections of this code allow elimination of fire alarm boxes due to sprinklers, a single fire alarm box shall be installed.

Exceptions:

1. The manual fire alarm box is not required for fire alarm systems dedicated to elevator recall control and supervisory service.
2. The manual fire alarm box is not required for Group R-2 occupancies unless required by the fire code official to provide a means for fire watch personnel to initiate an alarm during a sprinkler system impairment event. Where provided, the manual fire alarm box shall not be located in an area that is accessible to the public.

Committee Reason: The proposal was approved because the committee agreed that the manual fire alarm box should not be provided in Group R-2 where false alarms are a problem. The modification avoids putting the manual fire alarm box in all Group R-2 occupancies where there could be a false alarm problem while leaving open the option for the fire code official to require one in a restricted location for use by fire watch personnel, if needed.

Assembly Action:

None

Final Hearing Results

F162-07/08

AM

Code Change No: F163-07/08

Original Proposal

Sections: 907.2, 907.2.6.3, 907.2.8.2, 907.2.11, 907.2.12, 907.2.12.1, 907.2.13, 907.2.14, 907.2.17, 902.1 (IBC [F] 907.2, [F] 907.2.6.3, [F] 907.2.8.2, [F] 907.2.11, [F] 907.2.12, [F] 907.2.12.1, [F] 907.2.13, [F] 907.2.14, [F] 907.2.17, [F] 902.1)

Proponent: Gene Boecker, Code Consultants, Inc.

1. Revise as follows:

907.2 (IBC [F] 907.2) (Supp) Where required new buildings and structures. An approved ~~manual, automatic or manual and automatic~~ fire alarm system installed in accordance with the provisions of this code and NFPA 72 shall be provided in new buildings and structures in accordance with Sections 907.2.1 through 907.2.22 and provide occupant notification in accordance with Section 907.6, unless other requirements are provided by another section of this code.

A minimum of one manual fire alarm box shall be provided in an approved location to initiate a fire alarm signal for fire alarm systems employing automatic fire detectors or waterflow detection devices. Where other sections of this code allow elimination of fire alarm boxes due to sprinklers, a single fire alarm box shall be installed.

Exception: The manual fire alarm box is not required for fire alarm systems dedicated to elevator recall control and supervisory service.

907.2.6.3 (IBC [F] 907.2.6.3) (Supp) Group I-3 occupancies. Group I-3 occupancies shall be equipped with a manual ~~fire alarm system~~ and automatic ~~fire alarm~~ smoke detection system installed for alerting staff.

907.2.8.2 (IBC [F] 907.2.8.2) (Supp) Automatic smoke detection fire alarm system. An automatic ~~smoke detection fire alarm~~ system that activates the occupant notification system in accordance with Section 907.6 shall be installed throughout all interior corridors serving sleeping units.

Exception: An automatic ~~smoke fire~~ detection system is not required in buildings that do not have interior corridors serving sleeping units and where each sleeping unit has a means of egress door opening directly to an exit or to an exterior exit access that leads directly to an exit.

907.2.11 (IBC [F] 907.2.11) (Supp) Special amusement buildings. An automatic smoke detection system shall be provided in special amusement buildings in accordance with Sections 907.2.11.1 through 907.2.11.3.

Exception: ~~In areas where ambient conditions will cause a smoke detection system to alarm, an approved alternative type of automatic fire detector shall be installed.~~

907.2.12 (IBC [F] 907.2.12) (Supp) High-rise buildings. Buildings with a floor used for human occupancy located more than 75 feet (22 860 mm) above the lowest level of fire department vehicle access shall be provided with an automatic ~~fire alarm~~ smoke detection system in accordance with Section 907.2.12.1 and an emergency voice/alarm communication system in accordance with Section 907.6.2.2.

Exceptions:

1. Airport traffic control towers in accordance with Section 907.2.21 and Section 412 of the *International Building Code*.
2. Open parking garages in accordance with Section 406.3 of the *International Building Code*.
3. Buildings with an occupancy in Group A-5 in accordance with Section 303.1 of the *International Building Code*.
4. Low-hazard special occupancies in accordance with Section 503.1.1 of the *International Building Code*.
5. Buildings with an occupancy in Group H-1, H-2 or H-3 in accordance with Section 415 of the *International Building Code*.
6. In Group I-1 and I-2 occupancies, the alarm shall sound at a constantly attended location and general occupant notification shall be broadcast by the paging system.

907.2.12.1 (IBC [F] 907.2.12.1) (Supp) Automatic fire ~~smoke~~ detection. ~~Smoke detectors~~ An automatic smoke detection system shall be provided in accordance with this section. ~~Smoke detectors shall be connected to an automatic fire alarm system.~~ The activation of any detector required by this section shall operate the emergency voice/alarm communication system. Smoke detectors shall be located as follows:

1. In each mechanical equipment, electrical, transformer, telephone equipment or similar room which is not provided with sprinkler protection, elevator machine rooms, and in elevator lobbies.
2. In the main return air and exhaust air plenum of each air-conditioning system having a capacity greater than 2,000 cubic feet per minute (cfm) (0.94 m³/s). Such detectors shall be located in a serviceable area downstream of the last duct inlet.
3. At each connection to a vertical duct or riser serving two or more stories from a return air duct or plenum of an air-conditioning system. In Group R-1 and R-2 occupancies, a smoke detector is allowed to be used in each return-air riser carrying not more than 5,000 cfm (2.4m³/s) and serving not more than 10 air-inlet openings.

907.2.13 (IBC [F] 907.2.13) (Supp) Atriums connecting more than two stories. A ~~fire alarm~~ smoke detection system shall be installed in occupancies with an atrium that connects more than two stories. The system shall be activated in accordance with Section 907.6. Such occupancies in Group A, E or M shall be provided with an emergency voice/alarm communication system complying with the requirements of Section 907.6.2.2.

907.2.14 (IBC [F] 907.2.14) (Supp) High-piled combustible storage areas. An automatic ~~fire~~ smoke detection system shall be installed throughout high-piled combustible storage areas where required by Section 2306.5.

907.2.17 (IBC [F] 907.2.14) (Supp) Underground buildings with smoke control systems. Where a smoke control system is installed in an underground building in accordance with the *International Building Code*, automatic ~~fire~~ smoke detectors shall be provided in accordance with Sections ~~907.2.17.1 and 907.2.17.2~~.

2. Add new definition as follows:

902.1 Definitions. The following words and terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

AUTOMATIC SMOKE DETECTION SYSTEM. A fire alarm system that has initiation devices that utilize smoke detectors for protection of an area such as a room or space with detectors to provide early warning of fire.

Reason: Section 907 evolved as an amalgamation of the three legacy codes. Although Section 907 was revised during the last cycle some additional items have been identified that need clarification. The charging statement for Occupancy Groups is inconsistent. The text that indicates what is required is inconsistent. And, the general arrangement of text, although in a logical format, is not consistent with the way many people approach the code. Nor is it consistent with the way that Section 903 is organized. The proposal is an effort made by a group of people from various segments of the industry and code application to correlate, reformat and generally improve usability of the code. Before addressing the technical and formatting changes involved in the proposal, it is worth noting appreciation to the people who helped work on this effort. In alphabetical order:

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 John Guhl (Office of the State Fire Marshal; California),

Tom Hammerberg (Automatic Fire Alarm Association, Inc),
Bill Hopple (SimplexGrinnell),
Dan Nichols (Building Codes Division; State of New York),
Jim Schifiliti (Fire Safety Consultants, Inc)

The main purpose of this code proposal is to align terms within this Section to two main terms, “automatic smoke detection system” and “manual fire alarm system.” Currently, the language can be confusing with some sections requiring automatic fire detection systems and others requiring automatic smoke detection systems. Both of these terms are technically requiring the same thing. However, an automatic fire detection can be interpreted as a sprinkler system, which is not the intent of this section. If it was, the requirements would be found in Section 903.

A definition has been added for automatic smoke detection system, to assist the code user in determining what the code is specifically requiring.

Of special note, Section 907.2.11 appears to be a technical change. However, this is editorial since this allowance is globally accepted throughout Section 907, being specifically regulated in Section 907.5.3.

Furthermore, Section 907.2.12.1 removes redundant language with the addition of the ‘system’ requirement and is not a technical change.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Modified

Modify the proposal as follows:

907.2.13 (IBC [F] 907.2.13) (Supp) Atriums connecting more than two stories. A ~~fire alarm smoke detection~~ system shall be installed in occupancies with an atrium that connects more than two stories, with smoke detection installed throughout the atrium. The system shall be activated in accordance with Section 907.6. Such occupancies in Group A, E or M shall be provided with an emergency voice/alarm communication system complying with the requirements of Section 907.6.2.2.

(Portions of proposal not shown remain unchanged)

Committee Reason: The proposal was approved because the committee felt that it will provide correlated usage of the newly defined term “automatic smoke detection system” and the term “manual fire alarm system”, thus eliminating the current confusion caused by some sections requiring “automatic fire detection systems” (which could be interpreted as being a sprinkler system) and others requiring “automatic smoke detection systems”. The modification provides clarification that only the atrium portion of the building is required to be provided with smoke detection, not the entire building.

Assembly Action:

None

Final Hearing Results

F163-07/08

AM

Code Change No: F164-07/08

Original Proposal

Sections: 907.2.5, 907.2.6, 907.2.6.3.3, 907.2.7.1, 907.2.12.2, 907.6, 907.6.2.1.1, 9097.6.2.1.2, 907.6.2.2, 907.6.2.3.3 (New), 907.6.2.2.4, 907.7.3.2, 907.7.4 (IBC [F] 907.2.5, [F] 907.2.6, [F] 907.2.6.3.3, [F] 907.2.7.1, [F] 907.2.12.2, [F] 907.6, [F] 907.6.2.1.1, [F] 907.6.2.1.2, [F] 907.6.2.2, [F] 907.6.2.3.3 (New), [F] 907.6.2.2.4, [F] 907.7.3.2, [F] 907.7.4

Proponent: Gene Boecker, Code Consultants, Inc.

Revise as follows:

907.2.5 (IBC [F] 907.2.5) (Supp) Group H. A manual fire alarm system that activates the occupant notification system shall be installed in Group H-5 occupancies and in occupancies used for the manufacture of organic coatings. An automatic smoke detection system that activates the occupant notification system shall be installed for highly toxic gases, organic peroxides and oxidizers in accordance with Chapters 37, 39 and 40, respectively.

907.2.6 (IBC [F] 907.2.6) (Supp) Group I. A manual fire alarm system that activates the occupant notification system shall be installed in Group I occupancies. An automatic smoke detection system that activates the occupant notification system shall be provided in accordance with Sections 907.2.6.1 and 907.2.6.2.

907.2.6.3.3 (IBC [F] 907.2.6.3.3) Smoke detectors. An automatic smoke detection system shall be installed throughout resident housing areas, including sleeping units and contiguous day rooms, group activity spaces and other common spaces normally accessible to residents.

Exceptions:

1. Other approved smoke-detection arrangements providing equivalent protection, including, but not limited to, placing detectors in exhaust ducts from cells or behind protective guards listed for the purpose, are allowed when necessary to prevent damage or tampering.
2. Sleeping units in Use Conditions 2 and 3 as described in Section 308 of the *International Building Code*.
3. Smoke detectors are not required in sleeping units with four or fewer occupants in smoke compartments that are equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1.

907.2.7.1 (IBC [F] 907.2.7.1) (Supp) Occupant notification. During times that the building is occupied, the initiation of a signal from a manual fire alarm box or from a water flow switch shall not be required to activate the alarm notification appliances when an alarm signal is activated at a constantly attended location from which evacuation instructions shall be initiated over an emergency voice/alarm communication system installed in accordance with Section 907.6.2.2.

~~The emergency voice/alarm communication system shall be allowed to be used for other announcements, provided the manual fire alarm use takes precedence over any other use.~~

907.2.12.2 (IBC [F] 907.2.12.2) (Supp) Fire department communication system. An approved two-way, fire department communication system designed and installed in accordance with NFPA 72 shall be provided for fire department use. It shall operate between a fire command center complying with Section 509 and elevators, elevator lobbies, emergency and standby power rooms, fire pump rooms, areas of refuge and inside enclosed exit stairways. The fire department communication device shall be provided at each floor level within the enclosed exit stairway.

Exception: Fire department radio systems are allowed to replace two-way fire department communication systems where approved by the fire department.

907.6 (IBC [F] 907.6) (Supp) Alarm Occupant notification systems. A fire alarm system shall annunciate at the panel and shall initiate occupant notification upon activation, in accordance with Sections 907.6.1 through 907.6.2.3.4. Where a fire alarm system is required by another section of this code, it shall be activated by:

1. Automatic fire detectors.
2. Sprinkler water-flow devices.
3. Manual fire alarm boxes.
4. Automatic fire-extinguishing systems.

Exceptions:

- ~~1. Occupant notification is not required for fire detectors used to control fire safety functions in accordance with Section 907.4.~~
2. Where notification systems are allowed elsewhere in Section 907 to annunciate at a constantly attended location.

907.6.2.1.1 (IBC [F] 907.6.2.1.1) (Supp) Average sound pressure. The audible alarm notification appliances shall provide a sound pressure level of 15 decibels (dBA) above the average ambient sound level or 5 dBA above the maximum sound level having a duration of at least 60 seconds, whichever is greater, in every ~~occupied~~ occupiable space within the building. The minimum sound pressure levels shall be: 75 dBA in occupancies in Groups R and I-1; 90 dBA in mechanical equipment rooms; and 60 dBA in other occupancies.

907.6.2.1.2 (IBC [F] 907.6.2.1.2) (Supp) Maximum sound pressure. The maximum sound pressure level for audible alarm notification appliances shall be 110 dBA at the minimum hearing distance from the audible appliance. Where the average ambient noise is greater than ~~405~~ 95 dBA, visible alarm notification appliances shall be provided in accordance with NFPA 72 and audible alarm notification appliances shall not be required.

907.6.2.2 (IBC [F] 907.6.2.2) (Supp) Emergency voice/alarm communication system. The emergency voice/alarm communication system shall be designed and installed in accordance with NFPA 72. The operation of any automatic fire detector, sprinkler waterflow device or manual fire alarm box shall automatically sound an alert tone followed by voice instructions giving approved information and directions for a general or staged evacuation on a minimum of the alarming floor, the floor above and the floor below in accordance with the buildings fire safety and evacuation plans required by Section 404. In high-rise buildings, the system shall operate on a minimum of the alarming floor, the floor above and the floor below. Speakers shall be provided throughout the building by paging zones. As a minimum, paging zones shall be provided as follows:

1. Elevator groups.
2. Exit stairways.
3. Each floor.
4. Areas of refuge as defined in Section 1002.1.

Exception: In Group I-1 and I-2 occupancies, the alarm shall sound in a constantly attended area and a general occupant notification shall be broadcast over the overhead page.

907.6.2.2.3 (IBC [F] 907.6.2.2.3) Alternate uses. The emergency voice/alarm communication system shall be allowed to be used for other announcements, provided the manual fire alarm use takes precedence over any other use.

(Renumber subsequent section)

907.7.3.2 (IBC [F] 907.7.3.2) (Supp) High-rise buildings. In buildings with a floor used for human occupancy that is located more than 75 feet (22 860 mm) above the lowest level of fire department vehicle access, a separate zone by floor shall be provided for all each of the following types of alarm-initiating devices where provided:

1. Smoke detectors.
2. Sprinkler water-flow devices.
3. Manual fire alarm boxes.
4. Other approved types of automatic fire detection devices or suppression systems.

907.7.4 (IBC [F] 907.7.4) (Supp) Access. Access shall be provided to each ~~detector~~ fire alarm device and notification appliance for periodic inspection, maintenance and testing.

Reason: Section 907 evolved as an amalgamation of the three legacy codes. Although Section 907 was revised during the last cycle some additional items have been identified that need clarification. The charging statement for Occupancy Groups is inconsistent. The text that indicates what is required is inconsistent. And, the general arrangement of text, although in a logical format, is not consistent with the way many people approach the code. Nor is it consistent with the way that Section 903 is organized. The proposal is an effort made by a group of people from various segments of the industry and code application to correlate, reformat and generally improve usability of the code. Before addressing the technical and formatting changes involved in the proposal, it is worth noting appreciation to the people who helped work on this effort. In alphabetical order:

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 Bill Hopple (SimplexGrinnell),
 Dan Nichols (Building Codes Division; State of New York),
 Jim Schifiliti (Fire Safety Consultants, Inc)

907.2.5 Justification – The added language is for consistency with the language for other Occupancy Groups.

907.2.6 Justification – The added language is for consistency with the language for other Occupancy Groups.

907.6.3.3 Exceptions Justification – The added language is to identify where to find more information regarding Use Conditions 2 and 3. This improves usability of the Code.

907.2.7.1 Justification – The language is relocated to section 907.6.2.2 for clarity so that emergency voice alarm system requirements are grouped in one area.

907.2.12.2 Justification – The added language is for clarity indicating that fire department radio systems are allowed as a substitute for two-way fire department communications systems.

907.6 Justification – This exception is in direct conflict with the requirements of Section 907.4 which requires occupant notification.

907.6.2.1.1 Justification - The added language is for consistency with the language throughout this code.

907.6.2.1.2 Justification – The decibel level is revised to be in alignment with NFPA 72 and A.D.A.

907.6.2.2.3 Justification – The language is relocated from section 907.2.7.1 for clarity so that emergency voice alarm system requirements are grouped in one area.

907.6.2.2.34 Justification – Renumbering to incorporate the relocated emergency voice/alarm communication requirement.

907.7.4 Justification – The added language is for clarity indicating that access is to be provide for all fire alarm devices for servicing

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:**Approved as Submitted**

Committee Reason: The proposal was approved because the committee agreed that the change provides a logical, needed refinement and correlation of the language used in all occupancy group fire alarm requirements which were part of the reorganization of Section 907 in the last cycle.

Assembly Action:**None**

Final Hearing Results

F164-07/08

AS

Code Change No: F165-07/08

Original Proposal

Sections: 907.2.6 (IBC [F] 907.2.6)**Proponent:** Gene Boecker, Code Consultants, Inc.**Revise as follows:**

907.2.6 (IBC [F] 907.2.6) (Supp) Group I. A manual fire alarm system shall be installed in Group I occupancies. An automatic smoke detection system shall be provided in accordance with Sections 907.2.6.1 and 907.2.6.2.

Exceptions:

1. Manual fire alarm boxes in resident or patient sleeping areas of Group I-1 and I-2 occupancies shall not be required at exits if located at all nurses= control stations or other constantly attended staff locations, provided such stations are visible and continuously accessible and that travel distances required in Section 907.5.2 are not exceeded.
2. Occupant notification systems are not required to be activated where private mode signaling installed in accordance with NFPA 72 is approved by the fire code official.

Reason: Section 907 evolved as an amalgamation of the three legacy codes. Although Section 907 was revised during the last cycle some additional items have been identified that need further clarification. The charging statement for Occupancy Groups is inconsistent. The text that indicates what is required is inconsistent. And, the general arrangement of text, although in a logical format, is not consistent with the way many people approach the code. Nor is it consistent with the way that Section 903 is organized. The proposal is an effort made by a group of people from various segments of the industry and code application to correlate, reformat and generally improve usability of the code. Before addressing the technical and formatting changes involved in the proposal, it is worth noting appreciation to the people who helped work on this effort. In alphabetical order:

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 John Guhl (Office of the State Fire Marshal; California),
 Tom Hammerberg (Automatic Fire Alarm Association, Inc),
 Bill Hopple (SimplexGrinnell),
 Dan Nichols (Building Codes Division; State of New York),
 Jim Schifiliti (Fire Safety Consultants, Inc)

The new exception is to clearly allow only notifying the staff instead of all building occupants in the event of a fire. This is a common practice in Group I occupancies, and the current language would not allow that.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:**Approved as Submitted**

Committee Reason: The committee agreed that there is no need to notify of a fire alarm the occupants who are incapable of taking meaningful evacuation action in response to it and that the fire code official should have specific approval authority in that decision.

Assembly Action:

None

Final Hearing Results

F165-07/08

AS

Code Change No: **F166-07/08**

Original Proposal

Sections: 907.2.9.1 (IBC [F] 907.2.9.1)

Proponent: Jeffrey M. Shapiro, PE, International Code Consultants, representing himself

Revise as follows:

907.2.9.1 (IBC [F] 907.2.9.1) (Supp) Manual fire alarm system. A manual fire alarm system that activates the occupant notification system in accordance with Section 907.6 shall be installed in Group R-2 occupancies where:

1. Any dwelling unit or sleeping unit is located three or more stories above the lowest level of exit discharge;
2. Any dwelling unit or sleeping unit is located more than one story below the highest level of exit discharge of exits serving the dwelling unit or sleeping unit; or
3. The building contains more than 16 dwelling units or sleeping units.

Exceptions:

1. A fire alarm system is not required in buildings not more than two stories in height where all dwelling units or sleeping units and contiguous attic and crawl spaces are separated from each other and public or common areas by at least 1-hour fire partitions and each dwelling unit or sleeping unit has an exit directly to a public way, exit court or yard.
4. 2. Manual fire alarm boxes are not required where the building is equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2 and the occupant notification appliances will automatically activate throughout the notification zones upon a sprinkler water flow.
2. ~~A manual fire alarm system is not required in buildings not more than two stories in height that do not have interior corridors serving dwelling units provided that dwelling units either have a means of egress door opening directly to an exterior exit access that leads directly to the exits or are served by open-ended corridors designed in accordance with Section 1023.6, Exception 4.~~
3. A fire alarm system is not required in buildings that do not have interior corridors serving dwelling units and are protected by an approved automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2, provided that dwelling units either have a means of egress door opening directly to an exterior exit access that leads directly to the exits or are served by open-ended corridors designed in accordance with Section 1023.6, Exception 4.

Reason: This proposal returns the exceptions in Section 907.2.9.1 to the 2006 IFC text. These exceptions were changed as part of Proposal F122-06/07, which according to the proponent was not intended to make technical changes to the 2006 requirements. However, closer scrutiny revealed that the change significantly reduced the scope of the old Exception 3 (which was revised and renumbered as Exception 2 in the 2007 Supplement) by limiting application to only allow elimination of manual alarms, as opposed to the entire alarm system, and only in buildings not exceeding two stories in height.

Likewise, the change to the old Exception 1 (which was revised and incorporated into Exception 2 in the 2007 Supplement) significantly reduced the scope of Exception 1 by only allowing elimination of manual fire alarm boxes, as opposed to the entire alarm system. Because Proposal F122 provided no justification for making these technical changes, this proposal simply reverses unsubstantiated revisions to the code.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:**Approved as Submitted**

Committee Reason: The proposal was approved because the committee felt that the change returning the exceptions to the 2006 edition Section 907.2.9.1 is appropriate because the reorganization of Section 907 in the last cycle did not intend to make any technical changes but did in this case, without any justification.

Assembly Action:**None**

Final Hearing Results

F166-07/08

AS

Code Change No: F167-07/08

Original Proposal

Sections: 907.2.10 through 907.2.10.3 (New) [IBC [F] 907.2.10 through [F] 907.2.10.3 (New)], 907.3.3.4

Proponent: Gene Boecker, Code Consultants, Inc.

1. Add new text as follows:

907.2.10 (IBC [F] 907.2.10) Group R-4. Fire alarm systems and smoke alarms shall be installed in Group R-4 occupancies as required in Sections 907.2.10.1 through 907.2.10.3.

907.2.10.1 (IBC [F] 907.2.10.1) Manual fire alarm system. A manual fire alarm system that activates the occupant notification system in accordance with Section 907.6 shall be installed in Group R-4 occupancies.

Exceptions:

1. A manual fire alarm system is not required in buildings not more than two stories in height where all individual sleeping units and contiguous attic and crawl spaces to those units are separated from each other and public or common areas by at least 1-hour fire partitions and each individual sleeping unit has an exit directly to a public way, exit court or yard.
2. Manual fire alarm boxes are not required throughout the building when the following conditions are met:
 - 2.1. The building is equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2.
 - 2.2. The notification appliances will activate upon sprinkler water flow; and
 - 2.3. At least one manual fire alarm box is installed at an approved location.
3. Manual fire alarm boxes in resident or patient sleeping areas shall not be required at exits where located at all nurses' control stations or other constantly attended staff locations, provided such stations are visible and continuously accessible and that travel distances required in Section 907.5.2.1 are not exceeded.

907.2.10.2 (IBC [F] 907.2.10.2) Automatic smoke detection system. An automatic smoke detection system that activates the occupant notification system in accordance with Section 907.6 shall be installed in corridors, waiting areas open to corridors and habitable spaces other than sleeping units and kitchens.

Exceptions:

1. Smoke detection in habitable spaces is not required where the facility is equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1.
2. An automatic smoke detection system is not required in buildings that do not have interior corridors serving sleeping units and where each sleeping unit has a means of egress door opening directly to an exit or to an exterior exit access that leads directly to an exit.

907.2.10.3 (IBC [F] 907.2.10.3) Smoke alarms. Single- and multiple-station smoke alarms shall be installed in accordance with Section 907.2.11.

(Renumber subsequent sections)

2. Revise as follows:

907.3.3.4 (Supp) Group R-4. An automatic or manual fire alarm system that activates the occupant notification system in accordance with Section 907.6 shall be installed in existing Group R-4 residential care/assisted living facilities in accordance with Section 907.2.10.

Exceptions:

1. Where there are interconnected smoke alarms meeting the requirements of Section ~~907.2.10~~ 907.2.11 and there is at least one manual fire alarm box per floor arranged to sound continuously the smoke alarms.
2. Other manually activated, continuously sounding alarms approved by the fire code official.

Reason: Section 907 evolved as an amalgamation of the three legacy codes. Although Section 907 was revised during the last cycle some additional items have been identified that need further clarification. The charging statement for Occupancy Groups is inconsistent. The text that indicates what is required is inconsistent. And, the general arrangement of text, although in a logical format, is not consistent with the way many people approach the code. Nor is it consistent with the way that Section 903 is organized. The proposal is an effort made by a group of people from various segments of the industry and code application to correlate, reformat and generally improve usability of the code. Before addressing the technical and formatting changes involved in the proposal, it is worth noting appreciation to the people who helped work on this effort. In alphabetical order:

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Tom Hammerberg (Automatic Fire Alarm Association, Inc),
Bill Hopple (SimplexGrinnell),
Dan Nichols (Building Codes Division; State of New York),
Jim Schifiliti (Fire Safety Consultants, Inc)

This is to add a requirement for new Group R-4 occupancies. Reviewing the occupancy categories in Chapter 3, a Group R-4 can be considered either a small Group I-1 or a Group R-2 with occupants that have special needs or limitations. A further review finds that both Group I-1 and Group R-2 occupancies both have fire alarm requirements for new buildings, but Group R-4 does not. The lack of needed requirements in the current IBC/IFC is very evident. The code change proposal will not increase the cost of construction since IFC Section 907.3 requires a fire alarm retroactively in Group R-4 occupancies. As the IFC currently reads, a one day old R-4 would technically be required to retrofit an automatic or manual alarm system into the building, which doesn't make sense.

The proposed language is based on the Group R-2 requirements for manual fire alarm systems and Group I-1 requirements for automatic smoke detection systems. The proposed language adds exceptions that would apply to Group I-1 occupancies, such as additional manual pull box exceptions for sprinklered sleeping areas and nurses stations, and removes the 16 dwelling unit requirement for manual fire alarms since an Group R-4 cannot have more than 16 occupants.

The proposed language also modifies the retroactive Group R-4 requirements to reference back to the new requirements. Currently, there is not clear direction on what is required for a fire alarm system retroactively. The reference to the new section provides needed requirements.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The committee felt that the change provides a needed refinement and correlation of the fire protection requirements for new Group R-4 occupancies, which are currently in conflict with the alarm requirements for existing Group R-4 occupancies. Currently, existing Group R-4 occupancies are required to be provided with an automatic or manual fire alarm whereas new Group R-4 occupancies are not required to be so equipped.

Assembly Action:

None

Final Hearing Results

F167-07/08

AS

Code Change No: **F168-07/08**

Original Proposal

Sections: 907.2.12 (IBC [F] 907.2.12)

Proponent: Gene Boecker, Code Consultants, Inc.

Revise as follows:

907.2.12 (IBC [F] 907.2.12) (Supp) High-rise buildings. Buildings with a floor used for human occupancy located more than 75 feet (22 860 mm) above the lowest level of fire department vehicle access shall be provided with an automatic fire alarm system and an emergency voice/alarm communication system in accordance with Section 907.6.2.2.

Exceptions:

1. Airport traffic control towers in accordance with Section 907.2.21 and Section 412 of the *International Building Code*.
2. Open parking garages in accordance with Section 406.3 of the *International Building Code*.
3. Buildings with an occupancy in Group A-5 in accordance with Section 303.1 of the *International Building Code*.
4. Low-hazard special occupancies in accordance with Section 503.1.1 of the *International Building Code*.
5. Buildings with an occupancy in Group H-1, H-2 or H-3 in accordance with Section 415 of the *International Building Code*.
6. In Group I-1 and I-2 occupancies, the alarm shall sound at a constantly attended location and general occupant notification shall be broadcast by the ~~paging system~~ emergency voice/alarm communication system.

Reason: Section 907 evolved as an amalgamation of the three legacy codes. Although Section 907 was revised during the last cycle some additional items have been identified that need further clarification. The charging statement for Occupancy Groups is inconsistent. The text that indicates what is required is inconsistent. And, the general arrangement of text, although in a logical format, is not consistent with the way many people approach the code. Nor is it consistent with the way that Section 903 is organized. The proposal is an effort made by a group of people from various segments of the industry and code application to correlate, reformat and generally improve usability of the code. Before addressing the technical and formatting changes involved in the proposal, it is worth noting appreciation to the people who helped work on this effort. In alphabetical order:

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 Jim Schifiliti (Fire Safety Consultants, Inc)

All other fire alarm systems in high-rises require the use of an emergency voice/alarm communication system. Paging systems do not have supervised wiring or specific secondary power requirements. There is no assurance this system will work when it is needed to work. NFPA 72 and this Code allow emergency voice/alarm systems to be used for other purposes, such as paging. In addition, NFPA 72 does not require emergency voice/alarm systems to operate automatically, so the operation will be the same with the added benefit of having the circuits supervised and the ability to operate on secondary power in the event of a building power failure. Currently there is no requirement for paging systems to be on an emergency power source.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The proposal was approved because the committee felt that it corrects the type of voice system suitable for high-rise buildings to a more reliable, supervised voice alarm communications system.

Assembly Action:

None

Final Hearing Results

F168-07/08

AS

Code Change No: **F169-07/08**

Original Proposal

Sections: 907.2.12.1, 907.2.12.1.1 (New), 907.2.12.1.2 (New) [IBC [F] 907.2.12.1, [F] 907.2.12.1.1 (New), [F] 907.2.12.1.2 (New)]

Proponent: Gene Boecker, Code Consultants, Inc.

Revise as follows:

907.2.12.1 (IBC [F] 907.2.12.1) (Supp) Automatic fire detection. Automatic smoke detection in high rise buildings shall be in accordance with Sections 907.2.12.1.1 and 907.2.12.1.2.

907.2.12.1.1 (IBC [F] 907.2.12.1.1) Area smoke detection. Area smoke detectors shall be provided in accordance with this section. Smoke detectors shall be connected to an automatic fire alarm system. The activation of any detector required by this section shall operate the emergency voice/alarm communication system in accordance with Section 907.6.2.2. Smoke detectors shall be located as follows:

1. In each mechanical equipment, electrical, transformer, telephone equipment or similar room which is not provided with sprinkler protection, ~~elevator machine rooms, and in elevator lobbies.~~
2. In each elevator machine room and in elevator lobbies.

907.2.12.1.2 (IBC [F] 907.2.12.1.2) Duct smoke detection. Duct smoke detectors complying with Section 907.4.1 shall be located as follows:

- ~~2.~~ 1. In the main return air and exhaust air plenum of each air-conditioning system having a capacity greater than 2,000 cubic feet per minute (cfm) (0.94 m³/s). Such detectors shall be located in a serviceable area downstream of the last duct inlet.
- ~~3.~~ 2. At each connection to a vertical duct or riser serving two or more stories from a return air duct or plenum of an air-conditioning system. In Group R-1 and R-2 occupancies, a smoke detector is allowed to be used in each return-air riser carrying not more than 5,000 cfm (2.4m³/s) and serving not more than 10 air-inlet openings.

Reason: Section 907 evolved as an amalgamation of the three legacy codes. Although Section 907 was revised during the last cycle some additional items have been identified that need clarification. The charging statement for Occupancy Groups is inconsistent. The text that indicates what is required is inconsistent. And, the general arrangement of text, although in a logical format, is not consistent with the way many people approach the code. Nor is it consistent with the way that Section 903 is organized. The proposal is an effort made by a group of people from various segments of the industry and code application to correlate, reformat and generally improve usability of the code. Before addressing the technical and formatting changes involved in the proposal, it is worth noting appreciation to the people who helped work on this effort. In alphabetical order:

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 Dan Nichols (Building Codes Division; State of New York),
 Jim Schifiliti (Fire Safety Consultants, Inc)

Justification for proposal for Section 907.2.12.1: Item 2 is added to avoid confusion with the requirements of item 1. Elevator machine rooms and elevator lobbies are required to have smoke detectors for elevator recall even if these locations are sprinklers. By moving them to a separate line, it should reduce confusion in interpretations in this code.

Justification for proposal for Section 907.2.12.1.2: A separate duct smoke detection section is being added to avoid confusion and to clarify that the type of smoke detector used shall be approved for duct applications (higher air velocities, temperatures and humidity) and to allow the use of a supervisory signal in lieu of a fire alarm signal (emergency voice alarm/communication notification).

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The proposal was approved because the committee felt that it provides needed clarification of the automatic fire detection and duct smoke detection systems for high-rise buildings.

Assembly Action:

None

Final Hearing Results

F169-07/08

AS

Code Change No: F172-07/08

Original Proposal

Sections: 907.2.18.1 (IBC [F] 907.2.18.1)

Proponent: Gene Boecker, Code Consultants, Inc.

Delete without substitution:

~~**907.2.18.1 (IBC [F] 907.2.18.1) (Supp) Public address system.** Where a fire alarm system is not required by Section 907.2, a public address system shall be provided which shall be capable of transmitting voice communications to the highest level of exit discharge serving the underground portions of the structure and all levels below.~~

Reason: Section 907 evolved as an amalgamation of the three legacy codes. Although Section 907 was revised during the last cycle some additional items have been identified that need further clarification. The charging statement for Occupancy Groups is inconsistent. The text that indicates what is required is inconsistent. And, the general arrangement of text, although in a logical format, is not consistent with the way many people approach the code. Nor is it consistent with the way that Section 903 is organized. The proposal is an effort made by a group of people from various segments of the industry and code application to correlate, reformat and generally improve usability of the code. Before addressing the technical and formatting changes involved in the proposal, it is worth noting appreciation to the people who helped work on this effort. In alphabetical order:

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Dan Nichols (Building Codes Division; State of New York),
Jim Schifiliti (Fire Safety Consultants, Inc)

This is a 'do-loop' and old language. The 'do-loop' is that an automatic smoke detection system is required by 907.2 (namely 907.2.17), so 907.2.18.1 is not needed. Also, if a reason was found where an automatic detection system isn't needed, the PA system is in direct conflict with the EVACS system found in 907.2.18 for deep underground buildings.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The committee agreed that the proponent's reason statement accurately and adequately substantiates the need for the change, which deletes an unneeded and unenforceable section.

Assembly Action:

None

Final Hearing Results

F172-07/08

AS

Code Change No: **F173-07/08**

Original Proposal

Sections: 907.2.21 (IBC [F] 907.2.21)

Proponent: Gene Boecker, Code Consultants, Inc.

Revise as follows:

907.2.21 (IBC [F] 907.2.21) (Supp) Airport traffic control towers. An automatic fire detection system that activates the occupant notification system in accordance with Section 907.6 shall be provided in airport control towers in all occupiable and equipment spaces.

Exception: Audible appliances shall not be installed within the control tower cab.

Reason: Section 907 evolved as an amalgamation of the three legacy codes. Although Section 907 was revised during the last cycle some additional items have been identified that need clarification. The charging statement for Occupancy Groups is inconsistent. The text that indicates what is required is inconsistent. And, the general arrangement of text, although in a logical format, is not consistent with the way many people approach the code. Nor is it consistent with the way that Section 903 is organized. The proposal is an effort made by a group of people from various segments of the industry and code application to correlate, reformat and generally improve usability of the code. Before addressing the technical and formatting changes involved in the proposal, it is worth noting appreciation to the people who helped work on this effort. In alphabetical order:

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 Dan Nichols (Building Codes Division; State of New York),
 Jim Schifiliti (Fire Safety Consultants, Inc)

The proposed changes to 907.2.21 are to provide clarification as to where fire alarm devices and appliances are required within airport traffic control towers. Equipment spaces have been added as these may be areas within an airport traffic control tower where a fire may begin, but may not be occupied. Early warning of a fire in these areas is required so as to alert the occupants of occupancy and emergency forces.

Due to the nature of the operation of airport traffic control towers, the notification of occupants within the cab is to be by visual notification appliances only.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Modified

Modify the proposal as follows:

907.2.21 (IBC [F] 907.2.21) (Supp) Airport traffic control towers. An automatic ~~fire~~ smoke detection system that activates the occupant notification system in accordance with Section 907.6 shall be provided in airport control towers in all occupiable and equipment spaces.

Exception: Audible appliances shall not be installed within the control tower cab.

Committee Reason: The proposal was approved because the committee felt that it recognizes the critical need for quiet in air traffic control tower cabs. The modification provides correlation of the terminology in this section with the terminology established by code change F163-07/08.

Assembly Action:

None

Final Hearing Results

F173-07/08

AM

Code Change No: F174-07/08

Original Proposal

Sections: 907.2.22 (IBC [F] 907.2.22)

Proponent: Gene Boecker, Code Consultants, Inc.

Revise as follows:

907.2.22 (IBC [F] 907.2.22) (Supp) Battery rooms. An automatic smoke detection system shall be installed in areas containing stationary storage battery systems with a liquid capacity of more than 50 gallons (189 L). ~~The detection system shall activate a local alarm signal at a constantly attended location or shall be supervised by an approved central, proprietary, or remote station service.~~

Reason: Section 907 evolved as an amalgamation of the three legacy codes. Although Section 907 was revised during the last cycle some additional items have been identified that need clarification. The charging statement for Occupancy Groups is inconsistent. The text that indicates what is required is inconsistent. And, the general arrangement of text, although in a logical format, is not consistent with the way many people approach the code. Nor is it consistent with the way that Section 903 is organized. The proposal is an effort made by a group of people from various segments of the industry and code application to correlate, reformat and generally improve usability of the code. Before addressing the technical and formatting changes involved in the proposal, it is worth noting appreciation to the people who helped work on this effort. In alphabetical order:

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Jim Schifiliti (Fire Safety Consultants, Inc)

This is in conflict with IFC Section 907.7.5 (Supp) regarding monitoring. A battery room does not have any special conditions that should give the local alarm option since IFC 907.7.5 (Supp) does not permit any other automatic smoke detection system from utilizing a local alarm only.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The proposal was approved because the committee felt that it deletes text that is in conflict with the alarm monitoring requirements of Section 907.

Assembly Action:

None

Final Hearing Results

F174-07/08

AS

Code Change No: **F179-07/08**

Original Proposal

Sections: 907.4.1 (IBC [F] 907.4.1)

Proponent: Gene Boecker, Code Consultants, Inc.

Revise as follows:

907.4.1 (IBC [F] 907.4.1) (Supp) Duct smoke detectors. Smoke detectors installed in ducts shall be listed for the air velocity, temperature and humidity present in the duct. Duct smoke detectors shall be connected to the building's fire alarm control unit when a fire alarm system is required by 907.2. Activation of a duct smoke detector shall initiate a visible and audible supervisory signal at a constantly attended location and shall perform the intended fire safety function in accordance with this code and the *International Mechanical Code*. Duct smoke detectors shall not be used as a substitute for required open area detection.

Exceptions:

1. The supervisory signal at a constantly attended location is not required where duct smoke detectors activate the buildings alarm notification appliances.
2. In occupancies not required to be equipped with a fire alarm system, actuation of a smoke detector shall activate a visible and an audible signal in an approved location. Smoke detector trouble conditions shall activate a visible or audible signal in an approved location and shall be identified as air duct detector trouble.

Reason: Section 907 evolved as an amalgamation of the three legacy codes. Although Section 907 was revised during the last cycle some additional items have been identified that need clarification. The charging statement for Occupancy Groups is inconsistent. The text that indicates what is required is inconsistent. And, the general arrangement of text, although in a logical format, is not consistent with the way many people approach the code. Nor is it consistent with the way that Section 903 is organized. The proposal is an effort made by a group of people from various segments of the industry and code application to correlate, reformat and generally improve usability of the code. Before addressing the technical and formatting changes involved in the proposal, it is worth noting appreciation to the people who helped work on this effort. In alphabetical order:

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Bill Hopple (SimplexGrinnell),
Dan Nichols (Building Codes Division; State of New York),
Jim Schifiliti (Fire Safety Consultants, Inc)

This section is being modified to clarify that duct smoke detectors shall be listed for the air velocity, temperature and humidity present in the duct system (due to the higher air velocities, temperatures and humidity's inside HVAC ducts) and to correlate with the fire safety function requirements of the International Mechanical Code (HVAC shut-down and fire-smoke damper activation). The language in this proposal is also consistent with the requirements of NFPA 72.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The proposal was approved because the committee felt that it provides a clear statement that duct smoke detectors must be suitable and listed for the environment within the duct system.

Assembly Action:

None

Final Hearing Results

F179-07/08

AS

Code Change No: **F180-07/08**

Original Proposal

Sections: 907.5.3, 907.5.3.1 (New) [IBC [F] 907.5.3, [F] 907.5.3.1 (New)]

Proponent: Gene Boecker, Code Consultants, Inc.

Revise as follows:

907.5.3 (IBC [F] 907.5.3) (Supp) Automatic smoke detection. An automatic smoke detection system shall utilize ~~The automatic fire detectors shall be smoke detectors. Where unless ambient conditions prohibit such an~~ installation. of smoke detectors; In spaces where smoke detectors are not utilized, other approved automatic fire ~~detection shall be permitted required. Where an automatic sprinkler protection system installed in such areas in~~ accordance with Section 903.3.1.1 or 903.3.1.2 is provided and connected to the building fire alarm system, ~~automatic heat detection required by this section shall not be required.~~

907.5.3.1 (IBC [F] 907.5.3.1)Automatic sprinkler system. In areas where ambient conditions prohibit the ~~installation of smoke detectors, an automatic sprinkler system installed in such areas in accordance with Section~~ 903.3.1.1 or 903.3.1.2 and connected to the fire alarm system shall be approved as automatic fire detection.

Exception: Heat detectors for elevator functions.

Reason: Section 907 evolved as an amalgamation of the three legacy codes. Although Section 907 was revised during the last cycle some additional items have been identified that need clarification. The charging statement for Occupancy Groups is inconsistent. The text that indicates what is required is inconsistent. And, the general arrangement of text, although in a logical format, is not consistent with the way many people approach the code. Nor is it consistent with the way that Section 903 is organized. The proposal is an effort made by a group of people from various segments of the industry and code application to correlate, reformat and generally improve usability of the code. Before addressing the technical and formatting changes involved in the proposal, it is worth noting appreciation to the people who helped work on this effort. In alphabetical order:

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Dan Nichols (Building Codes Division; State of New York),
Jim Schifiliti (Fire Safety Consultants, Inc)

This is an attempt to clean up the language regarding automatic smoke detection. The purpose is to drive home that automatic smoke detection systems use smoke detectors unless they are not able to be installed because of the space being served. Also, it spins off the automatic sprinkler system tradeoff to make it an approved use in place of smoke detectors when the area cannot be served with smoke detectors and the system is connected to the fire alarm system. The exception listed as part of the proposed sprinkler system tradeoff section is so the code user does not utilize this section for the prescriptive elevator requirements in ASME A17.1 for the specialized fire safety functions regulated therein.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The proposal was disapproved because the committee felt that it does not provide the clarity desired by the proponent and would cause confusion in the application of the section.

Assembly Action:

None

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Gene Boecker, Code Consultants, Inc., representing himself, requests Approval as Modified by this public comment.

Modify proposal as follows:

907.5.3 (IBC [F] 907.5.3) (Supp) Automatic smoke detection. ~~Where an~~ An automatic smoke detection system is required it shall utilize smoke detectors unless ambient conditions prohibit such an installation. In spaces where smoke detectors are cannot be utilized due to ambient conditions, ~~other approved automatic fire heat detectors detection~~ shall be ~~required~~ permitted.

907.5.3.1 (IBC [F] 907.5.3.1) Automatic sprinkler system. For conditions other than specific fire safety functions noted in Section 907.4, in ~~in~~ areas where ambient conditions prohibit the installation of smoke detectors, an automatic sprinkler system installed in such areas in accordance with Section 903.3.1.1 or 903.3.1.2 ~~and that is~~ connected to the fire alarm system shall be approved as automatic ~~fire~~ heat detection.

~~Exception: Heat detectors for elevator functions.~~

Commenter's Reason: The language intent in the original proposal is incorporated into the single section. Consistent with the other code changes this year, the distinction is made between smoke detection and "fire alarm." The application whereby heat detection is permitted is included but clarified so that sprinklers cannot be used as a substitution for specific heat detectors required in Section 907.4. This is consistent with current intent.

While there may yet be a need to clean up some of the interpretation applications it is important to get the "fire alarm" language out of the code since it is being deleted elsewhere and will no longer have relevance. This maintains the status quo in application while cleaning up the language for the 2009 edition.

Final Hearing Results

F180-07/08

AMPC

Code Change No: **F189-07/08**

Original Proposal

Sections: 909.11 (IBC [F] 909.11)

Proponent: Robert J. Davidson, Davidson Code Concepts, LLC, representing himself

Revise as follows:

909.11 (IBC [F] 909.11) (Supp) Power systems. The smoke control system shall be supplied with two sources of power. Primary power shall be the normal building power systems. Secondary power shall be from an approved standby source complying with the International Code Council *Electrical Code Administrative Provisions*. The standby power source and its transfer switches shall be in a room separate from the normal power transformers and switch gear and ventilated directly to and from the exterior. The room shall be enclosed with not less than 1-hour fire barriers constructed in accordance with Section 706 of the *International Building Code* or horizontal assemblies constructed in accordance with Section 711 of the *International Building Code*, or both. ~~Power distribution from the two sources shall be by independent routes.~~ Transfer to full standby power shall be automatic and within 60 seconds of failure of the primary power. The systems shall comply with this code or the International Code Council *Electrical Code Administrative Provisions*.

Reason: This deletion is being recommended from a practical standpoint. The section requires that the stand-by power source and the transfer switches be in a room separate from the normal power transformers and switch gear.

Both the normal power supply and the stand-by power supply are controlled by the transfer switches. The power to the various devices and equipment that make up the smoke control system are distributed from the transfer switches.

That being the case, how can you distribute power from the two sources independently? To do so would require the power supply to go to a transfer switch located at each device or piece of equipment.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The proposal was approved because the committee felt that it deletes problematic, unenforceable code text.

Assembly Action:

None

Final Hearing Results

F189-07/08

AS

Code Change No: F193-07/08

Original Proposal

Sections: 910.2 (IBC [F] 910.2)

Proponent: Rick Thornberry, PE, The Code Consortium, representing AAMA Smoke Vent Task Group

Revise as follows:

910.2 (IBC [F] 910.2) Where required. Smoke and heat vents shall be installed in the roofs and draft curtains shall be installed on the underside of roofs of one-story buildings or portions thereof occupied for the uses set forth in Sections 910.2.1 through 910.2.3.

Reason: This is an editorial clarification to provide for a charging requirement that draft curtains are required to be installed under the provisions of this section as are smoke and heat vents.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The committee felt that the proposal could create confusion in that it appears to require draft curtain in all cases whereas Chapter 23 allows certain exceptions. It was also felt that that the subject matter should be located in Section 910.3.5.

Assembly Action:

None

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Rick Thornberry, The Code Consortium, Inc., representing AAMA Smoke Vent Task Group, requests Approval as Modified by this public comment.

Replace proposal as follows:

910.3.5 (IBC [F] 910.3.5) Draft curtains. Where required by Table 910.3, draft curtains shall be ~~provided~~ installed on the underside of the roof in accordance with this section.

Exception: Where areas of buildings are equipped with ESFR sprinklers, draft curtains shall not be provided within these areas. Draft curtains shall only be provided at the separation between the ESFR sprinklers and the conventional sprinklers.

Commenter's Reason: Based on the Committee's suggestion made in its Reason for disapproval of the original code change proposal, we are submitting this Public Comment. Instead of revising Section 910.2, we are proposing to revise Section 910.3.5 Draft Curtains as indicated in the Committee's Reason statement. This is an editorial clarification which indicates that the draft curtains are to be installed on the underside of the

roof. Although this may be obvious, there is no definition for draft curtain, nor any other indication that draft curtains are to be installed on the underside of roofs. However, it is a basic assumption made by designers and installers who provides draft curtains in conjunction with smoke and heat vents.

Final Hearing Results

F193-07/08

AMPC

Code Change No: F194-07/08

Original Proposal

Table 910.3 (IBC [F] Table 910.3)

Proponent: Rick Thornberry, PE, The Code Consortium, representing AAMA Smoke Vent Task Group

Revise table footnote as follows:

**TABLE 910.3 (IBC TABLE [F] 910.3)
REQUIREMENTS FOR DRAFT CURTAINS AND SMOKE AND HEAT VENTS^a**

(Portions of table not shown remain unchanged)

For SI: 1 foot = 304.8 mm, 1 square foot = 0.0929m².

- a. ~~Requirements for rack storage heights in excess of those indicated shall be in accordance with Chapter 23. For solid-piled storage heights in excess of those indicated, an approved engineered design shall be used.~~
- b. The distance specified is the maximum distance from any vent in a particular draft curtained area to walls or draft curtains which form the perimeter of the draft curtained area.
- c. Where draft curtains are not required, the vent area to floor area ratio shall be calculated based on a minimum draft curtain depth of 6 feet (Option 1).
- d. "H" is the height of the vent, in feet, above the floor.

Reason: Chapter 23 does not contain specific requirements for smoke and heat vents. It refers to Section 910.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The committee felt that Note a serves valuable function in directing the code user to Chapter 23, notable Section 2308.5, and should be retained

Assembly Action:

None

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Rick Thornberry, The Code Consortium, Inc., representing AAMA Smoke Vent Task Group, requests Approval as Modified by this public comment.

Replace proposal as follows:

**TABLE 910.3 (IBC TABLE [F] 910.3)
REQUIREMENTS FOR DRAFT CURTAINS AND SMOKE AND HEAT VENTS^a**

(Portions of table not shown remain unchanged)

For SI: 1 foot = 304.8 mm, 1 square foot = 0.0929 m²

- Additional requirements for rack storage heights in excess of those indicated shall be in accordance with Chapter 23. For solid-piled storage heights in excess of those indicated, an approved engineered design shall be used.
- The distance specified is the maximum distance from any vent in a particular draft curtained area to walls or draft curtains which form the perimeter of the draft curtained area.
- Where draft curtains are not required, the vent area to floor area ratio shall be calculated based on a minimum draft curtain depth of 6 feet (Option 1).
- "H" is the height of the vent, in feet, above the floor.

Commenter's Reason: We agree with the Committee's concerns expressed in their Reason for disapproving this code change that the reference to Chapter 23 for rack storage heights in excess of those indicated in the table as noted in Footnote a serves a valuable function. However, the purpose for us deleting the reference was that there were no specific requirements that addressed smoke and heat vents and/or draft curtains. Therefore, we felt that it was an unnecessary reference within the context of the Table and Section 910. To remedy this and to clarify the code reference, we have proposed this Public Comment which slightly revises Footnote a to indicate that Chapter 23 should be referred to for "additional" requirements for those rack storage heights in excess of those indicated in the table. This will alert the user of the code to the fact that there are other requirements that should be considered in addition to those for the smoke and heat vents specified in Table 910.3 for these very rack storage facilities. Yet they will not need to refer to Chapter 23 for any additional criteria for smoke and heat vents or draft curtains.

Final Hearing Results

F194-07/08

AMPC

Code Change No: F195-07/08

Original Proposal

Table 910.3 (IBC [F] Table 910.3)

Proponent: Rick Thornberry, PE, The Code Consortium, representing AAMA Smoke Vent Task Group

Revise table column heading and footnote as follows:

**TABLE 910.3 (IBC TABLE [F] 910.3)
REQUIREMENTS FOR DRAFT CURTAINS AND SMOKE AND HEAT VENTS^a**

OCCUPANCY GROUP AND COMMODITY CLASSIFICATION	DESIGNATED STORAGE HEIGHT (feet)	MINIMUM DRAFT CURTAIN DEPTH (feet)	MAXIMUM AREA FORMED BY DRAFT CURTAINS (square feet)	VENT-AREA-TO FLOOR-AREA RATIO ^c	MAXIMUM SPACING OF VENT CENTERS (feet)	MAXIMUM DISTANCE TO <u>FROM</u> VENTS FROM TO WALL OR DRAFT CURTAIN ^b (feet)
--	----------------------------------	------------------------------------	---	--	--	---

(Portions of table not shown remain unchanged)

For SI: 1 foot = 304.8 mm, 1 square foot = 0.0929m².

- Requirements for rack storage heights in excess of those indicated shall be in accordance with Chapter 23. For solid-piled storage heights in excess of those indicated, an approved engineered design shall be used.
- ~~The distance specified is the maximum distance from any vent in a particular draft curtained area to walls or draft curtains which form the perimeter of the draft curtained area.~~ Vents adjacent to walls or draft curtains shall be located within a horizontal distance not greater than the maximum distance specified in this column as measured perpendicular to the wall or draft curtain that forms the perimeter of the draft curtained area.
- Where draft curtains are not required, the vent area to floor area ratio shall be calculated based on a minimum draft curtain depth of 6 feet (Option 1).
- "H" is the height of the vent, in feet, above the floor.

CODE CHANGES RESOURCE COLLECTION – INTERNATIONAL BUILDING CODE

Reason: This proposal is for editorial clarity. Not every vent is required to be within the specified maximum distance from a wall or draft curtain. That limitation is only applicable to those vents adjacent to the walls or draft curtains and not to other vents located in the middle of the draft curtained area.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The committee agreed that the proponent's reason statement accurately and adequately substantiates the need for the change, which clarifies the intent of the code with regard to vent spacing.

Assembly Action:

None

Final Hearing Results

F195-07/08

AS

Code Change No: F198-07/08

Original Proposal

Sections: 910.3.4 (IBC [F] 910.3.4)

Proponent: Rick Thornberry, PE, The Code Consortium, representing AAMA Smoke Vent Task Group

Revise as follows:

910.3.4 (IBC [F] 910.3.4) (Supp) Vent locations. Smoke and heat vents shall be located 20 feet (6096 mm) or more from adjacent lot lines and fire walls and 10 feet (3048 mm) or more from fire barriers. Vents shall be uniformly located within the roof area ~~above high-piled storage areas,~~ with consideration given to roof pitch, draft curtain location, sprinkler location and structural members.

Reason: Editorial clarification. This requirement should apply in all cases, not just for high piled storage areas.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The committee felt that the proposal could lead to vents being required throughout all roof areas, even where they would serve no useful purpose.

Assembly Action:

None

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Rick Thornberry, The Code Consortium, Inc., representing AAMA Smoke Vent Task Group, requests Approval as Modified by this public comment.

Modify proposal as follows:

910.3.4 (IBC [F] 910.3.4) (Supp) Vent locations. Smoke and heat vents shall be located 20 feet (6096 mm) or more from adjacent lot lines and fire walls and 10 feet (3048 mm) or more from fire barriers. Vents shall be uniformly located within the roof in the areas of the building where the vents are required to be installed by Section 910.2 with consideration given to roof pitch, draft curtain location, sprinkler location and structural members.

Commenter's Reason: This Public Comment responds to the Committee's Reason for disapproving the original code change proposal. The Committee was concerned that the original revisions to this section would have caused vents to be required throughout all roof areas in the building, even in areas where they would serve no useful purpose or were not otherwise required. So we have revised the code change proposal so that it clearly indicates that the vents are only to be installed in those areas of the building where the vents are required by Section 910.2. The important point of this revision is that the vents must be uniformly located within the roof in those areas where vents are to be provided and not just where they are located above high-piled storage areas.

Final Hearing Results

F198-07/08

AMPC

Code Change No: F199-07/08

Original Proposal

Sections: 910.3.5 (IBC [F] 910.3.5)

Proponent: Edwin M. Berkel, CFI, Mehlville Fire Protection District, representing himself

Revise as follows:

910.3.5 (IBC [F] 910.3.5) Draft curtains. Where required, draft curtains shall be provided in accordance with this section.

Exception: Where areas of buildings are equipped with ESFR sprinklers, draft curtains shall not be provided within these areas. Draft curtains shall only be provided at the separation between the ESFR sprinklers and the ~~conventional~~ standard response sprinklers

Reason: The existing code text makes use of an undefined term, "conventional sprinklers". This code change corrects that by using "standard response sprinklers" which is the correct term utilized in the reference standards.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:**Approved as Submitted**

Committee Reason: The committee agreed that the proponent's reason statement accurately and adequately substantiates the need for the change, which provides clarification by using correct sprinkler terminology in the correct manner.

Assembly Action:**None**

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Bob Eugene, Underwriters Laboratories, Inc., requests Approval as Modified by this public comment.

Modify proposal as follows:

910.3.5 (IBC [F] 910.3.5) Draft curtains. Where required, draft curtains shall be provided in accordance with this section.

Exception: Where areas of buildings are equipped with ESFR sprinklers, draft curtains shall not be provided within these areas. Draft curtains shall only be provided at the separation between the ESFR sprinklers and the ~~standard response~~ non-ESFR sprinklers.

Commenter's Reason: The approved code text uses "standard response sprinklers" which is the correct term utilized in the reference standards, but might limit some of the sprinkler response technology. The intent is to limit the early response of sprinklers using different response technology and this change will provide an unlimited array of sprinklers that maybe found in High-piled storage arrangement.

Final Hearing Results

F199-07/08

AMPC

Code Change No: F201-07/08

Original Proposal

Sections: 912.2.1 (IBC [F] 912.2.1)

Proponent: Tom Lariviere, Fire Department, Madison, MS, representing Joint Fire Service Review Committee

Revise as follows:

912.2.1 (IBC [F] 912.2.1) Visible location. Fire department connections shall be located on the street side of buildings, fully visible and recognizable from the street or nearest point of fire department vehicle access or as otherwise approved by the fire ~~code official~~ chief.

Reason: Item F132-06/07, Section 912.2 received a lengthy debate and committee modification which subsequently received membership approval at the final action hearings in NY. The final revision to IFC 912.2 requires that the FDC is located as required by the fire chief and reads as follows:

912.2 Location. With respect to hydrants, driveways, buildings and landscaping, fire department connections shall be so located that fire apparatus and hose connected to supply the system will not obstruct access to the buildings for other fire apparatus. The location of fire department connections shall be approved by the fire chief.

The proposed revision to IFC 912.2.1 merely correlates with the revision to IFC 912.2 and eliminates conflict between the two sections.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The committee agreed that the proponent's reason statement accurately and adequately substantiates the need for the change, which properly changes the approval authority from the fire code official to the fire chief since fire department connection location is a fire department operational issue.

Assembly Action:

None

Final Hearing Results

F201-07/08

AS

Code Change No: F202-07/08

Original Proposal

Sections: 912.4 (IBC [F] 912.4)

Proponent: Tom Lariviere, Fire Department, Madison, MS, representing Joint Fire Service Review Committee

Revise as follows:

912.4 (IBC [F] 912.4) Signs. An metal approved permanent sign with raised letters at least 1 inch (25 mm) in size shall be mounted on all new and existing fire department connections serving automatic sprinklers, standpipes or fire pump connections. Such signs shall read: AUTOMATIC SPRINKLERS or STANDPIPES or TEST CONNECTION or a combination thereof as applicable. Where the fire department connection does not serve the entire building, a sign shall be provided indicating the portions of the building served.

Reason: Many sprinkler and standpipe systems were installed prior to current standards. Furthermore, standpipe systems are currently allowed to be manual or automatic in non high-rise buildings as well as many buildings have partial sprinkler or standpipe systems.

The purpose of the sign is to provide the responding firefighters with the correct information on which portions of a building are served by the fire department connection. Many buildings include multiple sets of fire department connections which are not interconnected. Some examples include:

1. Separate connections for the building sprinkler system and the dry standpipe system in open parking structures
2. Rehabilitated buildings where a sprinkler system is only installed on certain floors
3. A high-rise building constructed prior to the adoption of a building code that has a manual wet system

Signs are also required in NFPA 14, and this proposal will allow the raised letter sign to be provided as indicated in NFPA 14 or provide another sign. Many departments are requiring other signs which are more descriptive and provide more information than the minimal sign required in NFPA 14.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Modified

Modify the proposal as follows:

912.4 (IBC [F] 912.4) Signs. An metal approved permanent sign with raised letters at least 1 inch (25 mm) in size shall be mounted on all new and existing fire department connections serving automatic sprinklers, standpipes or fire pump connections. Such signs shall read: AUTOMATIC SPRINKLERS or STANDPIPES or TEST CONNECTION or a combination thereof as applicable. Where the fire department connection does not serve the entire building, a sign shall be provided indicating the portions of the building served.

Committee Reason: The committee agreed that the proponent's reason statement accurately and adequately substantiates the need for the change, which will provide important information to the fire department as to which of multiple fire department connections should be used. The modification retains the current text of the first sentence of the section for correlation with the requirements of NFPA 13.

Assembly Action:

None

Final Hearing Results

F202-07/08

AM

Code Change No: **F203-07/08**

Original Proposal

Sections: 913.2.1 (New) [IBC 913.2.1 (New)]

Proponent: Phillip Brazil, PE, Reid Middleton, Inc., representing himself

1. (IFC) Add new text as follows:

913.2 Protection against interruption of service. The fire pump, driver, and controller shall be protected in accordance with NFPA 20 against possible interruption of service through damage caused by explosion, fire, flood, earthquake, rodents, insects, windstorm, freezing, vandalism and other adverse conditions.

913.2.1 Protection of fire pump rooms. Rooms where fire pumps are located shall be separated from all other areas of the building in accordance with the *International Building Code*.

2. (IBC) Add new text as follows:

[F] 913.2 [Supp] Protection against interruption of service. The fire pump, driver, and controller shall be protected in accordance with NFPA 20 against possible interruption of service through damage caused by explosion, fire, flood, earthquake, rodents, insects, windstorm, freezing, vandalism and other adverse conditions.

[F] 913.2.1 Protection of fire pump rooms. Fire pumps shall be located in rooms that are separated from all other areas of the building by 2-hour fire barriers constructed in accordance with Section 706 or 2-hour horizontal assemblies constructed in accordance with Section 711, or both.

Exceptions:

1. In other than high-rise buildings, separation by 1-hour fire barriers constructed in accordance with Section 706 or 1-hour horizontal assemblies constructed in accordance with Section 711, or both, shall be permitted in buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2.
2. Separation is not required for fire pumps physically separated in accordance with NFPA 20.

Reason: The Standard for the Installation of Stationary Pumps for Fire Protection, NFPA 20, specifies protection for indoor fire pumps by means of physical or fire separation. I assume the 2007 edition of NFPA 20 will be the edition that is referenced in the 2009 IBC and IFC. Section 5.12.1.1 of NFPA 20 specifies physical separation or protection by fire-rated construction. I interpret “fire-rated construction” to be a reference to separation by a fire barrier, horizontal assembly, or both. Section 5.12.1.1.1 specifies a 2-hour fire-resistance rating for the separation in high-rise buildings but is silent on the physical separation distance. Table 5.12.1.1.2 specifies the physical separation distances and fire-resistance ratings for nonhigh-rise buildings. A 2-hour fire-resistance rating for the separation is specified except for fully sprinklered buildings and pump rooms/houses (i.e., equipped throughout with an automatic sprinkler system complying with NFPA 13 or NFPA 13R). A minimum physical separation distance of 50 feet is specified in all cases and, presumably, would apply when physical separation is utilized in a high-rise building.

By referencing NFPA 20 in the IBC, the physical or fire separation specified in Section 5.12.1.1 of NFPA 20 becomes a construction requirement. The purpose of this proposal is to specify the fire separation as a requirement in the IBC so that designers and building officials are made aware of it. The proposed language will also clarify what is required. The reference to separation by “fire-rated construction” in NFPA 20 does not make it clear what is required for protection of the separating walls and horizontal assemblies at openings, penetrations, joints, ducts and air transfer openings. It is also silent on requirements for continuity, where one or more of the separating walls is an exterior wall, and where one of the horizontal assemblies is a roof assembly. Specifying fire barriers and horizontal assemblies makes it clear what is required by virtue of their provisions in Sections 706 and 711, respectively.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The committee agreed that the proponent's reason statement accurately and adequately substantiates the need for the change, which will provide an increased level of fire pump reliability by enclosing them in a fire-resistance rated pump room using requirements correlated with NFPA 20.

Assembly Action:

None

Final Hearing Results

F203-07/08

AS

Code Change No: F219-07/08

Original Proposal

Sections: 1802.1 (IBC [F] 415.2), 2703.2.2.1

Proponent: Doug Hall, Fire Department, City of Westminster, CO, representing Fire Marshal's Association of Colorado

Revise as follows:

**SECTION 1802
DEFINITIONS**

1802.1 (IBC [F] 415.2) Definitions. The following words and terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

HAZARDOUS PRODUCTION MATERIAL (HPM). A solid, liquid or gas associated with semiconductor manufacturing that has a degree-of-hazard rating in health, flammability or ~~reactivity~~ instability of Class 3 or 4 as ranked by NFPA 704 and which is used directly in research, laboratory or production processes which have as their end product materials that are not hazardous.

2703.2.2.1 Design and construction. Piping, tubing, valves, fittings and related components used for hazardous materials shall be in accordance with the following:

1. Piping, tubing, valves, fittings and related components shall be designed and fabricated from materials that are compatible with the material to be contained and shall be of adequate strength and durability to withstand the pressure, structural and seismic stress and exposure to which they are subject.
2. Piping and tubing shall be identified in accordance with ASME A13.1 to indicate the material conveyed.
3. Readily accessible manual valves or automatic remotely activated fail-safe emergency shutoff valves shall be installed on supply piping and tubing at the following locations:
 - 3.1. The point of use.
 - 3.2. The tank, cylinder or bulk source.
4. Manual emergency shutoff valves and controls for remotely activated emergency shutoff valves shall be identified and the location shall be clearly visible, accessible and indicated by means of a sign.
5. Backflow prevention or check valves shall be provided when the backflow of hazardous materials could create a hazardous condition or cause the unauthorized discharge of hazardous materials.
6. Where gases or liquids having a hazard ranking of:

Health hazard Class 3 or 4
Flammability Class 4
~~Reactivity~~ Instability Class 3 or 4

in accordance with NFPA 704 are carried in pressurized piping above 15 pounds per square inch gauge (psig) (103 kPa), an approved means of leak detection and emergency shutoff or excess flow control shall be provided. Where the piping originates from within a hazardous material storage room or area, the excess flow control shall be located within the storage room or area. Where the piping originates from a bulk source, the excess flow control shall be located as close to the bulk source as practical.

Exceptions:

1. Piping for inlet connections designed to prevent backflow.
2. Piping for pressure relief devices.

CODE CHANGES RESOURCE COLLECTION – INTERNATIONAL BUILDING CODE

Reason: NFPA 704 no longer recognizes the “Reactivity” label for the applicable classification of hazardous materials. Revising the classification to the current 2007 edition of NFPA 704 terminology reflects exactly what the IFC standards reference states. The use of the term “reactivity” misinforms the intent of this specific classification. Appropriate use of the term “instability” reflects the intent of the current NFPA 704 classification system for fire personnel and industrial emergency responders.

“Reactivity” has been erroneously taught to thousands of emergency responders and private industry users that the numeric rating system quantified the degree of reactivity a chemical might have with other chemicals, i.e. how reactive a chemical is to something else.

Instability directly correlates to the degree of intrinsic susceptibility of materials to release energy when exposed to thermal or mechanical shock and/or elevated temperatures or pressure. There is no direct correlation with a chemical's compatibility to another chemical substance.

There are approximately 16 references in the 2007 IFC to the NFPA 704 standard. The IFC should accurately reflect the information from a standard.

Cost Impact: No direct cost impact to facility users as the NFPA 704 numeric rating system has not changed for instability.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The committee agreed that the proponent's reason statement accurately and adequately substantiates the need for the change, which would provide a useful clarification of the terminology and correlation with NFPA 704.

Assembly Action:

None

Final Hearing Results

F219-07/08

AS

Code Change No: F225-07/08

Original Proposal

Sections: 2201.1, 2202.1 (New), 1103.5, 1106.1; IBC 412.1 (New)

Proponent: Tom Lariviere, Fire Department, Madison, MS, representing Joint Fire Service Review Committee

1. Revise as follows:

2201.1 Scope. Automotive motor fuel-dispensing facilities, marine motor fuel-dispensing facilities, fleet vehicle motor fuel-dispensing facilities aircraft motor-vehicle fuel-dispensing facilities and repair garages shall be in accordance with this chapter and the *International Building Code*, *International Fuel Gas Code* and the *International Mechanical Code*. Such operations shall include both operations that are accessible to the public and private operations.

1103.5 Dispensing of flammable and combustible liquids. The dispensing, transferring and storage of flammable and combustible liquids shall be in accordance with this chapter and Chapter 34. Aircraft motor vehicle fuel-dispensing ~~stations~~ facilities shall be in accordance with Chapter 22.

1106.1 Aircraft motor vehicle fuel-dispensing ~~stations~~ facilities. Aircraft motor vehicle fuel-dispensing ~~stations~~ facilities shall be in accordance with Chapter 22.

2. Add new definition as follows:

2202.1 Definitions. The following words and terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

AIRCRAFT MOTOR-VEHICLE FUEL-DISPENSING FACILITY. That portion of property where flammable or combustible liquids or gases used as motor fuels are stored and dispensed from fixed equipment into the fuel tanks of aircraft.

3. Add new text as follows:

IBC 412.1 General. Aircraft related occupancies shall comply with this section and the *International Fire Code*.

(Renumber subsequent sections)

Reason: The IFC has construction requirements for aircraft related facilities in Chapter 11 Aviation Facilities, however, Section 412 Aircraft-related Occupancies in the IBC does not direct the user to the fire code other than for aircraft paint hangers. The new language proposed for Section 412.1 will provide that reference.

Additionally, IFC Chapter 11 Aviation Facilities requires "Aircraft Motor-Vehicle Fuel-Dispensing Stations" to be installed in accordance with Chapter 22 of that code, however, of all the different types of motor vehicle facilities defined by Chapter 22 and listed in Section 2201.1 Scope, aircraft motor-vehicle fuel-dispensing stations are not included. The proposed language clarifies that these facilities are within the scope of Chapter 22 and provides a definition.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:**Approved as Modified****Modify the proposal as follows:**

2202.1 Definitions. The following words and terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

AIRCRAFT MOTOR-VEHICLE FUEL-DISPENSING FACILITY. That portion of property where flammable or combustible liquids or gases used as motor fuels are stored and dispensed from fixed automotive-type equipment into the fuel tanks of aircraft.

(Portions of proposal not shown remain unchanged)

Committee Reason: The committee agreed that the proponent's reason statement accurately and adequately substantiates the need for the change, which fills the need for defining this type of motor fuel dispensing facility. The modification further clarifies that these facilities, found mainly at small, local airports, use the same type of dispensing equipment as automotive facilities rather than the more sophisticated fuelers and systems found at larger airports.

Assembly Action:**None**

Final Hearing Results

F225-07/08

AM

Code Change No: F233-07/08

Original Proposal

Sections: 2209.5.1.1, Chapter 45 (New); IBC 406.5.2, Chapter 35 (New)

THESE PROPOSALS ARE ON THE AGENDA OF THE IFC AND THE IBC GENERAL CODE DEVELOPMENT COMMITTEES AS 2 SEPARATE CODE CHANGES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

Proponent: Thomas Joseph, Chair, Hydrogen Industry Panel on Codes (HIPOC)

1. PART I – IFC**Revise as follows:**

2209.5.1.1 (Supp) Vehicle fueling pad. The vehicle fueling pad shall be fueled on non-coated or concrete or a other approved paving material having a resistivity resistance not exceeding one megohm as determined by an approved method the methodology specified in DIN EN 1081.

2. Add standard to Chapter 45 as follows:

European Committee for Standardization (EN)
Central Secretariat
Rue de Stassart 36
B-10 50 Brussels

European Standard EN 1081: 1998 Resilient Floor Coverings – Determination of the Electrical Resistance

PART I – IBC GENERAL

406.5.2 (Supp) Vehicle fueling pad. The vehicle ~~fueling pad~~ shall be fueled on non-coated ~~of~~ concrete or a other approved paving material having a resistivity resistance not exceeding 1 megohm as determined by an approved method ~~the methodology specified in DIN EN 1081.~~

2. Add standard to Chapter 35 as follows:

European Committee for Standardization (EN)
Central Secretariat
Rue de Stassart 36
B-10 50 Brussels

European Standard EN 1081: 1998 Resilient Floor Coverings – Determination of the Electrical Resistance

Reason: The proposed changes retain the original intent of this section while correcting some incorrect language and providing additional guidance for the code official. These changes address concerns voiced by ICC members during the last code cycle regarding the specified units and the request for additional guidance for the code official by using a referenced standard.

Units: Megohms are the appropriate measurement of resistance, not resistivity.

Referenced Standard: The referenced EN standard 1081:1998, which now has DIN status, is the best available standard that is applicable to measuring resistance of vehicle fueling pads. With this change the official still has the option to use another approved method, but DIN EN 1081:1998 is the referred method for measurement if non-coated concrete is not used. It may be worth noting that DIN EN 1081:1998 was created using an open, transparent and consensus-based process similar to the procedures used by ANSI-approved standard development organizations. Considering Standard 1081 also bares the EN designation, the U.S. building regulatory community should be comfortable that it has been, and will continue to be, carefully scrutinized and representative of the work of a true consensus body that we Americans are familiar with.

These proposed changes will retain the original intent of this section to dissipate static electricity built up on the vehicle from driving before the driver's door is opened--with corrected language and better guidance. The overall goal is to increase the safety of vehicle fueling. Concrete is allowed for the fueling pad with no resistance measurements needed; if an alternate material is desired, it can be used as long as it has a resistance less than or equal to 1 megohm. Both the concrete and 1 megohm criteria are cited from the American Petroleum Institute (API) 2003 Recommended Practices (RP), section 4.6.9.2. NFPA 77: *Recommended Practice on Static Electricity*, section 7.4.1.3 also points out that a resistance of 1 megohm or less is considered adequate to dissipate any charges. Additionally, the proposed language has been proposed by the State of Michigan, Department of Environmental Quality – Waste and Hazardous Materials Division for Michigan's *Hydrogen Storage and Dispensing Rules*, and is consistent with changes proposed under the current cycle to NFPA 55-2005, *Standard for the Storage, Use, and Handling of Compressed Gasses and Cryogenic Fluids in Portable and Stationary Containers, Cylinders, and Tanks*.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing Results

Note: The following analysis was not in the Code Change Proposal book but was posted on the ICC website.

Analysis: Review of proposed new standard EN 1981:1998 indicated that, in the opinion of ICC Staff, the standard did comply with ICC standards criteria.

PART I – IFC

Committee Action:

Approved as Submitted

Committee Reason: The proposal was approved because the committee felt that the proponent had responded to the committees concerns regarding the way the standard is referenced. That concern was expressed in the committee action on code change F156-07/07 in the last cycle.

Assembly Action:

None

PART II – IBC GENERAL

Committee Action:

Disapproved

Committee Reason: The committee did not receive enough data to determine the applicability of the requirements.

Assembly Action:

None

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted for Part II.

Public Comment:

Thomas Joseph, Chair, Hydrogen Industry Panel on Codes, requests Approval as Submitted.

Commenter's Reason: The Hydrogen Industry asks the Membership to uphold IFC Committee Action on Part I for "As Submitted" and reverse IBC General Committee Action on Part II from "Disapprove" to "As Submitted" for consistency and uniformity in enforcement.

Fifteen (15) copies of the European Standard DIN EN 1081:1998-04, proposing electrostatic discharge (ESD) material and testing requirements for vehicle fueling surfaces were purchased and provided to the IFC Secretariat and Code Development Committee. The Secretariat's analysis indicated DIN EN 1081 was reviewed for compliance with ICC policy and accepted as compliant. Part I was subsequently reviewed and approved by the IFC Development Committee.

Part II was disapproved by IBC General Development Committee, not on technical grounds, but based on (1) Not having received additional copies of the standard and (2) that the IFC Secretariat's review and acceptance of DIN EN 1081 had not been coordinated with the IBC-General Secretariat or the IBC General Committee.

Final Hearing Results

F233-07/08, Part I	AS
F233-07/08, Part II	AS

Code Change No: F241-07/08

Original Proposal

Sections: 2403.8.4 (New); IBC 3102.1

Proponent: Daniel E. Nichols, PE, NY State Division of Code Enforcement and Administration

THESE PROPOSALS ARE ON THE AGENDA OF THE IFC AND THE IBC GENERAL CODE DEVELOPMENT COMMITTEES AS 2 SEPARATE CODE CHANGES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IFC

Add new text as follows:

2403.8.4 Membrane structures on buildings. Membrane structures that are erected on buildings, balconies, decks, or other structures shall be regulated as permanent membrane structures in accordance with Section 3102 of the *International Building Code*.

(Renumber subsequent sections)

PART II – IBC GENERAL

3102.1 General. The provisions of this section shall apply to air-supported, air-inflated, membrane-covered cable and membrane-covered frame structures, collectively known as membrane structures, erected for a period of 180 days or longer. Those erected for a shorter period of time shall comply with the *International Fire Code*. Membrane structures covering water storage facilities, water clarifiers, water treatment plants, sewage treatment plants, greenhouses and similar facilities not used for human occupancy, are required to meet only the requirements of Sections 3102.3.1 and 3102.7. Membrane structures erected on a building, balcony, deck or other structure for any period of time shall comply with this section.

CODE CHANGES RESOURCE COLLECTION – INTERNATIONAL BUILDING CODE

Reason: The purpose of this code proposal is to limit the location where temporary membrane structures can be erected, based on regulations already found in the temporary membrane structure requirements.

Temporary membrane structures that are placed in a field or parking lot are afforded several safety features including fire separation distance from other hazards (buildings, vehicles), separation from other tents, and provide an unobstructed means of egress path for the uniformly located exits. When a membrane structure is placed upon a building or deck, the temporary membrane structure requirements do not currently regulate exiting from the temporary membrane structure to a set of stairs or door nor do they regulate the hazards that could be below the temporary membrane structure. Furthermore, the temporary membrane structure section does not contain requirements on the regulation of the loads temporary membrane structures would have on a structure below.

With the means of egress, fire separation, and structural issues, it is best for temporary membrane structures to be regulated as permanent membrane structures and subject to the International Building Code.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

PART I – IFC

Committee Action:

Approved as Submitted

Committee Reason: The proposal was approved because it provides needed guidance to the fire code official on how membrane structures erected on buildings are to be viewed and regulated. Without this change, they are essentially a building addition without regulation. The action is also consistent with the action taken by the IBC-General Committee on Part II.

Assembly Action:

None

PART II – IBC GENERAL

Committee Action:

Approved as Submitted

Committee Reason: If a membrane is constructed on a building it needs to be regulated. This proposal would clarify between the temporary requirements in the IFC and the permanent membrane requirements in the IBC.

Assembly Action:

None

Final Hearing Results

F241-07/08, Part I	AS
F241-07/08, Part II	AS

Code Change No: **F243-07/08**

Original Proposal

Chapter 24, Section: 105.6.43, 105.7.13, 202 (IBC 202); Table 906.1 (IBC Table [F] 906.1)

Proponent: Tom Lariviere, Fire Department, Madison, MS, representing Joint Fire Service Review Committee

THESE PROPOSALS ARE ON THE AGENDA OF THE IFC AND THE IBC GENERAL CODE DEVELOPMENT COMMITTEES AS 2 SEPARATE CODE CHANGES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IFC

1. Revise Chapter 24 as follows:

CHAPTER 24 TENTS, CANOPIES AND OTHER MEMBRANE STRUCTURES

SECTION 2401 GENERAL

2401.1 (Supp) Scope. Tents, ~~canopies~~ and membrane structures shall comply with this chapter. The provisions of Section 2403 are applicable only to temporary tents, ~~canopies~~ and membrane structures. The provisions of Section 2404 are applicable to temporary and permanent tents, ~~canopies~~ and membrane structures.

SECTION 2402 DEFINITIONS

CANOPY. A structure, enclosure or shelter constructed of fabric or pliable materials supported by any manner, except by air or the contents it protects, and is open without sidewalls or drops on 75 percent or more of the perimeter

TENT. A structure, enclosure or shelter, with or without sidewalls or drops, constructed of fabric or pliable material supported by any manner except by air or the contents that it protects.

SECTION 2403 TEMPORARY TENTS, CANOPIES AND MEMBRANE STRUCTURES

2403.1 General. All temporary tents, ~~canopies~~ and membrane structures shall comply with this section.

2403.2 Approval required. Tents and membrane structures having an area in excess of ~~200~~ 400 square feet (~~19~~ 37 m²) and ~~canopies in excess of 400 square feet (37 m²)~~ shall not be erected, operated or maintained for any purpose without first obtaining a permit and approval from the fire code official.

Exceptions:

1. Tents used exclusively for recreational camping purposes.
2. ~~Fabric canopies~~ Tents open on all sides which comply with all of the following:
 - 2.1. Individual ~~canopies tents~~ having a maximum size of 700 square feet (65 m²).
 - 2.2. The aggregate area of multiple ~~canopies tents~~ placed side by side without a fire break clearance of 2 feet (3658 mm), not exceeding 700 square feet (65 m²) total.
 - 2.3. A minimum clearance of 12 feet (3658 mm) to all structures and other tents.

2403.3 Place of assembly. (No change to current text)

2403.4 Permits. (No change to current text)

2403.5 Use period. Temporary tents, air-supported, air-inflated or tensioned membrane structures ~~and canopies~~ shall not be erected for a period of more than 180 days within a 12-month period on a single premises.

2403.6 Construction documents. A detailed site and floor plan for tents, ~~canopies~~ or membrane structures with an occupant load of 50 or more shall be provided with each application for approval. The ~~tent, canopy~~ or membrane structure floor plan shall indicate details of the means of egress facilities, seating capacity, arrangement of the seating and location and type of heating and electrical equipment.

2403.7 Inspections. (No change to current text)

2403.7.1 Inspection report. (No change to current text)

2403.8 Access, location and parking. Access location and parking for temporary tents, ~~canopies~~ and membrane structures shall be in accordance with this section.

2403.8.1 Access. (No change to current text)

2403.8.2 Location. Tents, ~~canopies~~ or membrane structures shall not be located within 20 feet (6096 mm) of lot lines, buildings, other tents, ~~canopies~~ or membrane structures, parked vehicles or internal combustion engines. For the purpose of determining required distances, support ropes and guy wires shall be considered as part of the temporary membrane structure, or tent ~~or canopy~~.

Exceptions:

1. Separation distance between membrane structures, and tents ~~and canopies~~ not used for cooking, is not required when the aggregate floor area does not exceed 15,000 square feet (1394 m²).
2. Membrane structures, or tents ~~or canopies~~ need not be separated from buildings when all of the following conditions are met:
 - 2.1. The aggregate floor area of the membrane structure, or tent ~~or canopy~~ shall not exceed 10,000 square feet (929 m²).

- 2.2. The aggregate floor area of the building and membrane structure, ~~or tent or canopy~~ shall not exceed the allowable floor area including increases as indicated in the *International Building Code*.
- 2.3. Required means of egress provisions are provided for both the building and the membrane structure, ~~or tent or canopy~~, including travel distances.
- 2.4. Fire apparatus access roads are provided in accordance with Section 503.

2403.8.3 Location of structures in excess of 15,000 square feet in area. (No change to current text)

2403.8.4 Connecting corridors. (No change to current text)

2403.8.5 Fire break. An unobstructed fire break passageway or fire road not less than 12 feet (3658 mm) wide and free from guy ropes or other obstructions shall be maintained on all sides of all tents, ~~canopies~~ and membrane structures unless otherwise approved by the fire code official.

2403.9 Anchorage required. Tents, ~~canopies~~ or membrane structures and their appurtenances shall be adequately roped, braced and anchored to withstand the elements of weather and prevent against collapsing. Documentation of structural stability shall be furnished to the fire code official on request.

2403.10 Temporary air-supported and air-inflated membrane structures. (No change to current text)

2403.10.1 Door operation. (No change to current text)

2403.10.2 Fabric envelope design and construction. (No change to current text)

2403.10.3 Blowers. (No change to current text)

2403.10.4 Auxiliary power. (No change to current text)

2403.11 Seating arrangements. Seating in tents, ~~canopies~~ or membrane structures shall be in accordance with Chapter 10.

2403.12 Means of egress. Means of egress for temporary tents, ~~canopies~~ and membrane structures shall be in accordance with Sections 2403.12.1 through 2403.12.8.

2403.12.1 Distribution. (No change to current text)

2403.12.2 Number. (No change to current text)

**TABLE 2403.12.2
MINIMUM NUMBER OF MEANS OF EGRESS AND MEANS OF
EGRESS WIDTHS FROM TEMPORARY MEMBRANE
STRUCTURES, AND TENTS AND CANOPIES**

OCCUPANT LOAD	MINIMUM NUMBER OF MEANS OF EGRESS	MINIMUM WIDTH OF EACH MEANS OF EGRESS (inches)	MINIMUM WIDTH OF EACH MEANS OF EGRESS (inches)
		Tent or Canopy	Membrane Structure
10 to 199	2	72	36
200 to 499	3	72	72
500 to 999	4	96	72
1,000 to 1,999	5	120	96
2,000 to 2,999	6	120	96
Over 3,000 ^a	7	120	96

For SI: 1 inch = 25.4 mm.

- a. When the occupant load exceeds 3,000, the total width of means of egress (in inches) shall not be less than the total occupant load multiplied by 0.2 inches per person.

2403.12.3 Exit openings from tents. (No change to current text)

2403.12.4 Doors. (No change to current text)

2403.12.5 Aisle. (No change to current text)

2403.12.5.1 Arrangement and maintenance. (No change to current text)

2403.12.6 Exit signs. (No change to current text)

2403.12.6.1 (Supp) Exit sign illumination. (No change to current text)

2403.12.7 Means of egress illumination. (No change to current text)

2403.12.8 Maintenance of means of egress. (No change to current text)

SECTION 2404
TEMPORARY AND PERMANENT TENTS, CANOPIES
AND MEMBRANE STRUCTURES

2404.1 General. All tents, ~~canopies~~ and membrane structures, both temporary and permanent, shall be in accordance with this section. Permanent tents, ~~canopies~~ and membrane structures shall also comply with the *International Building Code*.

2404.2 Flame propagation performance treatment. Before a permit is granted, the owner or agent shall file with the fire code official a certificate executed by an approved testing laboratory certifying that the tents; ~~canopies~~ and membrane structures and their appurtenances; sidewalls, drops and tarpaulins; floor coverings, bunting and combustible decorative materials and effects, including sawdust when used on floors or passageways, shall be composed of material meeting the flame propagation performance criteria of NFPA 701 or shall be treated with a flame retardant in an approved manner and meet the flame propagation performance criteria of NFPA 701, and that such flame propagation performance criteria are effective for the period specified by the permit.

2404.3 Label. Membrane structures, or tents or canopies shall have a permanently affixed label bearing the identification of size and fabric or material type.

2404.4 Certification. An affidavit or affirmation shall be submitted to the fire code official and a copy retained on the premises on which the tent or air-supported structure is located. The affidavit shall attest to the following information relative to the flame propagation performance criteria of the fabric:

1. Names and address of the owners of the tent, ~~canopy~~ or air-supported structure.
2. Date the fabric was last treated with flame-retardant solution.
3. Trade name or kind of chemical used in treatment.
4. Name of person or firm treating the material.
5. Name of testing agency and test standard by which the fabric was tested.

2404.5 (Supp) Combustible materials. Hay, straw, shavings or similar combustible materials shall not be located within any tent, ~~canopy~~ or membrane structure containing an assembly occupancy, except the materials necessary for the daily feeding and caring of animals. Sawdust and shavings utilized for a public performance or exhibit shall not be prohibited provided the sawdust and shavings are kept damp. Combustible materials shall not be permitted under stands or seats at any time.

2404.6 Smoking. Smoking shall not be permitted in tents, ~~canopies~~ or membrane structures. Approved "No Smoking" signs shall be conspicuously posted in accordance with Section 310.

2404.7 Open or exposed flame. Open flame or other devices emitting flame, fire or heat or any flammable or combustible liquids, gas, charcoal or other cooking device or any other unapproved devices shall not be permitted inside or located within 20 feet (6096 mm) of the tent, ~~canopy~~ or membrane structures while open to the public unless approved by the fire code official.

2404.8 Fireworks. Fireworks shall not be used within 100 feet (30 480 mm) of tents, ~~canopies~~ or membrane structures.

2404.9 Spot lighting. (No change to current text)

2404.10 Safety film. Motion pictures shall not be displayed in tents, ~~canopies~~ or membrane structures unless the motion picture film is safety film.

2404.11 (Supp) Clearance. (No change to current text)

2404.12 Portable fire extinguishers. (No change to current text)

2404.13 Fire protection equipment. (No change to current text)

2404.14 Occupant load factors. (No change to current text)

2404.15 Heating and cooking equipment. (No change to current text)

2404.15.1 Installation. (No change to current text)

2404.15.2 Venting. Gas, liquid and solid fuel-burning equipment designed to be vented shall be vented to the outside air as specified in the *International Fuel Gas Code* and the *International Mechanical Code*. Such vents shall be equipped with approved spark arresters when required. Where vents or flues are used, all portions of the tent, ~~canopy~~ or membrane structure shall be not less than 12 inches (305 mm) from the flue or vent.

2404.15.3 Location. (No change to current text)

2404.15.4 Operations. (No change to current text)

2404.15.5 Cooking tents. Tents where cooking is performed shall be separated from other tents, ~~canopies~~ or membrane structures by a minimum of 20 feet (6096 mm).

2404.15.6 Outdoor cooking. Outdoor cooking that produces sparks or grease-laden vapors shall not be performed within 20 feet (6096 mm) of a tent, ~~canopy~~ or membrane structure.

2404.15.7 Electrical heating and cooking equipment. (No change to current text)

2404.16 LP-gas. (No change to current text)

2404.16.1 General. (No change to current text)

2404.16.2 Location of containers. LP-gas containers shall be located outside. Safety release valves shall be pointed away from the tent, ~~canopy~~ or membrane structure.

2404.16.2.1 Containers 500 gallons or less. (No change to current text)

2404.16.2.2 Containers more than 500 gallons. (No change to current text)

2404.16.3 Protection and security. Portable LP-gas containers, piping, valves and fittings which are located outside and are being used to fuel equipment inside a tent, ~~canopy~~ or membrane structure shall be adequately protected to prevent tampering, damage by vehicles or other hazards and shall be located in an approved location. Portable LP-gas containers shall be securely fastened in place to prevent unauthorized movement.

2404.17 Flammable and combustible liquids. (No change to current text)

2404.17.1 Use. (No change to current text)

2404.17.2 Flammable and combustible liquid storage. Flammable and combustible liquids shall be stored outside in an approved manner not less than 50 feet (15 240 mm) from tents, ~~canopies~~ or membrane structures. Storage shall be in accordance with Chapter 34.

2404.17.3 Refueling. Refueling shall be performed in an approved location not less than 20 feet (6096 mm) from tents, ~~canopies~~ or membrane structures.

2404.18 Display of motor vehicles. Liquid- and gas-fueled vehicles and equipment used for display within tents, ~~canopies~~ or membrane structures shall be in accordance with Sections 2404.18.1 through 2404.18.5.3.

2404.18.1 Batteries. (No change to current text)

2404.18.2 Fuel systems. Vehicles or equipment shall not be fueled or defueled within the tent, ~~canopy~~ or membrane structure.

2404.18.2.1 Quantity limit. (No change to current text)

2404.18.2.2 Inspection. (No change to current text)

2404.18.2.3 Closure. (No change to current text)

2404.18.3 Location. (No change to current text)

2404.18.4 Places of assembly. (No change to current text)

2404.18.5 Competitions and demonstrations. Liquid and gas-fueled vehicles and equipment used for competition or demonstration within a tent, ~~canopy~~ or membrane structure shall comply with Sections 2404.18.5.1 through 2404.18.5.3.

2404.18.5.1 Fuel storage. (No change to current text)

2404.18.5.2 Fueling. (No change to current text)

2404.18.5.3 Spills. (No change to current text)

2404.19 Separation of generators. Generators and other internal combustion power sources shall be separated from tents, ~~canopies~~ or membrane structures by a minimum of 20 feet (6096 mm) and shall be isolated from contact with the public by fencing, enclosure or other approved means.

2404.20 Standby personnel. When, in the opinion of the fire code official, it is essential for public safety in a tent, ~~canopy~~ or membrane structure used as a place of assembly or any other use where people congregate, because of the number of persons, or the nature of the performance, exhibition, display, contest or activity, the owner, agent or lessee shall employ one or more qualified persons, as required and approved, to remain on duty during the times such places are open to the public, or when such activity is being conducted.

Before each performance or the start of such activity, standby personnel shall keep diligent watch for fires during the time such place is open to the public or such activity is being conducted and take prompt measures for extinguishment of fires that occur and assist in the evacuation of the public from the structure.

There shall be trained crowd managers or crowd manager supervisors at a ratio of one crowd manager/supervisor for every 250 occupants, as approved.

2404.21 (Supp) Combustible vegetation. Combustible vegetation that could create a fire hazard shall be removed from the area occupied by a tent, ~~canopy~~ or membrane structure, and from areas within 30 feet (9144 mm) of such structures.

2404.22 (Supp) Combustible waste material. The floor surface inside tents, ~~canopies~~ or membrane structures and the grounds outside and within a 30 foot (9144 mm) perimeter shall be kept clear of combustible waste and other combustible materials that could create a fire hazard. Such waste shall be stored in approved containers and shall be removed from the premises at least once a day during the period the structure is occupied by the public.

2. Revise as follows:

105.6.43 Temporary membrane structures, and tents ~~and canopies~~. An operational permit is required to operate an air-supported temporary membrane structure or a tent having an area in excess of ~~200~~ 400 square feet (~~49~~ 37 m²), ~~or a canopy in excess of 400 square feet (37 m²).~~

Exceptions:

1. Tents used exclusively for recreational camping purposes.
2. ~~Fabric canopies~~ Tents open on all sides which comply with all of the following:
 - 2.1. Individual ~~canopies~~ tents having a maximum size of 700 square feet (65 m²).
 - 2.2. The aggregate area of multiple ~~canopies~~ tents placed side by side without a fire break clearance of not less than 12 feet (3658 mm) shall not exceed 700 square feet (65 m²) total.
 - 2.3. A minimum clearance of 12 feet (3658 mm) to structures and other tents shall be provided.

105.7.13 Temporary membrane structures, and tents ~~and canopies~~. A construction permit is required to erect an air-supported temporary membrane structure or a tent having an area in excess of ~~200~~ 400 square feet (~~49~~ 37 m²), ~~or a canopy in excess of 400 square feet (37 m²).~~

Exceptions:

1. Tents used exclusively for recreational camping purposes.
2. Funeral tents and curtains or extensions attached thereto, when used for funeral services.
3. ~~Fabric canopies~~ Tents and awnings open on all sides which comply with all of the following:
 - 3.1. Individual ~~canopies~~ tents shall have a maximum size of 700 square feet (65 m²).
 - 3.2. The aggregate area of multiple ~~canopies~~ tents placed side by side without a fire break clearance of not less than 12 feet (3658 mm) shall not exceed 700 square feet (65 m²) total.
 - 3.3. A minimum clearance of 12 feet (3658 mm) to structures and other tents shall be maintained.

SECTION 202 GENERAL DEFINITIONS

CANOPY. ~~See Section 2402.1. A structure or architectural projection of rigid construction over which a covering is attached that provides weather protection, identity or decoration, and may be structurally independent or supported by attachment to a building on one end and by not less than one stanchion on the outer end.~~

**TABLE 906.1 [IBC [F] TABLE 906.1 (Supp)]
ADDITIONAL REQUIRED PORTABLE FIRE EXTINGUISHERS**

SECTION	SUBJECT
2404.12	Tents, canopies and membrane structures

(Portions of table not shown remain unchanged)

PART II – IBC GENERAL

Revise definitions as follows:

SECTION 202
DEFINITIONS

CANOPY. ~~An~~ A permanent structure or architectural projection of rigid construction over which a covering is attached that provides weather protection, identity or decoration, and shall be structurally independent or ~~and is~~ supported by the attachment to a building to which it is attached and at the outer on one end and by not less than one stanchion on the outer end. A canopy is comprised of a rigid structure over which a covering is attached.

TENT (Supp). A structure, enclosure or shelter, with or without sidewalls or drops, constructed of fabric or pliable material supported in any manner except by air or the contents it protects.

Reason: General:

The pivot point of this proposed code change affecting tents and canopies is the major difference in the way “tents” and “canopies” are defined between the building and fire codes. If it’s agreed the difference is significant and that the two codes need to be correlated, then the majority of changes needed are to be made to the fire code.

With some minor differences in the respective wording, a tent is a tent in either code. But that’s not the case with canopies.

To date, the building code definition of a canopy has been broad and general enough to encompass most everything thought of in the vernacular, be it a covered walkway or the structure that stands over fuel dispensing islands.

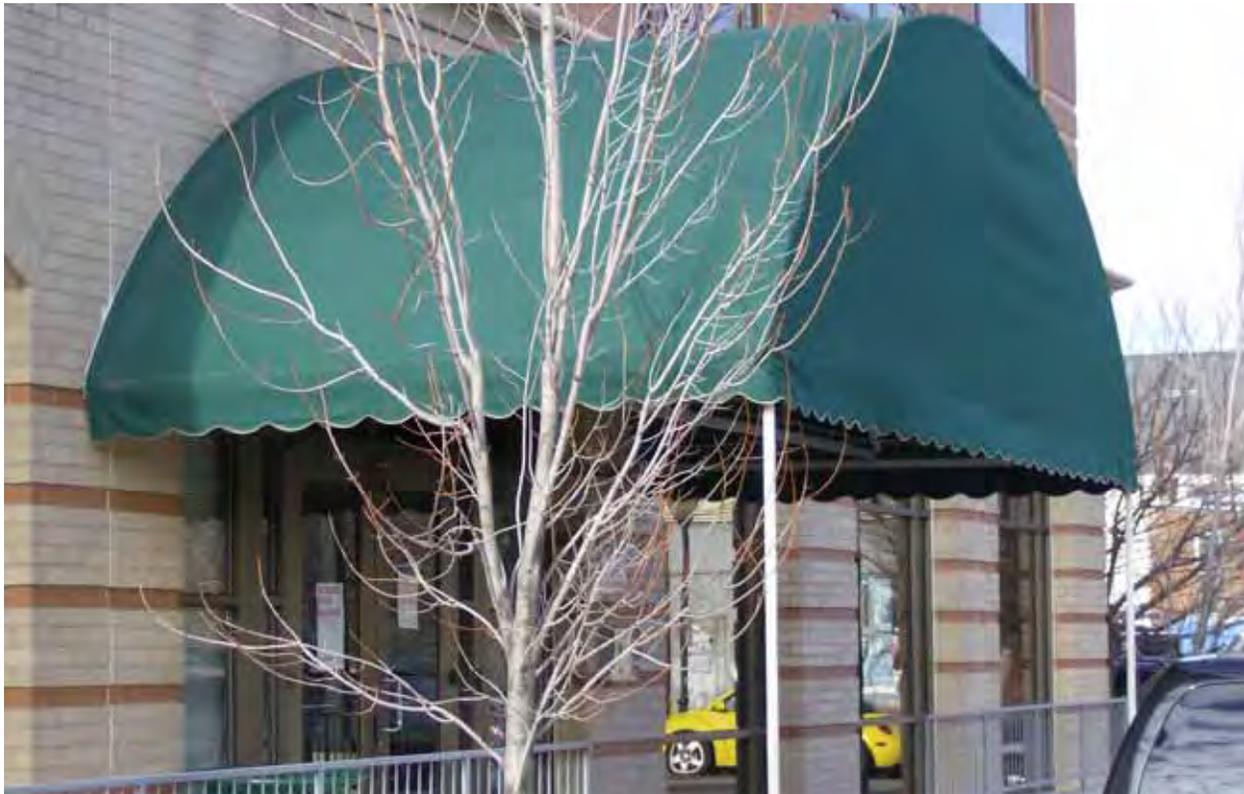
Using the current fire code verbiage of a tent or canopy, the following fits the definition of a tent:



This photo fits the definition of a canopy, and at the same time, fits the building code definition of a tent:



In the vernacular, the following are examples of canopies in the building code:



The above photo is also addressed in the fire code as a canopy but it doesn't fit the fire code definition.

Definitions:

The proposed change to the definition of canopy in both codes is to ensure what's being described still includes everything previously thought of in the vernacular but to the exclusion of the fire code's current definition of a canopy which is essentially a tent without sidewalls. Therefore, the definition of canopy is proposed for deletion and relocation in the fire code so as to cover the multiple applications currently found in the code.

By example, while the current definition of canopy in the fire code is found in Chapter 24 Tents, Canopies and Other Membrane Structures, the context and application of a canopy is totally out sync with how canopies are addressed in Chapter 22, Motor Fuel-Dispensing Facilities and Repair Garages. Unlike the temporary nature of tents and canopies in an unchanged Chapter 24, through Chapter 22, canopies are basically independent structures with some permanence expected. In addition, the building code uses the fire code as a reference for the design and construction of canopies at fueling stations. (See IBC Sections 406.5.2, 406.5.2.1 and 2606.10.) By redefining canopies as proposed and locating the revised definition in IFC Chapter 2, it will apply to all sections of the code where canopies are addressed.

Through this proposal, there is no attempt to change the current numerical values found in the code as they relate to exit discharge capacity, the number of exits, occupancy load, etc. What is desired is to change the definitions in both codes to ensure both codes comport with each other.

CODE CHANGES RESOURCE COLLECTION – INTERNATIONAL BUILDING CODE

Code side-by-side comparison:

Attached is a comparison of the building and fire code to help illustrate the need to revise and correlate the definitions of tents and canopies, and how the technical applications of the codes get applied.

IBC Definition	IFC Definition	Permit Thresholds		Proposed change to IBC and IFC	Webster's 3 rd New International Dictionary (as referenced in IFC Section 201.4)
		IBC	IFC		
AWNING. An architectural projection that provides weather protection, identity or decoration and is wholly supported by the building to which it is attached. An awning is comprised of a lightweight, rigid skeleton structure over which a covering is attached.	Silent. Not defined.				
CANOPY. An architectural projection that provides weather protection, identity or decoration and is supported by the building to which it is attached and at the outer end by not less than one stanchion. A canopy is comprised of a rigid structure over which a covering is attached.	CANOPY. A structure, enclosure or shelter constructed of fabric or pliable materials supported by any manner, except by air or the contents it protects, and is open without sidewalls or drops on 75 percent or more of the perimeter.	>0 sq. ft.	>400 sq. ft.	Canopy. A structure or architectural projection of rigid construction over which a covering is attached that provides weather protection, identity or decoration, and may be structurally independent or supported by attachment to a building on one end by not less than one stanchion on the outer end.	Canopy. 1: a covering usu. For shelter or protection a: a covering usu. of cloth suspended from the four high posts of a bed d: a temporary or permanent cover providing shelter and decoration (as over a door or window) f: an awning or marquee often stretching from doorway to curb or covering a section of grandstand.
TENT. Any structure, enclosure or shelter which is constructed of canvas or pliable material supported in any manner except by air or the contents it protects.	TENT. A structure, enclosure or shelter constructed of fabric or pliable material supported by any manner except by air or the contents that it protects.	>120 sq. ft. (Sec. 3103.1.1)	>200 sq. ft. Exception: Aggregate (w/ less than 12 ft. fire break) or individual fabric canopies = or <700 sq. ft.	TENT. A structure, enclosure or shelter, with or without sidewalls or drops, constructed of fabric or pliable material supported by any manner except by air or the contents that it protects.	Tent. 1: a collapsible shelter of canvas or other material stretched and sustained by poles, usu. made fast by ropes attached to pegs hammered into the ground, and used for camping outdoors (as by soldiers or vacationers) or as a temporary building (as for theatrical performance) 3: something that resembles a tent or that serves as a shelter

LIST OF CODE SECTIONS AND TOPICS ADDRESSING TENTS OR CANOPIES									
IBC Chapter and Subject	IBC				IFC Chapter and Subject	IFC			
	Canopy		Tents			Canopy		Tents	
1 Administration					1 Administration	105.6.43	Operational permit threshold	105.6.43	Operational permit threshold
						105.7.13	Construction permit threshold	105.7.13	Construction permit threshold
2 Definitions	202	Definition of canopy	202	Definition of tent	2 Definitions				
3 Use and Occupancy Classification					3 General precautions against fire	315.3.1	Storage prohibitions under unsprinklered "eaves, canopies or other projections or overhangs".		
4 Special detailed requirements based on use and occupancy	406.5.2	Motor fuel dispensing facilities							
	406.5.2.1	Motor fuel dispensing facilities for hydrogen							
					6 Building services and systems			604.2.9	Emergency power for exit signs in temporary tents
7 Fire-resistance rated construction	705.5.2	Fire walls to extend to outer edge of canopies							
					9 Fire protections systems	T903.2.13	Cross ref for add req fire ext for Hydrogen fueling area canopies		
						T906.1	Additional required fire extinguishers	T906.1	Additional required fire extinguishers
10 Means of egress	1025.6.2.2	Smoke protected seating; roof height			10 Means of egress	1025.6.2.2	Smoke protected seating; roof height		
16 Structural design	T1607.1 (30)	Uniform and concentrated live loads from canopies							
	1607.11.2.4	Ref to T1607.1, Sec 1608 & 1609 for uniform live loads of canopies							
					22 Motor fuel-dispensing and repair garages	2202.1	Motor fuel-dispensing facilities; definition of "dispensing device, overhead type" under canopies		
						2203.1(2) Exce	Location of fuel dispensing devices		
						2207.4 Excep	LP dispensing		

LIST OF CODE SECTIONS AND TOPICS ADDRESSING TENTS OR CANOPIES

IBC Chapter and Subject	IBC		IFC Chapter and Subject	IFC	
	Canopy	Tents		Canopy	Tents
				exceptions	exceptions
				2403.8.4	Connecting corridors between tents
			2403.8.5	Required fire break around canopies	Required fire break around tents
			2403.9	Adequate anchorage requirement	Adequate anchorage requirement
			2403.11	Seating in canopies to comply w/ Chap 10	Seating in tents to comply w/ Chap 10
			2403.12	Means of egress	Means of egress
			2403.12.1	Means of egress distribution	Means of egress distribution
			2403.12.2 & T 2403.12.2	Number of means of egress	Number of means of egress
			2404.1	Temp canopies to comply w/ IFC Permanent canopies to also comply w/ IBC	Temp tents to comply w/ IFC. Permanent tents to also comply w/ IBC
			2404.2	Canopy material to comply w/ 701	Tent material to comply w/ 701
			2404.3	Canopy material label requirement	Tent material label requirement
			2404.4	Certification requirement about fabric treatment	Certification requirement about fabric treatment
			2404.5	Proximity of combustible materials	Proximity of combustible materials
			2404.6	Smoking prohibition	Smoking prohibition
			2404.7	Proximity of open flames	Proximity of open flames
			2404.8	No fireworks w/in 100 feet of canopy	No fireworks w/in 100 feet of tent
			2404.10	Restriction against showing movies under canopies unless using safety film	Restriction against showing movies under tents unless using safety film
			2404.15.2	Venting of heating & cooking equip.	Venting of heating & cooking equip.
			2404.15.5	Canopy separation from cooking tents	Cooking tent separation from other tents
			2404.15.6	Proximity of outdoor cooking (grease & sparks)	Proximity of outdoor cooking (grease & sparks)
			2404.16.2	Location of	Location of

CODE CHANGES RESOURCE COLLECTION – INTERNATIONAL BUILDING CODE

LIST OF CODE SECTIONS AND TOPICS ADDRESSING TENTS OR CANOPIES								
IBC Chapter and Subject	IBC				IFC Chapter and Subject	IFC		
	Canopy		Tents			Canopy		Tents
						LP-gas containers		LP-gas containers
					2404.16.3	LP-gas container security	2404.16.3	LP-gas container security
					2404.17.1	Prohibition against using flammable liquid fueled equipment in canopies	2404.17.1	Prohibition against using flammable liquid fueled equipment in tents
					2404.17.2	Separation requirement between canopy and flammable liquid storage	2404.17.2	Separation requirement between tent and flammable liquid storage
					2404.18	Display of motor vehicles	2404.18	Display of motor vehicles
					2404.18.2	Prohibition of fueling vehicles in canopies	2404.18.2	Prohibition of fueling vehicles in tents
					2404.18.5	Fuel-fired vehicle competitions & demo under canopy	2404.18.5	Fuel-fired vehicle competitions & demo under tent
					2404.19	Separation of generators from canopies	2404.19	Separation of generators from tent
					2404.20	Standby personnel; fire watch	2404.20	Standby personnel; fire watch
					2404.21	Vegetation removal	2404.21	Vegetation removal
					2404.22	Required removal or clearance of waste material from canopies	2404.22	Required removal or clearance of waste material from tent
26 Plastic	2606.10	Criteria for light-transmitting plastics used in canopies at motor fuel-dispensing facilities						
			2702.2.9	Emergency power for exit signs				
31 Special construction	3101.1	Scoping for canopies						
			3103.1	Temp tents (<180 days) to comply w/ IFC. Permanent tents to comply w/ IBC provisions.				
			3103.4	Temporary structures to comply with Chap 10				
	3105.1	General						

LIST OF CODE SECTIONS AND TOPICS ADDRESSING TENTS OR CANOPIES									
IBC Chapter and Subject	IBC				IFC Chapter and Subject	IFC			
	Canopy		Tents			Canopy		Tents	
			reference for canopy requirements						
	3105.3	Reference to Chap 16 for wind or lateral loads and live loads for canopies							
	3105.4	Canopy materials; flame spread							
32 Encroachments into the public right-of-way	3201.4	Limit of drainage water from canopy to encroach upon public right-of-way							
	3202.3.1	Limit of encroachment of canopy structure to public right-of-way							
33 Safeguards during construction	3306.7	Canopy height over walkway							
Appendix D Fire Districts	D102.2.8	Permanent canopies in fire districts							

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

PART I – IFC

Committee Action:

Approved as Submitted

Committee Reason: The proposal was approved because the committee felt that it provides a needed clarification and improved correlation between the tent and canopy provisions of the IBC and those of the IFC. It was observed, however, that the lack of a definition for canopy in the IFC may become problematic later on. The action is also consistent with the action of the IBC-General Committee on Part II.

Assembly Action:

None

PART II – IBC GENERAL

Committee Action:

Approved as Submitted

Committee Reason: Clarifies within the IBC the difference between a tent-like structure and permanent canopy structure such as those used in locations such as fuel service stations.

Assembly Action:

None

Final Hearing Results

**F243-07/08, Part I
F243-07/08, Part II**

**AMPC
AS**

Code Change No: F245-07/08

Original Proposal

Sections: 2701.2.2.1, 2702.1 (IBC [F] 307.2)

Proponent: Larry Fluer, Fluer, Inc., representing Compressed Gas Association

1. Revise as follows:

2701.2.2.1 Physical hazards. The material categories listed in this section are classified as physical hazards. A material with a primary classification as a physical hazard can also pose a health hazard.

1. Explosives and blasting agents.
2. Flammable and combustible liquids.
3. Flammable solids ~~and gases~~.
4. Organic peroxide materials.
5. Oxidizer materials.
6. Pyrophoric materials.
7. Unstable (reactive) materials.
8. Water-reactive solids and liquids.
9. Cryogenic fluids.
10. Compressed gases.

2. Revise definition as follows:

2702.1 (IBC [F] 307.2) Definitions. The following words and terms shall, for the purposes of this chapter, Chapters 28 through 44 and as used elsewhere in this code, have the meanings shown herein.

PHYSICAL HAZARD. A chemical for which there is evidence that it is a combustible liquid, compressed gas, cryogenic, explosive, ~~flammable gas~~, flammable liquid, flammable solid, organic peroxide, oxidizer, pyrophoric or unstable (reactive) or water-reactive material.

Reason: All compressed gases are physical hazards by definition. Those gases that are regulated as either physical or health hazards within the context of Chapter 27 are identified in Tables 2703.1.1(1) through 2703.1.1(4). Compressed gases with no listed MAQ are not regulated within Chapter 27; however, they are regulated by Chapter 30.

Deleting the term “and gases” from item 3 of Section 2701.2.2.1 and adding a general category of “compressed gases” and deleting the term “flammable gas” from the definition will correlate this section with the definition of physical hazard.

Revision of the term physical hazard has been made to delete “flammable gas” as it is redundant to the category of “compressed gas.”

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: Disapproved at the request of the proponent who wishes to revise the proposal to reflect a consensus that has been reached on how to better deal with physical and health hazards since the proposal was first submitted.

Assembly Action:

None

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because a public comment was submitted.

Public Comment:

Larry Fluer, Fluer, Inc., representing Compressed Gas Association, requests Approval as Modified by this public comment.

Modify proposal as follows:

2701.2.2.1 Physical hazards. The material categories listed in this section are classified as physical hazards. A material with a primary classification as a physical hazard can also pose a health hazard.

1. Explosives and blasting agents.
2. ~~Flammable and~~ Combustible liquids.
3. Flammable solids, liquids and gases.
4. Organic peroxide ~~materials~~ solids or liquids.
5. Oxidizer ~~materials~~ solids or liquids.
6. Oxidizing gases.
- 6- ~~7.~~ Pyrophoric ~~materials~~ solids, liquids or gases.
- 7- ~~8.~~ Unstable (reactive) materials solids, liquids or gases.
- 8- ~~9.~~ Water-reactive ~~materials~~ solids and or liquids.
- 9- ~~10.~~ Cryogenic fluids.
- 10- ~~Compressed gases~~.

2702.1 (IBC [F] 307.2) Definitions. The following words and terms shall, for the purposes of this chapter, Chapters 28 through 44 and as used elsewhere in this code, have the meanings shown herein.

PHYSICAL HAZARD. A chemical for which there is evidence that it is a combustible liquid, ~~compressed gas~~, cryogenic fluid, explosive, flammable solid, liquid or gas, ~~flammable liquid, flammable solid~~, organic peroxide solid or liquid, oxidizer solid or liquid, oxidizing gas, pyrophoric solids, liquid or gas or unstable (reactive) materials solid, liquid or gas or water-reactive materials, solid or liquid.

Commenter's Reason: The original submittal was initially triggered by the introduction of a definition for oxidizing gases and changes in terminology to clarify the differences between "oxidizer, solids and liquids" vs. oxidizing gases. During discussion with participants at the committee hearings a concern was raised with the inclusion of a general category of "compressed gas" to the list of physical hazards even though the term was used within the definition itself.

The proposed modification adds oxidizing gases to the list of items in Section 2701.2.2.1 and correlates the terminology used in the definition with that used in the list of materials. The apparent inconsistency in terminology for unstable and water reactive materials is driven by the definitions as they appear in material specific chapters 43 and 44 respectively using the term "unstable (reactive) material" to include solids, liquids and gases and the term "water-reactive material" to describe the material regulated which is limited to the solid and liquid form of materials in this category.

Approval of this modification will bring consistency between the definition of physical hazard and the list of materials regulated as physical hazards within the context of the IFC.

Final Hearing Results

F245-07/08

AMPC

Code Change No: F247-07/08

Original Proposal

Table 2703.1.1(1) [IBC [F] Table 307.1(1)], Table 2703.1.1(3)

Proponent: Larry Fluor, Fluor, Inc., representing Compressed Gas Association

Revise tables as follows:

**TABLE 2703.1.1(1) [IBC [F] 307.1(1)](Supp)
MAXIMUM ALLOWABLE QUANTITY PER CONTROL AREA OF
HAZARDOUS MATERIAL POSING A PHYSICAL HAZARD^{a,j,m,n,p}**

MATERIAL	CLASS	GROUP WHEN THE MAXIMUM ALLOWABLE QUANTITY IS EXCEEDED	STORAGE ^b			USE-CLOSED SYSTEMS ^b			USE-OPEN SYSTEMS ^b	
			Solid pounds (cubic feet)	Liquid gallons (pounds)	Gas cubic feet at NTP	Solid pounds (cubic feet)	Liquid gallons (pounds)	Gas cubic feet at NTP	Solid pounds (cubic feet)	Liquid gallons (pounds)
Inert gas	Gaseous	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Limited</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Limited</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
	Liquefied	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Limited</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Limited</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Cryogenic	Not Applicable	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Limited</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Limited</u>	<u>Not Applicable</u>	<u>Not Applicable</u>
Inert		<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Limited</u>	<u>Not Applicable</u>	<u>Not Applicable</u>	<u>Not Limited</u>	<u>Not Applicable</u>	<u>Not Applicable</u>

(Portions of table and footnotes not shown remain unchanged)

TABLE 2703.1.1(3) (Supp)
MAXIMUM ALLOWABLE QUANTITY PER CONTROL AREA OF HAZARDOUS MATERIAL
POSING A PHYSICAL HAZARD IN AN OUTDOOR CONTROL AREA^{a,b,c}

MATERIAL	CLASS	GROUP WHEN THE MAXIMUM ALLOWABLE QUANTITY IS EXCEEDED	STORAGE ^b			USE-CLOSED SYSTEMS ^b			USE-OPEN SYSTEMS ^b	
			Solid pounds (cubic feet)	Liquid gallons (pounds)	Gas cubic feet at NTP	Solid pounds (cubic feet)	Liquid gallons (pounds)	Gas cubic feet at NTP	Solid pounds (cubic feet)	Liquid gallons (pounds)
Inert gas	Gaseous	Not Applicable	Not Applicable	Not Applicable	Not Limited	Not Applicable	Not Applicable	Not Limited	Not Applicable	Not Applicable
	Liquefied	Not Applicable	Not Applicable	Not Applicable	Not Limited	Not Applicable	Not Applicable	Not Limited	Not Applicable	Not Applicable
Cryogenic Inert	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Limited	Not Applicable	Not Applicable	Not Limited	Not Applicable	Not Applicable

(Portions of table and footnotes not shown remain unchanged)

Reason: Permits are required for inert gases when exceeding the amounts indicated in Tables 105.6.8 and 105.6.10; however, occupancy is not determined based on a quantity of inert gas. With respect to the table inert gases should be treated in a manner similar to Unstable Reactive or Water Reactive Class 1 materials where the quantity is indicated as “unlimited.” This change will coordinate the MAQ tables with Section 2701.2.2.1 which lists cryogenics and the definition of physical hazard in Section 2702.1 which lists definitions and includes all “compressed gases.”

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The proposal was approved because the committee felt that the additional table entries will provide needed guidance to the fire code official in determining occupancy Group H.

Assembly Action:

None

Final Hearing Results

F247-07/08

AS

Code Change No: F254-07/08

Original Proposal

Sections: 2704.7; IBC [F] 414.5.4

Proponent: Lance H. Edwards, The National Paint & Coatings Association

Revise as follows:

2704.7 (Supp) Standby or emergency power. Where mechanical ventilation, treatment systems, temperature control, alarm, detection or other electrically operated systems are required, such systems shall be provided with an emergency or standby power system in accordance with NFPA 70 and Section 604.

Exceptions:

1. Standby or emergency power for mechanical ventilation for storage of flammable and combustible liquids in single story occupancies.
- ~~2.~~ ~~3.~~ Storage areas for Class 1 and 2 oxidizers.
- ~~3.~~ ~~4.~~ Storage areas for Class II, III, IV and V organic peroxides.
- ~~4.~~ ~~5.~~ Storage areas for asphyxiant, irritant and radioactive gases.
- ~~5.~~ ~~6.~~ For storage areas for highly toxic or toxic materials, see Sections 3704.2.2.8 and 3704.3.2.6.
- ~~6.~~ Standby power for mechanical ventilation, treatment systems and temperature control systems shall not be required where an approved fail-safe engineered system is installed.

[F] 414.5.4 (Supp) Standby or emergency power. Where mechanical ventilation, treatment systems, temperature control, alarm, detection or other electrically operated systems are required, such systems shall be provided with an emergency or standby power system in accordance with Section 2702.

Exceptions:

1. Standby or emergency power for mechanical ventilation for storage of flammable and combustible liquids in single story occupancies.
- ~~4-~~ 2. Storage areas for Class 1 and 2 oxidizers.
- ~~2-~~ 3. Storage areas for Class II, III, IV and V organic peroxides.
- ~~3-~~ 4. Storage areas for asphyxiant, irritant and radioactive gases.
- 4- 5. For storage, use and handling areas for highly toxic or toxic materials, see Sections 3704.2.2.8 and 3704.3.2.6 of the *International Fire Code*.
- ~~5-~~ 6. Standby power for mechanical ventilation, treatment systems and temperature control systems shall not be required where an approved fail-safe engineered system is installed.

Reason: This proposal will remove the requirement for standby power for flammable and combustible liquid storage ventilation. The requirement for standby power was originally not applicable to flammable and combustible liquids. NFPA 30 never required it for storage and still does not. When the Chapter 27 ventilation requirements were applied to flammable and combustible liquids storage the standby power requirement was inadvertently picked up. When enforced, it is a costly provision with very limited benefit. This proposal will coordinate the IFC and NFPA 30 requirements for standby power for flammable and combustible liquids storage ventilation. These materials are in sealed containers in storage so we do not see the need for the redundant requirement for standby power for ventilation for this condition.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Modified

Modify the proposal as follows:

2704.7 (Supp) Standby or emergency power. Where mechanical ventilation, treatment systems, temperature control, alarm, detection or other electrically operated systems are required, such systems shall be provided with an emergency or standby power system in accordance with NFPA 70 and Section 604.

Exceptions:

1. ~~Standby or emergency power for m-~~ Mechanical ventilation for storage of Class IB and Class IC flammable and combustible liquids in closed containers not exceeding 6.5 gallons (25 L) capacity single story occupancies.
2. Storage areas for Class 1 and 2 oxidizers.
3. Storage areas for Class II, III, IV and V organic peroxides.
4. Storage areas for asphyxiant, irritant and radioactive gases.
5. For storage areas for highly toxic or toxic materials, see Sections 3704.2.2.8 and 3704.3.2.6.
6. Standby power for mechanical ventilation, treatment systems and temperature control systems shall not be required where an approved fail-safe engineered system is installed.

[F] 414.5.4 (Supp) Standby or emergency power. Where mechanical ventilation, treatment systems, temperature control, alarm, detection or other electrically operated systems are required, such systems shall be provided with an emergency or standby power system in accordance with Section 2702.

Exceptions:

1. ~~Standby or emergency power for m-~~ Mechanical ventilation for storage of Class IB and Class IC flammable and combustible liquids in closed containers not exceeding 6.5 gallons (25 L) capacity single story occupancies.
2. Storage areas for Class 1 and 2 oxidizers.
3. Storage areas for Class II, III, IV and V organic peroxides.
4. Storage areas for asphyxiant, irritant and radioactive gases.
5. For storage, use and handling areas for highly toxic or toxic materials, see Sections 3704.2.2.8 and 3704.3.2.6 of the *International Fire Code*.
6. Standby power for mechanical ventilation, treatment systems and temperature control systems shall not be required where an approved fail-safe engineered system is installed.

Committee Reason: The committee agreed that the proponent's reason statement accurately and adequately substantiates the need for the change. The modification correlates with industry treatment of portable container storage. Notably, FM Global recognizes that storage of small, closed containers does not pose a risk that warrants ventilation for these materials. FM Data Sheet 7-29, *Flammable and Combustible Liquid Storage in Portable Containers*, does not require mechanical ventilation for flammable liquids in closed containers of not greater than 6.5 gallons individual capacity, with a flash point of not greater than 100 °F and a boiling point equal to or greater than 100°F. NFPA 30, *Flammable and*

Combustible Liquids Code, also recognizes that closed container storage does not pose a risk that warrants ventilation (ventilation is required if there is open dispensing). These materials are in sealed containers in storage. Any loss of power would require an immediate cessation of operations, which would eliminate spill risk. By limiting the container size, the potential for accidental spills is significantly reduced.

Assembly Action:

None

Final Hearing Results

F254-07/08

AM

Code Change No: **F291-07/08**

Original Proposal

Sections: 4002.1 (IBC 307.2)

Proponent: Patrick A. McLaughlin, McLaughlin & Associates, representing Arch Chemicals, Inc., and PPG Industries, Inc.

Revise definition as follows:

4002.1 (IBC 307.2) Definitions. The following words and terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

OXIDIZER. A material that readily yields oxygen or other oxidizing gas, or that readily reacts to promote or initiate combustion of combustible materials and, if heated or contaminated, can result in vigorous self-sustained decomposition ~~Examples of other oxidizing gases include bromine, chlorine and fluorine.~~

Class 4. An oxidizer that can undergo an explosive reaction due to contamination or exposure to thermal or physical shock and that causes a severe increase in the burning rate of combustible materials with which it comes into contact. In addition, the oxidizer ~~will enhance~~ causes a severe increase in the burning rate and can cause spontaneous ignition of combustibles.

Class 3. An oxidizer that ~~will~~ causes a severe increase in the burning rate of combustible materials with which it comes in contact ~~or that will undergo vigorous self-sustained decomposition caused by contamination or exposure to heat~~.

Class 2. An oxidizer that will cause a moderate increase in the burning rate ~~or that causes spontaneous ignition~~ of combustible materials with which it comes in contact.

Class 1. An oxidizer ~~that does not moderately increase the burning rate of whose primary hazard is that it slightly increases the burning rate but which does not cause spontaneous ignition when it comes in contact with~~ combustible materials.

Reason: This proposal updates the IFC (IBC) definition of oxidizer to be consistent with the current definition of an oxidizer. The definition of an oxidizer in the IFC (IBC) is based on the definition in the Uniform Fire Code which came from NFPA 430.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The proposal was approved because the committee felt that it provides an appropriate update to the definition oxidizer consistent with OSHA regulations and NFPA 40.

Assembly Action:

None

Final Hearing Results

F291-07/08

AS

2006 INTERNATIONAL MECHANICAL CODE

Code Change No: **M16-07/08**

Original Proposal

Table 308.6, 307.2.3, 506.3.1.1, 507.4, 507.5, [F] 513.13.1 (IFC 909.13.1; IBC [F] 902.13.1), Table 603.4, 803.8, Table 803.9(1), Table 803.9(2), 803.10.4; IRC Table M1306.2, M1308.2, M1411.3.1, M1502.5, M1505.1, Table M1601.1.1(2), Table M1803.2; IFGC 404.5, 502.4, 502.7; IBC 716.5.3, 716.5.4, 716.6.1

Proponent: Guy McMann, Jefferson County, CO, representing the Colorado Association of Plumbing and Mechanical Officials (CAPMO)

THESE PROPOSALS ARE ON THE AGENDA OF THE IMC, THE IRC MECHANICAL, THE IFGC AND THE IBC FIRE SAFETY CODE DEVELOPMENT COMMITTEES AS 4 SEPARATE CODE CHANGES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IMC

Revise as follows:

305.5 Protection against physical damage. In concealed locations where piping, other than cast-iron or steel, is installed through holes or notches in studs, joists, rafters or similar members less than 1.5 inches (38 mm) from the nearest edge of the member, the pipe shall be protected by shield plates. Protective steel shield plates ~~shall be a minimum of 0.062-inch-thick (1.6 mm)-steel~~ having a minimum thickness of 0.0575-inches (1.463 mm) (No. 16 Gage), shall cover the area of the pipe where the member is notched or bored, and shall extend a minimum of 2 inches (51 mm) above sole plates and below top plates.

307.2.3 Auxiliary and secondary drain systems. In addition to the requirements of Section 307.2.1, a secondary drain or auxiliary drain pan shall be required for each cooling or evaporator coil or fuel-fired appliance that produces condensate, where damage to any building components will occur as a result of overflow from the equipment drain pan or stoppage in the condensate drain piping. One of the following methods shall be used:

1. An auxiliary drain pan with a separate drain shall be provided under the coils on which condensation will occur. The auxiliary pan drain shall discharge to a conspicuous point of disposal to alert occupants in the event of a stoppage of the primary drain. The pan shall have a minimum depth of 1.5 inches (38 mm), shall not be less than 3 inches (76 mm) larger than the unit or the coil dimensions in width and length and shall be constructed of corrosion-resistant material. ~~Metallic Galvanized sheet steel~~ galvanized sheet metal pans shall have a minimum thickness of not less than ~~0.0276 0.0236 -inch (0.7 mm)~~ 0.0236 -inch (0.6010 mm) (No. 24 gauge) galvanized sheet metal. Nonmetallic pans shall have a minimum thickness of not less than 0.0625 inch (1.6 mm).
2. A separate overflow drain line shall be connected to the drain pan provided with the equipment. Such overflow drain shall discharge to a conspicuous point of disposal to alert occupants in the event of a stoppage of the primary drain. The overflow drain line shall connect to the drain pan at a higher level than the primary drain connection.
3. An auxiliary drain pan without a separate drain line shall be provided under the coils on which condensate will occur. Such pan shall be equipped with a water-level detection device conforming to UL 508 that will shut off the equipment served prior to overflow of the pan. The auxiliary drain pan shall be constructed in accordance with Item 1 of this section.
4. A water level detection device conforming to UL 508 shall be provided that will shut off the equipment served in the event that the primary drain is blocked. The device shall be installed in the primary drain line, the overflow drain line, or in the equipment-supplied drain pan, located at a point higher than the primary drain line connection and below the overflow rim of such pan.

Exception: Fuel-fired appliances that automatically shut down operation in the event of a stoppage in the condensate drainage system.

**TABLE 308.6
CLEARANCE REDUCTION METHODS**

TYPE OF PROTECTIVE ASSEMBLY	REDUCED CLEARANCE WITH PROTECTION (inches)							
	Horizontal combustible assemblies located above the heat source				Horizontal combustible assemblies located beneath the heat source and all vertical combustible assemblies			
	Required clearance to combustibles without protection (inches)				Required clearance to combustibles without protection (inches)			
	36	18	9	6	36	18	9	6
Galvanized sheet metal steel, having a minimum nominal thickness of 0.024 <u>0.0236</u> inches (0.6010 mm) (No. 24 Gage), mounted on 1-inch glass fiber or mineral wool batt reinforced with wire on the back, 1 inch off the combustible assembly	18	9	5	3	12	6	6	3
Galvanized sheet metal steel, having a minimum nominal thickness of 0.024 <u>0.0236</u> inch (0.6010 mm) (No. 24 Gage), spaced 1 inch off the combustible assembly	18	9	5	3	12	6	6	2
Two layers of galvanized sheet metal steel, having a minimum nominal thickness of 0.024 <u>0.036</u> inch (0.6010 mm) (No. 24 Gage), having a 1-inch airspace between layers, spaced 1 inch off the combustible assembly	18	9	5	3	12	6	6	3
Two layers of galvanized sheet metal steel, having a minimum nominal thickness of 0.024 <u>0.0236</u> inch (0.6010 mm) (No. 24 Gage), having 1 inch of fiberglass insulation between layers, spaced 1 inch off the combustible assembly	18	9	5	3	12	6	6	3
0.5-inch inorganic insulating board, over 1 inch of fiberglass or mineral wool batt, against the combustible assembly	24	12	6	4	18	9	9	3
3.5-inch brick wall, spaced 1 inch off the combustible wall	—	—	—	—	12	6	6	6
3.5-inch brick wall, against the combustible wall	—	—	—	—	24	12	12	5

(Footnotes not shown remain unchanged)

506.3.1.1 (Supp) Grease duct materials. Grease ducts serving Type I hoods shall be constructed of steel ~~not less than 0.055-inch (1.4 mm) (No. 16 Gage) in thickness~~ having a minimum thickness of 0.575-inch (1.463 mm) (No. 16 gage) or stainless steel not less than ~~0.044~~ 0.0450-inch (1.14 mm) (No. 18 Gage) in thickness.

Exception: Factory-built commercial kitchen grease ducts listed and labeled in accordance with UL 1978 and installed in accordance with Section 304.1.

507.4 Type I materials. Type I hoods shall be constructed of steel ~~not less than 0.043-inch (1.09 mm) (No. 18 MSG) in thickness,~~ having a minimum thickness of 0.0466-inches (1.181 mm) (No. 18 Gage) or stainless steel not less than ~~0.037~~ 0.0335-inch (~~0.94 mm~~) (.8525 mm) (No. 20 MSG) in thickness.

507.5 Type II hood materials. Type II hoods shall be constructed of steel ~~not less than 0.030-inch (0.76 mm) (No. 22 Gage) in thickness,~~ having a minimum thickness of 0.0296-inches (.7534 mm) (No. 22 Gage) or stainless steel not less than ~~0.024~~ 0.0220-inch (~~0.61 mm~~) (5550 mm) (No. 24 Gage) in thickness, copper sheets weighing not less than 24 ounces per square foot (7.3 kg/m²), or of other approved material and gage.

[F] 513.13.1 (IFC 902.13.1; IBC [F] 902.13.1) Materials. Control-air tubing shall be hard-drawn copper, Type L, ACR in accordance with ASTM B 42, ASTM B 43, ASTM B 68, ASTM B 88, ASTM B 251 and ASTM B 280. Fittings shall be wrought copper or brass, solder type in accordance with ASME B 16.18 or ASME B 16.22. Changes in direction shall be made with appropriate tool bends. Brass compression-type fittings shall be used at final connection to devices; other joints shall be brazed using a BCuP5 brazing alloy with solidus above 1,100°F (593°C) and liquids below 1,500°F (816°C). Brazing flux shall be used on copper-to-brass joints only.

Exception: Nonmetallic tubing used within control panels and at the final connection to devices provided all of the following conditions are met:

1. Tubing shall be listed by an approved agency for flame and smoke characteristics.
2. Tubing and connected device shall be completely enclosed within a galvanized or paint-grade steel enclosure ~~of not less than 0.030 inch (0.76 mm) (No. 22 galvanized sheet gage) thickness~~ having a minimum thickness of 0.0296-inches (.7534 mm) (No. 22 Gage) Entry to the enclosure shall be by copper tubing with a protective grommet of neoprene or teflon or by suitable brass compression to male barbed adapter.
3. Tubing shall be identified by appropriately documented coding.
4. Tubing shall be neatly tied and supported within the enclosure. Tubing bridging cabinets and doors or moveable devices shall be of sufficient length to avoid tension and excessive stress. Tubing shall be protected against abrasion. Tubing serving devices on doors shall be fastened along hinges.

**TABLE 603.4
DUCT CONSTRUCTION MINIMUM SHEET METAL
THICKNESSES FOR SINGLE DWELLING UNITS**

DUCT SIZE	GALVANIZED		APPROXIMATE ALUMINUM B & S GAGE MINIMUM THICKNESS
	MINIMUM THICKNESS INCHES AND (mm)	EQUIVALENT GALVANIZED GAGE NO.	
Round ducts and enclosed rectangular ducts 14" or less	0.043 <u>0.0157 (.3950 mm)</u>	30 <u>28</u>	26 <u>0.0175</u>
Over 14" <u>16 and 18 inch</u>	0.046 <u>0.0187 (.4712 mm)</u>	28 <u>26</u>	24 <u>0.018</u>
20 inch and over	0.0236 (.6010 mm)	24	0.023
Exposed rectangular ducts 14" or less	0.046 <u>0.0157 (0.3950 mm)</u>	28	24 <u>0.0175</u>
Over 14" ^a	0.049 <u>0.0187 (.4712 mm)</u>	26	22 <u>0.018</u>

a. For duct gages and reinforcement requirements at static pressures of 1/2", 1" and 2" w.g., SMACNA Duct Construction Standard, Tables 2-1; 2-2 and 2-3 shall apply.

803.8 Vent connector construction. Vent connectors shall be constructed of metal. The minimum ~~nominal~~ thickness of the connector shall be ~~0.049 inch (0.5 mm)~~ 0.0136-inches (.3462 mm) (No. 28 Gage) for galvanized steel, 0.022 inch (0.6 mm) (No. 26 B & S Gage) for copper, and 0.020 inch (0.5 mm) (No. 24 B & S Gage) for aluminum.

**TABLE 803.9(1)
MINIMUM CHIMNEY CONNECTOR THICKNESS FOR
LOW-HEAT APPLIANCES^a**

DIAMETER OF CONNECTOR (inches)	MINIMUM NOMINAL THICKNESS (galvanized) (inches) (mm)
5 and smaller	0.022 (No. 26 Gage)
Larger than 5 and up to 10	0.028 (No. 24 Gage)
Larger than 10 and up to 16	0.034 (No. 22 Gage)
<u>14 inches and less</u>	<u>0.0157 (.3950 mm) (.No. 28 Gage)</u>
Larger than 16 <u>16 and 18 inch^a</u>	<u>0.064 (No. 16 Gage)</u> <u>0.0187 (.4712 mm) (No. 26 Gage)</u>

For SI: 1 inch = 25.4 mm.

a. For sizes larger than 18 inches SMACNA Duct Construction Standard, Table 3-5 shall apply.

**TABLE 803.9(2)
MINIMUM CHIMNEY CONNECTOR THICKNESS FOR
MEDIUM- AND HIGH-HEAT APPLIANCES**

AREA (square inches)	EQUIVALENT ROUND DIAMETER (inches)	MINIMUM NOMINAL THICKNESS [inches (mm)]
0-154	0-14	0.060 <u>0.0575 (1.463 mm)</u> (No. 16 Gage)
155-201	15-16	0.075 <u>0.0705 (1.784 mm)</u> (No. 14 Gage)
202-254	17-18	0.105 <u>0.0994 (2.523 mm)</u> (No. 12 Gage)
Greater than 254	Greater than 18	0.135 <u>0.1292 (3.280 mm)</u> (No. 10 Gage)

For SI: 1 inch = 25.4 mm, 1 square inch = 645.16 mm².

**TABLE 803.10.4
CHIMNEY CONNECTOR SYSTEMS AND CLEARANCES
TO COMBUSTIBLE WALL MATERIALS FOR DOMESTIC HEATING APPLIANCES^{a,b,c,d}**

System A (12-inch clearance)	A 3.5-inch-thick brick wall shall be framed into the combustible wall. A 0.625-inch-thick fire-clay liner (ASTM C 315 or equivalent) shall be firmly cemented in the center of the brick wall maintaining a 12-inch clearance to combustibles. The clay liner shall run from the outer surface of the bricks to the inner surface of the chimney liner.
System B (9-inch clearance)	A labeled solid-insulated factory-built chimney section (1-inch insulation) the same inside diameter as the connector shall be utilized. Sheet metal <u>steel</u> supports cut to maintain a 9-inch clearance to combustibles shall be fastened to the wall surface and to the chimney section. Fasteners shall not penetrate the chimney flue liner. The chimney length shall be flush with the masonry chimney liner and sealed to the masonry with water-insoluble refractory cement. Chimney manufacturers' parts shall be utilized to securely fasten the chimney connector to the chimney section.
System C (6-inch clearance)	A sheet metal steel (minimum number 24 Gage) ventilated thimble <u>having a minimum thickness of 0.0236-inches (.6010 mm) (No.24 Gage)</u> having two 1-inch air channels shall be installed with a sheet steel chimney connector. (minimum number 24 Gage). <u>Sheet Steel</u> supports (minimum number 24 Gage) shall be cut to maintain a 6-inch clearance between the thimble and combustibles. <u>The chimney connector and steel supports shall have a minimum thickness of 0.0236-inches (.6010 mm) (No 24 Gage)</u> . One side of the support shall be fastened to the wall on all sides. Glass-fiber insulation shall fill the 6-inch space between the thimble and the supports.
System D (2- inch clearance)	A labeled solid-insulated factory-built chimney section (1-inch insulation) with a diameter 2 inches larger than the chimney connector shall be installed with a sheet steel chimney connector (minimum number 24 Gage) <u>having a minimum thickness of 0.0236-inches (.6010 mm) (No.24 Gage)</u> . Sheet metal <u>steel</u> supports shall be positioned to maintain a 2-inch clearance to combustibles and to hold the chimney connector to ensure that a 1-inch airspace surrounds the chimney connector through the chimney section. The steel support shall be fastened to the wall on all sides and the chimney section shall be fastened to the supports. Fasteners shall not penetrate the liner of the chimney section.

(Footnotes not shown remain unchanged)

PART II – IRC-M

1. Revise as follows:

TABLE M1306.2

a, b, c, d, e, f, g, h, i, j, k

REDUCTION OF CLEARANCES WITH SPECIFIED FORMS OF PROTECTION

TYPE OF PROTECTION APPLIED TO AND COVERING ALL SURFACES OF COMBUSTIBLE MATERIAL WITHIN THE DISTANCE SPECIFIED AS THE REQUIRED CLEARANCE WITH NO PROTECTION [See Figures M1306.1 and M1306.2]	WHERE THE REQUIRED CLEARANCE WITH NO PROTECTION FROM APPLIANCE, VENT CONNECTOR, OR SINGLE WALL METAL PIPE IS:									
	36 inches	18 inches	12 inches	9 inches	6 inches					
	Allowable clearances with specified protection (Inches) ^b									
	Use column 1 for clearances above an appliance or horizontal connector. Use column 2 for clearances from an appliance, vertical connector and single-wall metal pipe.									
	Above column 1	Sides and rear Column 2	Above column 1	Sides and rear Column 2	Above column 1	Sides and rear Column 2	Above column 1	Sides and rear Column 2	Above column 1	Sides and rear Column 2
3½-inch thick masonry wall without ventilated air space	-----	24	-----	12	-----	9	-----	6	-----	5
½-in. insulation board over 1-inch glass fiber or mineral wool batts	24	18	12	9	9	6	6	5	4	3
24 gage sheet metal Galvanized sheet steel having a minimum thickness of 0.0236-inches (.6010 mm) (No. 24 Gage) over 1-inch glass fiber or mineral wool batts reinforced with wire on rear face with a ventilated air space	18	12	9	6	6	4	5	3	3	3
3½-inch thick masonry wall with ventilated air space	-----	12	-----	6	-----	6	-----	6	-----	6
24 gage sheet metal Galvanized sheet steel having a minimum thickness of 0.0236-inches (.6010 mm) (No. 24 Gage) with a ventilated air space 1-inch off the combustible assembly	18	12	9	6	6	4	5	3	3	2
½-inch thick insulation board with ventilated air space	18	12	9	6	6	4	5	3	3	3
24 gage sheet metal Galvanized sheet steel having a minimum thickness of 0.0236-inches (.6010 mm) (No 24 Gage) with ventilated air space over 24 gage sheet metal steel with a ventilated air space	18	12	9	6	6	4	5	3	3	3

TYPE OF PROTECTION APPLIED TO AND COVERING ALL SURFACES OF COMBUSTIBLE MATERIAL WITHIN THE DISTANCE SPECIFIED AS THE REQUIRED CLEARANCE WITH NO PROTECTION [See Figures M1306.1 and M1306.2]	WHERE THE REQUIRED CLEARANCE WITH NO PROTECTION FROM APPLIANCE, VENT CONNECTOR, OR SINGLE WALL METAL PIPE IS:									
	36 inches	18 inches	12 inches	9 inches	6 inches					
	Allowable clearances with specified protection (Inches) ^b									
	Use column 1 for clearances above an appliance or horizontal connector. Use column 2 for clearances from an appliance, vertical connector and single-wall metal pipe.									
	Above column 1	Sides and rear Column 2	Above column 1	Sides and rear Column 2	Above column 1	Sides and rear Column 2	Above column 1	Sides and rear Column 2	Above column 1	Sides and rear Column 2
1-inch glass fiber or mineral wool batts sandwiched between two sheets-24 gage sheet metal of galvanized sheet steel having a minimum thickness of 0.0236-inches (.6010 mm) (No.24 Gage) with a ventilated air space.	18	12	9	6	6	4	5	3	3	3

(Footnotes not shown remain unchanged)

M1308.2 Protection against physical damage. In concealed locations where piping, other than cast-iron or galvanized steel, is installed through holes or notches in studs, joists, rafters or similar members less than 1.5 inches (38 mm) from the nearest edge of the member, the pipe shall be protected by shield plates. Protective steel shield plates shall be a minimum of 0.062-inch-thick (1.6 mm) steel having a minimum thickness of 0.0575-inches (1.463 mm) (No. 16 Gage), shall cover the area of the pipe where the member is notched or bored, and shall extend a minimum of 2 inches (51 mm) above sole plates and below top plates.

M1411.3.1 (Supp) Auxiliary and secondary drain systems. In addition to the requirements of Section M1411.3, a secondary drain or auxiliary drain pan shall be required for each cooling or evaporator coil where damage to any building components will occur as a result of overflow from the equipment drain pan or stoppage in the condensate drain piping. Such piping shall maintain a minimum horizontal slope in the direction of discharge of not less than 1/8 unit vertical in 12 units horizontal (1-percent slope). Drain piping shall be a minimum of 3/4-inch (19 mm) nominal pipe size. One of the following methods shall be used:

1. An auxiliary drain pan with a separate drain shall be installed under the coils on which condensation will occur. The auxiliary pan drain shall discharge to a conspicuous point of disposal to alert occupants in the event of a stoppage of the primary drain. The pan shall have a minimum depth of 1.5 inches (38 mm), shall not be less than 3 inches (76 mm) larger than the unit or the coil dimensions in width and length and shall be constructed of corrosion-resistant material. Metallic Galvanized sheet steel pans shall have a minimum thickness of not less than ~~0.0276-inch~~ 0.0236-inches (0.7 mm) (.6010 mm) (No. 24 Gage) galvanized sheet metal. Nonmetallic pans shall have a minimum thickness of not less than 0.0625 inch (1.6 mm).
2. A separate overflow drain line shall be connected to the drain pan provided with the equipment. This overflow drain shall discharge to a conspicuous point of disposal to alert occupants in the event of a stoppage of the primary drain. The overflow drain line shall connect to the drain pan at a higher level than the primary drain connection.
3. An auxiliary drain pan without a separate drain line shall be installed under the coils on which condensate will occur. This pan shall be equipped with a water level detection device conforming to UL 508 that will shut off the equipment served prior to overflow of the pan. The pan shall be equipped with a fitting to allow for drainage. The auxiliary drain pan shall be constructed in accordance with Item 1 of this section.

4. A water level detection device conforming to UL 508 shall be provided that will shut off the equipment served in the event that the primary drain is blocked. The device shall be installed in the primary drain line, the overflow drain line or the equipment-supplied drain pan, located at a point higher than the primary drain line connection and below the overflow rim of such pan.

M1502.5 Duct construction. Exhaust ducts shall be constructed of rigid metal, having a minimum thickness of 0.016-inch thick (0.4 mm) rigid metal ducts, 0.0157-inches (.3950 mm) (No. 28 Gage) having and shall have smooth interior surfaces with joints running in the direction of air flow. Exhaust ducts shall not be connected with sheet-metal screws or fastening means which extend into the duct.

M1505.1 General. Domestic open-top broiler units shall be provided with a metal exhaust hood, ~~not less than 28 gage,~~ having a minimum thickness of 0.0157-inches (.3950 mm (No. 28 Gage) with 1/4 inch (6 mm) clearance between the hood and the underside of combustible material or cabinets. A clearance of at least 24 inches (610 mm) shall be maintained between the cooking surface and the combustible material or cabinet. The hood shall be at least as wide as the broiler unit and shall extend over the entire unit. Such exhaust hood shall discharge to the outdoors and shall be equipped with a backdraft damper or other means to control infiltration/exfiltration when not in operation. Broiler units incorporating an integral exhaust system, and listed and labeled for use without an exhaust hood, need not be provided with an exhaust hood.

2. Delete and substitute as follows:

**TABLE M1601.1.1(2)
GAGES OF METAL DUCTS AND PLENUMS USED FOR HEATING OR COOLING**

TYPE OF DUCT	SIZE (inches)	MINIMUM THICKNESS (inch)	EQUIVALENT GALVANIZED SHEET GAGE	APPROXIMATE ALUMINUM B & S GAGE
Round ducts and enclosed rectangular ducts	14 or less over 14	0.013	30	26
		0.016	28	24
Exposed rectangular ducts	14 or less over 14	0.016	28	24
		0.019	26	22

**TABLE M1601.1.1(2)
GAGES OF METAL DUCTS AND PLENUMS USED FOR HEATING OR COOLING**

DUCT SIZE	Galvanized		Aluminum
	Minimum thickness inches and (mm)	Equivalent galvanized gage no.	Minimum thickness
Round ducts and enclosed rectangular ducts 14" or less 16 and 18 inch 20 inch and over	0.0157 (.3950 mm)	28	0.0175
	0.0187 (.4712 mm)	26	0.018
	0.0236 (.6010 mm)	24	0.023
Exposed rectangular ducts 14" or less Over 14" ^a	0.0157 (.3950 mm)	28	0.0175
	0.0187 (.4712 mm)	26	0.018

For SI: 1 inch = 25.4 mm.

- a. For duct gages and reinforcement requirements at static pressures of 1/2", 1" and 2" w.g., SMACNA Duct Construction Standard, Tables 2-1; 2-2 and 2-3 shall apply.

3. Revise table as follows:

**TABLE M1803.2
THICKNESS FOR SINGLE-WALL METAL PIPE CONNECTORS^a**

DIAMETER OF CONNECTOR (inches)	GALVANIZED SHEET METAL GAGE NUMBER	MINIMUM THICKNESS (inch) (mm)
Less than 6	26	0.019
6 to 10 14 inches and less	24 28	0.024 0.0157 (.3950 mm)
Over 10 through 16 16 and 18 inch ^a	22 26	0.029 0.0187 (.4712 mm)

For SI: 1 inch = 25.4 mm.

a. For sizes larger than 18 inches SMACNA Duct Construction Standard, Table 3-5 shall apply.

PART III – IFGC

Revise as follows:

404.5 Protection against physical damage. In concealed locations, where piping other than black or galvanized steel is installed through holes or notches in wood studs, joists, rafters or similar members less than 1.5 inches (38 mm) from the nearest edge of the member, the pipe shall be protected by shield plates. ~~Protective steel shield plates shall be a minimum of 1/16-inch-thick (1.6 mm) steel, having a minimum thickness of 0.0575-inches (1.463 mm) (No. 16 Gage)~~ shall cover the area of the pipe where the member is notched or bored and shall extend a minimum of 4 inches (102 mm) above sole plates, below top plates and to each side of a stud, joist or rafter.

502.4 Insulation shield. Where vents pass through insulated assemblies, an insulation shield constructed of steel not less than 26-gage sheet (0.016-inch) (0.4 mm) metal having a minimum thickness of 0.0187-inches (.4712 mm) (No. 26 Gage) shall be installed to provide clearance between the vent and the insulation material. The clearance shall not be less than the clearance to combustibles specified by the vent manufacturer's installation instructions. Where vents pass through attic space, the shield shall terminate not less than 2 inches (51 mm) above the insulation materials and shall be secured in place to prevent displacement. Insulation shields provided as part of a listed vent system shall be installed in accordance with the manufacturer's installation instructions.

502.7 Protection against physical damage. In concealed locations, where a vent is installed through holes or notches in studs, joists, rafters or similar members less than 1.5 inches (38 mm) from the nearest edge of the member, the vent shall be protected by shield plates. Protective steel shield plates shall be a minimum of 1/16-inch-thick (1.6 mm) steel, having a minimum thickness of 0.0575-inches (1.463 mm) (No. 16 Gage) shall cover the area of the vent where the member is notched or bored and shall extend a minimum of 4 inches (102 mm) above sole plates, below top plates and to each side of a stud, joist or rafter.

PART IV – IBC FIRE SAFETY

716.5.3 (Supp) Shaft enclosures. Shaft enclosures that are permitted to be penetrated by ducts and air transfer openings shall be protected with approved fire and smoke dampers installed in accordance with their listing.

Exceptions:

1. Fire dampers are not required at penetrations of shafts where:
 - 1.1. Steel exhaust subducts are extended at least 22 inches (559 mm) vertically in exhaust shafts, provided there is a continuous airflow upward to the outside; or
 - 1.2. Penetrations are tested in accordance with ASTM E119 or UL263 as part of the fire-resistance rated assembly; or
 - 1.3. Ducts are used as part of an approved smoke control system designed and installed in accordance with Section 909 and where the fire damper will interfere with the operation of the smoke control system; or
 - 1.4. The penetrations are in parking garage exhaust or supply shafts that are separated from other building shafts by not less than 2-hour fire-resistance-rated construction.
2. In Group B and R occupancies, equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1, smoke dampers are not required at penetrations of shafts where:

- 2.1. Kitchen, clothes dryer, bathroom and toilet room exhaust openings are installed with steel exhaust subducts, having a ~~wall thickness of at least 0.019 inch (0.48 mm); and~~ minimum thickness of - .0187-inches (0.4712 mm) (No. 26 Gage)
- 2.2. That extend at least 22 inches (559 mm) vertically; and
- 2.3. An exhaust fan is installed at the upper terminus of the shaft that is, powered continuously in accordance with the provisions of Section 909.11, so as to maintain a continuous upward airflow to the outside.
3. Smoke dampers are not required at penetration of exhaust or supply shafts in parking garages that are separated from other building shafts by not less than 2-hour fire-resistance-rated construction.
4. Smoke dampers are not required at penetrations of shafts where ducts are used as part of an approved mechanical smoke control system designed in accordance with Section 909 and where the smoke damper will interfere with the operation of the smoke control system.
5. Fire dampers and combination fire/smoke dampers are not required in kitchen and clothes dryer exhaust system when installed in accordance with the *International Mechanical Code*.

716.5.4 (Supp) Fire partitions. Ducts and air transfer openings that penetrate fire partitions shall be protected with listed fire dampers installed in accordance with their listing.

Exceptions: In occupancies other than Group H, fire dampers are not required where any of the following apply:

1. The partitions are tenant separation or corridor walls in buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2 and the duct is protected as a through penetration in accordance with Section 712.
2. Tenant partitions in covered mall buildings where the walls are not required by provisions elsewhere in the code to extend to the underside of the floor or roof sheathing, slab or deck above.
3. The duct system is constructed of approved materials in accordance with the *International Mechanical Code* and the duct penetrating the wall complies with all of the following requirements:
 - 3.1. The duct shall not exceed 100 square inches (0.06 m²).
 - 3.2. The duct shall be constructed of steel ~~a minimum of 0.0217 inch (0.55 mm) in thickness~~ having a minimum thickness of 0.0157-inches (0.3950 mm) (No. 28 Gage).
 - 3.3. The duct shall not have openings that communicate the corridor with adjacent spaces or rooms.
 - 3.4. The duct shall be installed above a ceiling.
 - 3.5. The duct shall not terminate at a wall register in the fire-resistance-rated wall.
 - 3.6. A minimum 12-inch-long (305 mm) ~~by 0.060-inch thick (1.52 mm)~~ steel sleeve having a minimum thickness of 0.0575-inches (1.465 mm) (No. 16 Gage) shall be centered in each duct opening. The sleeve shall be secured to both sides of the wall and all four sides of the sleeve with minimum 11/2-inch by 11/2-inch by 0.060-inch (38 mm by 38 mm by 1.52 mm) steel retaining angles. The retaining angles shall be secured to the sleeve and the wall with No. 10 (M5) screws. The annular space between the steel sleeve and the wall opening shall be filled with mineral wool batting on all sides.

716.6.1(Supp) Through penetrations. In occupancies other than Groups I-2 and I-3, a duct constructed of approved materials in accordance with the *International Mechanical Code* that penetrates a fire-resistance-rated floor/ceiling assembly that connects not more than two stories is permitted without shaft enclosure protection, provided a listed fire damper is installed at the floor line or the duct is protected in accordance with Section 712.4. For air transfer openings, see Exception 7 to Section 707.2.

Exception: A duct is permitted to penetrate three floors or less without a fire damper at each floor, provided it meets all of the following requirements:

1. The duct shall be contained and located within the cavity of a wall and shall be constructed of steel ~~not less than 0.019 inch (0.48 mm) (26 gage) in thickness~~ having a minimum thickness of 0.0187-inches ((0.4712 mm) (No. 26 Gage).
2. The duct shall open into only one dwelling or sleeping unit and the duct system shall be continuous from the unit to the exterior of the building.
3. The duct shall not exceed 4-inch (102 mm) nominal diameter and the total area of such ducts shall not exceed 100 square inches (0.065 m²) in any 100 square feet (9.3 m²) of floor area.
4. The annular space around the duct is protected with materials that prevent the passage of flame and hot gases sufficient to ignite cotton waste where subjected to ASTM E 119 or UL 263 time-temperature conditions under a minimum positive pressure differential of 0.01 inch (2.49 Pa) of water at the location of the penetration for the time period equivalent to the fire-resistance rating of the construction penetrated.
5. Grille openings located in a ceiling of a fire-resistance- rated floor/ceiling or roof/ceiling assembly shall be protected with a listed ceiling radiation damper installed in accordance with Section 716.6.2.1.

CODE CHANGES RESOURCE COLLECTION – INTERNATIONAL BUILDING CODE

Reason: The code has been inconsistent in its approach to decimals and the related gages. This is a much needed clean up in an attempt to bring consistency in language as it relates to stated decimals and gages. The gage should always accompany a decimal as most end users relate to a gage as opposed to a decimal. Some decimals were not accurate to the stated gage. Also, some of the gages stated in the tables were not consistent with the standard and were changed to reflect that. Now anyone can reference the SMACNA standard and go to Table A-2; A-4 and 3-5 and see where the numbers come from. A new footnote has been added to Tables 603.4, 803.9 (1) and 503.10.2.4 to direct the user to more information that doesn't necessarily need to be in the code. There are many combinations of gages and reinforcement methods available for use which means no one particular gage fits all situations. This itemized account will make things clearer as to the intent of this change.

Bibliography

SMACNA Duct Construction Standards, 2005, Table A-1 and A-3; Sheet Metal and Air Conditioning Contractors National Association, Inc.; Chantilly, VA.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

PART I – IMC

Committee Action:

Approved as Modified

Modify proposal as follows:

307.2.3 Auxiliary and secondary drain systems. In addition to the requirements of Section 307.2.1, a secondary drain or auxiliary drain pan shall be required for each cooling or evaporator coil or fuel-fired appliance that produces condensate, where damage to any building components will occur as a result of overflow from the equipment drain pan or stoppage in the condensate drain piping. One of the following methods shall be used:

1. An auxiliary drain pan with a separate drain shall be provided under the coils on which condensation will occur. The auxiliary pan drain shall discharge to a conspicuous point of disposal to alert occupants in the event of a stoppage of the primary drain. The pan shall have a minimum depth of 1.5 inches (38 mm), shall not be less than 3 inches (76 mm) larger than the unit or the coil dimensions in width and length and shall be constructed of corrosion-resistant material. Galvanized sheet steel pans shall have a minimum thickness of not less than 0.0236-inch (0.6010 mm) (No. 24 gage) ~~galvanized sheet metal~~. Nonmetallic pans shall have a minimum thickness of not less than 0.0625-inch (1.6 mm).
2. A separate overflow drain line shall be connected to the drain pan provided with the equipment. Such overflow drain shall discharge to a conspicuous point of disposal to alert occupants in the event of a stoppage of the primary drain. The overflow drain line shall connect to the drain pan at a higher level than the primary drain connection.
3. An auxiliary drain pan without a separate drain line shall be provided under the coils on which condensate will occur. Such pan shall be equipped with a water-level detection device conforming to UL 508 that will shut off the equipment served prior to overflow of the pan. The auxiliary drain pan shall be constructed in accordance with Item 1 of this section.
4. A water level detection device conforming to UL 508 shall be provided that will shut off the equipment served in the event that the primary drain is blocked. The device shall be installed in the primary drain line, the overflow drain line, or in the equipment-supplied drain pan, located at a point higher than the primary drain line connection and below the overflow rim of such pan.

Exception: Fuel-fired appliances that automatically shut down operation in the event of a stoppage in the condensate drainage system.

**TABLE 803.9(1)
MINIMUM CHIMNEY CONNECTOR THICKNESS FOR LOW-HEAT APPLIANCES^a**

DIAMETER OF CONNECTOR (inches)	MINIMUM NOMINAL THICKNESS (galvanized) (inches) (mm)
<u>5 and smaller</u>	<u>0.022 (No. 26 Gage)</u>
<u>Larger than 5 and up to 10</u>	<u>0.028 (No. 24 Gage)</u>
<u>Larger than 10 and up to 16</u>	<u>0.034 (No. 22 Gage)</u>
<u>14 inches and less</u>	<u>0.0157 (.3950 mm) (No. 28 Gage)</u>
<u>Larger than 16 16 and 18 inch^a</u>	<u>0.064 (No. 16 Gage) 0.0187 (.4712 mm) (No. 26 Gage)</u>

For SI: 1 inch = 25.4 mm.

a. ~~For sizes larger than 18 inches SMACNA Duct Construction Standard, Table 3-5 shall apply.~~

(Portions of proposal not shown remain unchanged)

Committee Reason: This code change provides consistency between the I-codes and SMACNA's Duct Construction Standards related to sheet metal thicknesses. Both the decimal and gage designations of thickness have been revised. The modification deleted duplicated language in Section 307.2.3 and reverted Table 803.9(1) back to the current code language because that table is for oil-burning appliance connectors and there was concern that reducing the wall thicknesses was not justified for such high heat applications.

Assembly Action:

None

PART II – IRC-M

Committee Action:

Approved as Modified

Modify proposal as follows:

**TABLE M1803.2
THICKNESS FOR SINGLE-WALL METAL PIPE CONNECTORS^a**

DIAMETER OF CONNECTOR (inches)	GALVANIZED SHEET METAL GAGE NUMBER	MINIMUM THICKNESS (inch) (<u>mm</u>)
<u>Less than 6</u>	<u>26</u>	<u>0.019</u>
<u>6 to 10</u> <u>14 inches and less</u>	<u>24</u> <u>28</u>	<u>0.024</u> <u>0.0157 (.3950 mm)</u>
<u>Over 10 through 16</u> <u>16 and 18 inch^a</u>	<u>22</u> <u>26</u>	<u>0.029</u> <u>0.0187 (.4712 mm)</u>

For SI: 1 inch = 25.4 mm.

a. ~~For sizes larger than 18 inches SMACNA Duct Construction Standard, Table 3-5 shall apply.~~

(Portions of proposal not shown remain unchanged)

Committee Reason: This code change provides consistency between the I-codes and SMACNA's Duct Construction Standards related to decimal and gage designations of sheet metal thicknesses. The modification reverted Table M1803.2 back to the current code language because that table is for oil-burning appliance connectors and there was concern that reducing the wall thicknesses was not justified for such high heat applications.

Assembly Action:

None

PART III – IFGC

Committee Action:

Approved as Submitted

Committee Reason: The proposed revisions make the code more user-friendly by providing a gage number in addition to a minimum thickness number. For consistency, the gage number designations and thicknesses have been aligned with those in the SMACNA duct construction standard.

Assembly Action:

None

PART IV – IBC FIRE SAFETY

Committee Action:

Approved as Modified

Modify proposal as follows:

716.5.3 (Supp) Shaft enclosures. Shaft enclosures that are permitted to be penetrated by ducts and air transfer openings shall be protected with approved fire and smoke dampers installed in accordance with their listing.

Exceptions:

1. Fire dampers are not required at penetrations of shafts where:
 - 1.1. Steel exhaust subducts are extended at least 22 inches (559 mm) vertically in exhaust shafts, provided there is a continuous airflow upward to the outside; or
 - 1.2. Penetrations are tested in accordance with ASTM E119 or UL263 as part of the fire-resistance rated assembly; or
 - 1.3. Ducts are used as part of an approved smoke control system designed and installed in accordance with Section 909 and where the fire damper will interfere with the operation of the smoke control system; or
 - 1.4. The penetrations are in parking garage exhaust or supply shafts that are separated from other building shafts by not less than 2-hour fire-resistance-rated construction.
2. In Group B and R occupancies, equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1, smoke dampers are not required at penetrations of shafts where:
 - 2.1. Kitchen, clothes dryer, bathroom and toilet room exhaust openings are installed with steel exhaust subducts, having a minimum wall thickness of 0.187-inches (0.4712 mm) (No. 26 Gage)
 - 2.2. That extend at least 22 inches (559 mm) vertically; and
 - 2.3. An exhaust fan is installed at the upper terminus of the shaft that is, powered continuously in accordance with the provisions of Section 909.11, so as to maintain a continuous upward airflow to the outside.
3. Smoke dampers are not required at penetration of exhaust or supply shafts in parking garages that are separated from other building shafts by not less than 2-hour fire-resistance-rated construction.
4. Smoke dampers are not required at penetrations of shafts where ducts are used as part of an approved mechanical smoke control system designed in accordance with Section 909 and where the smoke damper will interfere with the operation of the smoke control system.
5. Fire dampers and combination fire/smoke dampers are not required in kitchen and clothes dryer exhaust system when installed in accordance with the *International Mechanical Code*.

716.5.4 (Supp) Fire partitions. Ducts and air transfer openings that penetrate fire partitions shall be protected with listed fire dampers installed in accordance with their listing.

Exceptions: In occupancies other than Group H, fire dampers are not required where any of the following apply:

1. The partitions are tenant separation or corridor walls in buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2 and the duct is protected as a through penetration in accordance with Section 712.
2. Tenant partitions in covered mall buildings where the walls are not required by provisions elsewhere in the code to extend to the underside of the floor or roof sheathing, slab or deck above.
3. The duct system is constructed of approved materials in accordance with the *International Mechanical Code* and the duct penetrating the wall complies with all of the following requirements:
 - 3.1. The duct shall not exceed 100 square inches (0.06 m²).
 - 3.2. The duct shall be constructed of steel ~~a minimum of 0.0217-inch (0.55 mm) in thickness~~ ~~having a minimum thickness of 0.0157 inches (0.3950 mm) (No. 28 Gage).~~
 - 3.3. The duct shall not have openings that communicate the corridor with adjacent spaces or rooms.
 - 3.4. The duct shall be installed above a ceiling.
 - 3.5. The duct shall not terminate at a wall register in the fire-resistance-rated wall.
 - 3.6. A minimum 12-inch-long (305 mm) ~~by 0.060-inch thick (1.52 mm)~~ steel sleeve ~~having a minimum thickness of 0.0575 inches (1.465 mm) (No. 16 Gage)~~ shall be centered in each duct opening. The sleeve shall be secured to both sides of the wall and all four sides of the sleeve with minimum 1 1/2-inch by 1 1/2-inch by 0.060-inch (38 mm by 38 mm by 1.52 mm) steel retaining angles. The retaining angles shall be secured to the sleeve and the wall with No. 10 (M5) screws. The annular space between the steel sleeve and the wall opening shall be filled with mineral wool batting on all sides.

716.6.1(Supp) Through penetrations. In occupancies other than Groups I-2 and I-3, a duct constructed of approved materials in accordance with the *International Mechanical Code* that penetrates a fire-resistance-rated floor/ceiling assembly that connects not more than two stories is permitted without shaft enclosure protection, provided a listed fire damper is installed at the floor line or the duct is protected in accordance with Section 712.4. For air transfer openings, see Exception 7 to Section 707.2.

Exception: A duct is permitted to penetrate three floors or less without a fire damper at each floor, provided it meets all of the following requirements:

1. The duct shall be contained and located within the cavity of a wall and shall be constructed of steel having a minimum wall thickness of 0.0187-inches ((0.4712 mm) (No. 26 Gage).
2. The duct shall open into only one dwelling or sleeping unit and the duct system shall be continuous from the unit to the exterior of the building.
3. The duct shall not exceed 4-inch (102 mm) nominal diameter and the total area of such ducts shall not exceed 100 square inches (0.065 m²) in any 100 square feet (9.3 m²) of floor area.
4. The annular space around the duct is protected with materials that prevent the passage of flame and hot gases sufficient to ignite cotton waste where subjected to ASTM E 119 or UL 263 time-temperature conditions under a minimum positive pressure differential of 0.01-inch (2.49 Pa) of water at the location of the penetration for the time period equivalent to the fire-resistance rating of the construction penetrated.
5. Grille openings located in a ceiling of a fire-resistance- rated floor/ceiling or roof/ceiling assembly shall be protected with a listed ceiling radiation damper installed in accordance with Section 716.6.2.1.

Committee Reason: The committee agreed that this revised language was appropriate to bring consistency in language as it relates to decimals and gages stated within the code. Further, the committee agreed that the modification adding the term “wall” in two places to define thickness was an appropriate clarification. Lastly, the committee agreed with the modification to undo the proposed changes for items 3.2 and 3.6 of Section 716.5.4 based on the fact that these thicknesses were based on specific testing results.

Assembly Action:

None

Public Hearing Results

M16-07/08, Part I	AM
M16-07/08, Part II	AM
M16-07/08, Part III	AS
M16-07/08, Part IV	AM

2006 INTERNATIONAL PLUMBING CODE

Code Change No: **P10-07/08**

Original Proposal

Section: 310.4

Proponent: A. Brooks Ballard, Virginia Department of Corrections

Revise as follows:

310.4 Water closet compartment. Each water closet utilized by the public or employees shall occupy a separate compartment with walls or partitions and a door enclosing the fixtures to ensure privacy.

Exceptions:

1. Water closet compartments shall not be required in a single-occupant toilet room with a lockable door.
2. Toilet rooms located in day care and child-care facilities and containing two or more water closets shall be permitted to have one water closet without an enclosing compartment.
3. This provision is not applicable to toilet areas located within Group I-3 housing areas.

Reason: Occupants of an I-3 facility must be watched closely to assure that they do not harm others or themselves. This clarification is needed to assure supervision and sightlines needed for security in detention and correctional facilities is allowed to be maintained.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The absence of compartments or partitions in I-3 housing is necessary for monitoring inmates for illegal activities.

Assembly Action:

None

Final Hearing Results

P10-07/08

AS

Code Change No: P15-07/08

Original Proposal

Table 403.1 (IBC [P] Table 2902.1)

Proponent: Paul Rimel, City of Staunton, VA, representing Virginia Plumbing & Mechanical Inspectors Association

Revise table as follows:

**TABLE 403.1 ((Table [P] 2902.1) (Supp)
MINIMUM NUMBER OF REQUIRED PLUMBING FIXTURES^a
(See Sections 403.2 and 403.3)**

No.	CLASSIFICATION	OCCUPANCY	DESCRIPTION	WATER CLOSETS	LAVATORIES	BATHTUBS/ SHOWERS
5	Institutional	I-4	Adult day care and child care	1 per 15	1 per 15	<u>1</u>

(Portions of table and footnotes not shown remain unchanged)

Reason: At least one bathtub or shower should be provided to ensure sanitary conditions in this use group. Such facilities are commonly needed to bath clients that have soiled themselves.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The decision on whether a tub or shower is needed for these occupancies is the responsibility of the facility owner. Some licensing agencies prohibit bathtubs or showers in child and adult care facilities.

Assembly Action:

Approved as Submitted

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because an assembly action was successful.

Final Hearing Results

P15-07/08

AS

Code Change No: **P16-07/08**

Original Proposal

Table 403.1 (IBC [P] Table 2902.1)

Proponent: A. Brooks Ballard, Virginia Department of Corrections

Revise table as follows:

TABLE 403.1 (IBC [P] Table 2902.1) (Supp)
MINIMUM NUMBER OF REQUIRED PLUMBING FIXTURES^a
(See Sections 403.2 and 403.3)

NO.	CLASSIFICATION	OCCUPANCY	DESCRIPTION	WATER CLOSET (URINALS SEE SECTION 419.2)		LAVATORIES		BATHTUBS/SHOWERS	DRINKING FOUNTAIN ^e (SEE SECTION 410.1)	OTHER
				MALE	FEMALE	MALE	FEMALE			
5	Institutional	I-3	Prisons ^b	1 per cell		1 per cell		1 per 15	1 per 100	1 service sink
			Reformatories, detention centers and correctional centers ^b	1 per 15		1 per 15		1 per 15	1 per 100	1 service sink
			<u>Employees^b</u>	<u>1 per 25</u>		<u>1 per 35</u>		-----	<u>1 per 100</u>	-----
		I-4	Adult day care and child care	1 per 15		1 per 15		-----	1 per 100	1 service sink

(Portions of table and footnotes not shown remain unchanged)

Reason: This change brings consistency with I-2 in Table 403.1 for employees in I-3 use group.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Submitted

Committee Reason: The proposal provides for consistency between I-2 employee requirements and I-3 employee requirements in Table 403.1.

Assembly Action:

None

Public Hearing Results

P16-07/08

AS

Code Change No: **P17-07/08**

Original Proposal

Table 403.1 (IBC [P] Table 2902.1)

Proponent: Don Davies, Salt Lake City Corp., representing Utah Chapter ICC

Revise table by adding footnote e to every entry in the “Drinking Fountain” column:

TABLE 403.1 (Supp) (IBC TABLE [P] 2902.1) (Supp)
MINIMUM NUMBER OF REQUIRED PLUMBING FIXTURES^a
(See Sections 403.2 and 403.3)

NO.	CLASSIFICATION	OCCUPANCY	DESCRIPTION	WATER CLOSET (URINALS SEE SECTION 419.2)		LAVATORIES		BATHTUBS/SHOWERS	DRINKING FOUNTAIN ^b (SEE SECTION 410.1)	OTHER
				MALE	FEMALE	MALE	FEMALE			

(Portions of table not shown remain unchanged)

- a. The fixtures shown are based on one fixture being the minimum required for the number of persons indicated or any fraction of the number of persons indicated. The number of occupants shall be determined by the *International Building Code*.
- b. Toilet facilities for employees shall be separate from facilities for inmates or patients.
- c. A single-occupant toilet room with one water closet and one lavatory serving not more than two adjacent patient sleeping units shall be permitted where such room is provided with direct access from each patient room and with provisions for privacy.
- d. The occupant load for seasonal outdoor seating and entertainment areas shall be included when determining the minimum number of facilities required.
- e. Drinking fountains are not required for occupant loads fewer than 50.

Reason: Now that two drinking fountains are required in I.B.C. Section 1109.5.1 for high and low spouts the requirement for drinking fountains becomes excessive for smaller spaces. There is currently no lower limit for the requirement for drinking fountains in the code. The requirement for two restrooms starts at 15 occupants and for retail sales starts at 50 occupants and yet there is no lower limit for drinking fountains. Typically smaller offices provide bottled water or an ice and water dispenser on the refrigerator. Because there is no lower limit we feel that this requirement is ignored or overlooked in smaller occupant load areas anyway and because of that they may be overlooked altogether even in larger spaces. By requiring a reasonable lower limit we feel that this requirement will be more often enforced overall.

Cost Impact: The code change proposal will not increase the cost of construction. This proposal actually reduces the cost of construction by eliminating the requirement for drinking fountains in smaller buildings and spaces.

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: Drinking water is a basic necessity that must be provided for in all buildings, regardless of the occupant load.

Assembly Action:

None

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because public comments were submitted.

Public Comment 2:

Don K. Davies, Salt Lake City Corporation, representing Utah Chapter of ICC, requests Approval as Modified.

Modify proposal as follows:

**TABLE 403.1 (Supp) (IBC TABLE [P] 2902.1) (Supp)
MINIMUM NUMBER OF REQUIRED PLUMBING FIXTURES^a
(See Sections 403.2 and 403.3)**

NO.	CLASSIFICATION	OCCUPANCY	DESCRIPTION	WATER CLOSET (URINALS SEE SECTION 419.2)		LAVATORIES		BATHTUBS/SHOWERS	DRINKING FOUNTAIN ^b (SEE SECTION 410.1)	OTHER
				MALE	FEMALE	MALE	FEMALE			

(Portions of table not shown remain unchanged)

- The fixtures shown are based on one fixture being the minimum required for the number of persons indicated or any fraction of the number of persons indicated. The number of occupants shall be determined by the *International Building Code*.
- Toilet facilities for employees shall be separate from facilities for inmates or patients.
- A single-occupant toilet room with one water closet and one lavatory serving not more than two adjacent patient sleeping units shall be permitted where such room is provided with direct access from each patient room and with provisions for privacy.
- The occupant load for seasonal outdoor seating and entertainment areas shall be included when determining the minimum number of facilities required.
- Drinking fountains are not required for an occupant loads of 15 or fewer ~~than 50~~.

Commenter's Reason: Now that two drinking fountains are required in I.B.C. Section 1109.5.1 for high and low spouts the requirement for drinking fountains becomes excessive for smaller spaces. There is currently no lower limit for the requirement for drinking fountains in the code. The requirement for two restrooms starts at 15 occupants and for retail sales starts at 50 occupants and yet there is no lower limit for drinking fountains. Typically smaller offices are provided with break rooms which have sinks in them which can be used for drinking water or a water dispenser is provided in the refrigerator. We have reduced the lower limit from 49 to 15 occupants to align with the requirements where two restrooms are required. Because there is no lower limit we feel that this requirement is ignored or overlooked in smaller occupant load areas anyway and because of that they may be overlooked altogether even in larger spaces. By requiring a reasonable lower limit we feel that this requirement will be more uniformly enforced overall.

Final Hearing Results

P17-07/08

AMPC2

Code Change No: P26-07/08

Original Proposal

Sections: 403.4, 403.4.1(New)

Proponent: Guy Tomberlin, Fairfax County, VA, representing himself

1. Revise as follows:

403.4 Required public toilet facilities. Customers, patrons and visitors shall be provided with public toilet facilities in structures and tenant spaces intended for public utilization. ~~The accessible route to public facilities shall not pass through kitchens, storage rooms, closets or similar spaces.~~ The number of plumbing fixtures located within the required toilet facilities shall be provided in accordance with Section 403 for all users. Employees shall be provided with toilet facilities in all occupancies. Employee toilet facilities shall be either separate or combined employee and public toilet facilities.

2. Add new text as follows:

403.4.1 Access. The route to the public toilet facilities required by Section 403.4 shall not pass through kitchens, storage rooms and closets and shall not cross a property line other than onto a public way. Access to the required facilities shall be from within the building or from the exterior of the building. All routes shall comply with the accessibility requirements of the *International Building Code*. The public shall have access to the required toilet facilities at all times that the building is occupied.

CODE CHANGES RESOURCE COLLECTION – INTERNATIONAL BUILDING CODE

Reason: This proposed change provides useful guidance that the current code does not contain. The situation where the required plumbing facilities are located outside of the actual building itself is not an uncommon practice. However current code fails to state whether this type of configuration is permitted or prohibited. There are 3 basic areas of concern that this proposal attempts to resolve. 1) Yes, facilities do not have to be within the structure itself, as long as they are within the current requirements for maximum distance. 2) The required facilities shall always be open and available to all the intended users at all times of occupancy. 3) The current minimum fixture requirements and calculations are applicable and accountable for all intended users of the facilities.

During the final action hearings in Rochester it was stated that the code was already “clear on this subject and everyone knows the bathrooms are required inside of the structures.” This statement begs the questions:

1. What about gas stations? A typical gas station design requires that you walk outside of the structure and around the side to gain access to the bathrooms.
2. What about a typical outlet mall situation? It is not uncommon for a “strip” type outlet mall (a design that requires you travel outdoors to get from one store to the next) to provide bathrooms in one central location for several stores. Sometimes these facilities may be located out in a parking lot as long as the permitted travel distances are not exceeded.
3. Lastly what about Use Group A 5, bleachers? How do you install bathroom fixtures in a structure where no indoor area exists?

These 3 examples are common everyday designs that occur routinely across the US. So why not have the code say that this type of installation is acceptable instead of leaving it up to local interpretation?

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing Results

Committee Action:

Approved as Modified

Modify the proposal as follows:

403.4 Required public toilet facilities. Customers, patrons and visitors shall be provided with public toilet facilities in structures and tenant spaces intended for public utilization. The number of plumbing fixtures located within the required toilet facilities shall be provided in accordance with Section 403 for all users. Employees shall be provided with toilet facilities in all occupancies. Employee toilet facilities shall be either be separate or combined employee and public toilet facilities.

403.4.1 Access. The route to the public toilet facilities required by Section 403.4 shall not pass through kitchens, storage rooms ~~and or~~ closets ~~and shall not cross a property line other than onto a public way.~~ Access to the required facilities shall be from within the building or from the exterior of the building. All routes shall comply with the accessibility requirements of the *International Building Code*. The public shall have access to the required toilet facilities at all times that the building is occupied.

Committee Reason: The proposed text resolves the current code’s silence on whether toilet rooms can be accessed from the exterior of a building. The modification deletes the reference to property line because they do not have any impact on the location of toilet facilities.

Assembly Action:

None

Final Hearing Results

P26-07/08

AM

2006 INTERNATIONAL RESIDENTIAL CODE

Code Change No: **RB227-07/08**

Original Proposal

Sections: AG 106.1, AG106.2, AG106.3, AG106.4, AG106.4.1, AG106.4.2, AG106.4.3, AG106.4.4, AG106.4.5, AG106.5, AG106.6, AG 108; IBC 3109.5, 3109.5.1, 3109.5.2, 3109.5.3, 3109.5.4, Chapter 35

Proponent: Lorraine Ross, Intech Consulting, Inc., representing the Association of Pool and Spa Professionals

THESE PROPOSALS ARE ON THE AGENDA OF THE IRC BUILDING/ENERGY AND THE IBC GENERAL CODE DEVELOPMENT COMMITTEES AS 2 SEPARATE CODE CHANGES. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IRC

1. Delete and substitute as follows:

~~**AG106.1 General.** Suction outlets shall be designed to produce circulation throughout the pool or spa. Single outlet systems, such as automatic vacuum cleaner systems, or multiple suction outlets, whether isolated by valves or otherwise, shall be protected against user entrapment.~~

AG106.1 Suction entrapment avoidance. Pools, spas, hot tubs, catch basins and other similar bather accessible bodies of water associated with swimming pool construction shall be designed to produce circulation throughout the body of water and provide means to protect against user suction entrapment in accordance with ANSI/APSP 7.

2. Delete without substitution:

~~**AG106.2 Suction fittings.** Pool and spa suction outlets shall have a cover that conforms to ANSI/ASME A112.19.8M, or an 18 inch×23 inch (457mmby 584 mm) drain grate or larger, or an approved channel drain system.~~

~~**Exception:** Surface skimmers~~

~~**AG106.3 Atmospheric vacuum relief system required.** Pool and spa single or multiple-outlet circulation systems shall be equipped with atmospheric vacuum relief should grate covers located therein become missing or broken. This vacuum relief system shall include at least one approved or engineered method of the type specified herein, as follows:~~

- ~~1. Safety vacuum release system conforming to ASME A112.19.17; or~~
- ~~2. An approved gravity drainage system.~~

~~**AG106.4 Dual drain separation.** Single or multiple pump circulation systems shall be provided with a minimum of two suction outlets of the approved type. A minimum horizontal or vertical distance of 3 feet (914 mm) shall separate the outlets. These suction outlets shall be piped so that water is drawn through them simultaneously through a vacuum-relief-protected line to the pump or pumps.~~

~~**AG106.5 Pool cleaner fittings.** Where provided, vacuum or pressure cleaner fitting(s) shall be located in an accessible position(s) at least 6 inches (152 mm) and not more than 12 inches (305 mm) below the minimum operational water level or as an attachment to the skimmer(s).~~

3. Add standard in Section AG108 as follows:

ANSI/APSP-7-06 Standard for Suction Entrapment Avoidance in Swimming Pools, Wading Pools, Spas, Hot Tubs, and Catch Basins

CODE CHANGES RESOURCE COLLECTION – INTERNATIONAL BUILDING CODE

Reason: This proposal adds a new standard, ANSI/APSP 7 Standard for Suction Entrapment Avoidance in Swimming Pools, Wading Pools, Spas, Hot Tubs, and Catch Basins into IRC Section AG 106. It also deletes Sections AG 106.2 through AG 106.6 because all of these requirements have been incorporated into ANSI/APSP 7.

The current code language was an early response to body entrapment only. New information and technology has contributed to this new ANSI/APSP consensus standard and addresses all forms of entrapment, including the underlying causes of entrapment.

Although rare, entrapment of bathers at suction outlets in pools and spas has gained considerable attention over the last decade, resulting in voluntary standards, building codes, and proposed national legislation to prevent these tragic accidents.

A survey of the Epidemiological Reports on Suction Entrapment collected by the U.S. Consumer Product Safety Commission by the Association of Pool and Spa Professionals (APSP) Technical Committee yielded 5 distinct modes of Entrapment:

Entrapment Type	Percentage of Incidents
Hair Entrapment - Hair becomes knotted or snagged in an outlet cover	33%
Limb Entrapment – A limb sucked or inserted into an opening of a circulation outlet with a broken or missing cover resulting in a mechanical bind or swelling	28%
Body Entrapment – Suction applied to a large portion of the body or limbs resulting in an entrapment	33%
Evisceration/Disembowelment – suction applied directly to the intestines by a circulation outlet with a broken or missing cover.	3%
Mechanical Entrapment - Potential for jewelry, swimsuit, hair decorations, finger, toe, or knuckle to be mechanically caught in an opening of a suction outlet or cover.	Included in limb

Early actions to address entrapment were aimed at *body* entrapment by attempting to control the suction pressure at the drain itself.

Unfortunately, these devices do not protect against the major forms of entrapment: hair or evisceration. **Additionally, if the pool circulation pump is off - meaning no suction at the outlet - a child can still get a limb trapped if there is a broken or missing cover.**

Suction is only one factor to control in entrapment avoidance.

In order to address avoidance of all forms of entrapment, a comprehensive study of the causes of all types of entrapment was undertaken. It is now known that there are three basic underlying physical phenomena that govern all 5 modes of entrapment:

- Suction (or delta pressure)
- Water flow rate through the outlet or cover
- Mechanical binding

The Technical Committee of the Association of Pool and Spa Professionals (APSP) examined various means to prevent these types of entrapments recognizing the diverse nature of pool construction. Using this knowledge, a new national consensus standard was developed in accordance with the American National Standards Institute (ANSI) process. ANSI/APSP 7 *Standard for Suction Entrapment Avoidance in Swimming Pools, Wading Pools, Spas, Hot tubs, and Catch Basins (ANSI/APSP 7)* is based upon sound engineering principles, research, and field experience, that, when applied properly, provides the most comprehensive approach to protect bathers against all modes of entrapment. The ANSI standard approval process itself ensured that a wide variety of stakeholders were involved in the development of this standard, including building code officials, governmental health and pool industry experts.

The ANSI/APSP 7 standard applies to both commercial and residential pools, for flow rates from a few gallons per minute to thousands of gallons per minute. Although it includes the use of devices or systems that prevent suction, it also expands the lists of options for the pool contractor, while maintaining necessary protective principles.

ANSI/APSP-7 contains design performance criteria including components, devices and related technology installed to protect against entrapment. Analysis of past entrapments along with extensive testing shows:

- An outlet cover that complies with ASME/ANSI A112.19.8 will protect against limb, evisceration and mechanical entrapment

If the cover is missing or broken, there is no single device or system that can protect against entrapment. **For example, if the pool circulation pump is off - meaning no suction at the outlet - a child can still get a limb mechanically trapped,**

Therefore, ANSI/APSP 7 contains a warning to shut down the pool.

Unlike suction release devices that must be tested monthly, a pool owner can easily see if the cover is broken or missing. Having a SVRS with a missing or broken cover does not protect against limb, hair or mechanical entrapment and may give a pool owner a false sense of security regarding entrapment prevention.

- The maximum water flow rate in ANSI/APSP-7 is based on 6 fps and when combined with the required outlet cover provides protection against hair, limb, evisceration and mechanical entrapment.

Testing shows that water flow has a significant impact on entrapment avoidance.

- When used with a proper outlet cover and maximum water flow rate, options to address body entrapment in ANSI/APSP-7 include:
 - Dual Outlets at least 36" apart, measured center to center
 - Three or more outlets
 - Single Unblockable
 - Swim Jet
 - Alternative Suction System
 - Gravity Flow Systems
 - Outlet pumps in Series plus
 - SVRS, or
 - Vent, or
 - Additional Suction

The ability of dual drains to prevent body entrapment was recently demonstrated by a series of tests conducted by the APSP Technical Committee. Results showed that even with one drain blocked and a missing cover on the other, the low water flow rate mandated by ANSI/APSP-7 prevented the necessary suction to hold down the 15 lb buoyant block used as a "pass" criteria when testing SVRS.

This test series illustrates the importance of water flow at the outlet when developing entrapment avoidance measures.

ANSI/APSP-7 utilizes the most comprehensive approach to outlet entrapment because it considers all underlying causes: suction, water flow and mechanical – while recognizing the diverse nature of pool and spa design. It covers all 5 forms of entrapment.

Tests conducted on dual outlets configured as described in ANSI/APSP-7 demonstrate:

- The size of the outlets and piping do have an effect on safe installation
- Water velocity of 6 fps (ANSI/APSP-7 maximum) *passed* an analogous ASME/ASTM SVRS test protocol,
- The combination of maximum water flow rates and dual outlets prevent body entrapment (with no SVRS), even if one outlet is blocked.
- Dual outlets, when installed according to ANSI/APSP-7, pass the same test criteria as the SVRS in both ASME/ANSI A112.19.17-2002 and ASTM F2387-2003, reacting faster than the 3 seconds response time and work properly in combination with skimmers.

Using submerged piping as is found in pools and spas, tests conducted on SVRS systems and both the ASME/ASTM SVRS standards demonstrate:

- Not all SVRS tested to the ASME/ASTM SVRS Standards will reliably "trip" when combined with dual outlets and/or skimmers – Those that fail seem to interpret residual flow from the second outlet as a priming pump.
- Not all SVRS tested to the ASME/SVRS Standards "trip" with partial outlet blockage.
- Water dynamics, in particular water hammer can facilitate release. Once the block is forced off the cover by these spikes in pressure, it floats to the surface. Neutrally buoyant blocks have been documented to "hammer" on and off open pipes for several seconds.
- Water dynamics continue for several seconds. The longest on an SVRS test lasted 2.72 seconds, which may call into question the 3 second limit.

Tests conducted on a U-Tube Vent on a single 18 x 18 suction outlet demonstrates:

- A single 18 x 18 drain grate can be successfully vented operating at 420 gpm with a 1 inch PVC vent pipe.
- Release is very fast – shortest release was 2.5 seconds
- While it was difficult to completely block the drain using a Human test subject, it was possible to do so sufficiently to trip the vent. The actual suction sensation of this experience was far less than what is experienced when an 8 inch sump is blocked.

ANSI/APSP -7 is the appropriate national consensus standard that is recommended for adoption in building codes. It has taken into account the initial steps taken in the building codes for specific devices and has expanded entrapment protection to include all 5 forms of entrapment by controlling all 3 underlying entrapment causes. In short, pool and spas designed and installed in accordance with ANSI/APSP – 7 are safer than those that rely upon a single device alone.

The technical committee of APSP is committed to continuing the effort to seek new understanding and knowledge regarding entrapment avoidance. Education of building code officials, legislators, pool designers and contractors and pool owners will always be a major activity of the APSP.

Cost Impact: The code change proposal will not increase the cost of construction.

PART II – IBC GENERAL

1. Delete and substitute as follows:

~~**3109.5 Entrapment avoidance.** Suction outlets shall be designed to produce circulation throughout the pool or spa. Single outlet systems, such as automatic vacuum cleaner systems, or other such multiple suction outlets whether isolated by valves or otherwise shall be protected against user entrapment.~~

3109.5 Suction entrapment avoidance. Pools, spas, hot tubs, catch basins and other similar bather accessible bodies of water associated with swimming pool construction shall be designed to produce circulation throughout the body of water and provide means to protect against user suction entrapment in accordance with ANSI/APSP 7.

2. Delete without substitution:

~~**3109.5.1 Suction fittings.** All pool and spa suction outlets shall be provided with a cover that conforms to ASME A112.19.8M, a 12-inch by 12-inch (305 mm by 305 mm) drain grate or larger, or an approved channel drain system.~~

~~**Exception:** Surface skimmers.~~

~~**3109.5.2 Atmospheric vacuum relief system required.** All pool and spa single or multiple outlet circulation systems shall be equipped with an atmospheric vacuum relief approved or engineered method of the type specified herein, as follows:~~

- ~~1. Safety vacuum release systems conforming to ASME A112.19.17; or~~
- ~~2. Approved gravity drainage system.~~

~~**3109.5.3 Dual drain separation.** Single or multiple pump circulation systems shall be provided with a minimum of two suction outlets of the approved type. A minimum horizontal or vertical distance of 3 feet (914 mm) shall separate such outlets. These suction outlets shall be piped so that water is drawn through them simultaneously through a vacuum-relief-protected line to the pump or pumps.~~

~~**3109.5.4 Pool cleaner fittings.** Where provided, vacuum or pressure cleaner fitting(s) shall be located in an accessible position(s) at least 6 inches (152 mm) and not greater than 12 inches (305 mm) below the minimum operational water level or as an attachment to the skimmer(s).~~

3. Add standard to Chapter 35 as follows:

ANSI/APSP-7-06 Standard for Suction Entrapment Avoidance in Swimming Pools, Wading Pools, Spas, Hot Tubs, and Catch Basins

Reason: This proposal adds a new standard, ANSI/APSP 7 Standard for Suction Entrapment Avoidance in Swimming Pools, Wading Pools, Spas, Hot Tubs, and Catch Basins into IBC Section 3109.5. It also deletes Sections 3109.5.1 through 3109.5.5 because all of these requirements have been incorporated into ANSI/APSP 7.

The current code language was an early response to body entrapment only. New information and technology has contributed to this new ANSI/APSP consensus standard and addresses all forms of entrapment, including the underlying causes of entrapment.

Although rare, entrapment of bathers at suction outlets in pools and spas has gained considerable attention over the last decade, resulting in voluntary standards, building codes, and proposed national legislation to prevent these tragic accidents.

A survey of the Epidemiological Reports on Suction Entrapment collected by the U.S. Consumer Product Safety Commission by the Association of Pool and Spa Professionals (APSP) Technical Committee yielded 5 distinct modes of Entrapment:

Entrapment Type	Percentage of Incidents
Hair Entrapment - Hair becomes knotted or snagged in an outlet cover	33%
Limb Entrapment – A limb sucked or inserted into an opening of a circulation outlet with a broken or missing cover resulting in a mechanical bind or swelling	28%
Body Entrapment – Suction applied to a large portion of the body or limbs resulting in an entrapment	33%
Evisceration/Disembowelment – suction applied directly to the intestines by a circulation outlet with a broken or missing cover.	3%
Mechanical Entrapment - Potential for jewelry, swimsuit, hair decorations, finger, toe, or knuckle to be mechanically caught in an opening of a suction outlet or cover.	Included in limb

Early actions to address entrapment were aimed at *body* entrapment by attempting to control the suction pressure at the drain itself. Unfortunately, these devices do not protect against the major forms of entrapment: hair or evisceration. **Additionally, if the pool circulation pump is off - meaning no suction at the outlet - a child can still get a limb trapped if there is a broken or missing cover.**

Suction is only one factor to control in entrapment avoidance.

In order to address avoidance of all forms of entrapment, a comprehensive study of the causes of all types of entrapment was undertaken. It is now known that there are three basic underlying physical phenomena that govern all 5 modes of entrapment:

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If the cover is missing or broken, there is no single device or system that can protect against entrapment. **For example, if the pool circulation pump is off - meaning no suction at the outlet - a child can still get a limb mechanically trapped,**

Therefore, ANSI/APSP 7 contains a warning to shut down the pool.

Unlike suction release devices that must be tested monthly, a pool owner can easily see if the cover is broken or missing. Having a SVRS with a missing or broken cover does not protect against limb, hair or mechanical entrapment and may give a pool owner a false sense of security regarding entrapment prevention.

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- The size of the outlets and piping do have an effect on safe installation
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Using submerged piping as is found in pools and spas, tests conducted on SVRS systems and both the ASME/ASTM SVRS standards demonstrate:

- Not all SVRS tested to the ASME/ASTM SVRS Standards will reliably "trip" when combined with dual outlets and/or skimmers – Those that fail seem to interpret residual flow from the second outlet as a priming pump.
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- While it was difficult to completely block the drain using a Human test subject, it was possible to do so sufficiently to trip the vent. The actual suction sensation of this experience was far less than what is experienced when an 8 inch sump is blocked.

ANSI/APSP -7 is the appropriate national consensus standard that is recommended for adoption in building codes. It has taken into account the initial steps taken in the building codes for specific devices and has expanded entrapment protection to include all 5 forms of entrapment by controlling all 3 underlying entrapment causes. In short, pool and spas designed and installed in accordance with ANSI/APSP – 7 are safer than those that rely upon a single device alone.

The technical committee of APSP is committed to continuing the effort to seek new understanding and knowledge regarding entrapment avoidance. Education of building code officials, legislators, pool designers and contractors and pool owners will always be a major activity of the APSP.

Cost Impact: This code change proposal will not increase the cost of construction

Public Hearing Results

PART I – IRC

Committee Action:

Disapproved

Committee Reason: This is a critical safety issue. The organizations need to work together to bring back a proposal that gives us better guidance. Section AG106.1 is poorly written. It is not known what is meant by "similar bather accessible bodies of water associated with swimming pools construction". Section AG106.1 is not the language directly out of the standard. This could be interpreted to apply to a drainage pond or goldfish pond in the yard. Also, this section will require all pools to have a circulation system and there are some pools that do not require this.

Assembly Action:

None

PART II – IBC GENERAL

Committee Action:

Disapproved

Committee Reason: Based upon proponents request.

Assembly Action:

None

Public Comments

Individual Consideration Agenda

This item is on the agenda for individual consideration because public comments were submitted for Part I.

Public Comment 2:

Lorraine Ross, Intech Consulting Inc., representing the Association of Pool and Spa Professionals, requests Approval as Modified by this Public Comment.

Modify proposal as follows:

~~AG106.1 Suction entrapment avoidance. Pools, spas, hot tubs, catch basins and other similar bather accessible bodies of water associated with swimming pool construction shall be designed to produce circulation throughout the body of water and provide means to protect against user suction entrapment in accordance with ANSI/APSP-7.~~ **General.** Suction outlets shall be designed and installed in accordance with ANSI/APSP-7.

Revise standard in AG108 as follows:

ASME/ANSI

A112.19.8M-1987(R1996) 8-2007 Suction Fittings for Use in Swimming Pools, Wading Pools, Spas, Hot Tubs and Whirlpool Bathing Appliances

Commenter's Reason: Current 2006 IRC entrapment avoidance language is in direct conflict with The Virginia Graeme Baker Federal Pool and Spa Safety Act, (Act) adopted in December 2007. The Act preempts sections of the IRC, and any code or state law that adopts the 2006 IRC after December 20, 2008 will be in violation of this Act. APSP realizes that this code development cycle will result in the 2009 IBC. So we are working diligently in those states where 2006 adoption has taken place or are contemplating adoption of the 2006 IBC to make necessary amendments to the entrapment avoidance section of the code.

APSP proposes this Public Comment for RB-227 Part I (IRC) to follow the intent of the Federal Act in its findings to increase pool safety by recognizing that there have been great strides in technology and pool and spa design regarding entrapment avoidance.

With respect to entrapment avoidance, the provisions in the new law are consistent with ANSI/APSP-7 American National Standard for Suction Entrapment Avoidance (ANSI/APSP-7). This standard provides that all swimming pools and spas are to use proper anti-entrapment drain covers and circulation and drainage systems. The new standard will eliminate all future risk of all five forms of entrapment in pools and spas designed and installed in accordance with ANSI/APSP-7.

Some of the areas of conflict between the 2006 IRC and the Federal Act:

- As of December 20, 2008, Section 1404 (b) of the Federal Pool and Spa Safety Act expressly prohibits the manufacture sale or introduction into commerce of any drain cover that does not comply with ASME/ANSI A112.19.8 2007. This provision is defined as a "Consumer Product Safety Rule," meaning that the issue has been pre-empted. Hence, under the Consumer Product Safety Act, state and local governments may not establish or continue in effect any standard or regulation designed to deal with this same risk of injury unless said state or local requirements are identical the federal standard. 15 U.S.C. 2075(a).
- The 2006 IRC Section AG108 currently refers to the prior and now superseded 1987 (reaffirmed 1996) edition of the ASME A112.19.8 standard. This modification, which adopts the 2007 version of the standard corrects this conflict between the 2006 IBC and the Federal Act. There are substantial differences between this earlier edition and the 2007 version which is cited in the Act. For example, the newer standard includes enhanced resistance to UV rays, enhanced fastening requirements, resistance to hair entanglement and a new body block test that requires each drain to prevent body entrapment even when installed as a single, blockable drain.
- Section AG 106.2 of the IRC requires ASME 19.8 complaint covers, **or** a grate 12 x 12 **or** larger **or** a channel drain. Section 1404(c)(1) of the Act requires that all outlets/drains in all public pools be protected with ASME A112.19.8 - 2007 covers, regardless of size or shape. .
- Section 1406 of the Act calls for states to allow residential pools that have
 - (I) more than one drain
 - (II) 1 or more unblockable drains, or
 - (III) no main drain)

Section AG106.1 of the IRC states "Suction outlets shall be designed to produce circulation throughout the pool or spa," and code officials have at times interpreted this provision to mean that a pool or spa may not be built without a main drain. This is in direct conflict with the intent of Congress, which is to allow states to permit pools without drains. Elimination of drains is the most effective way to eliminate entrapment injuries.

ANSI/APSP-7 (section 5.2) expressly allows for pools without suction outlets.

- 1406(d)(1) of the Act calls for states to require one of a series of options on residential pools "except for pools constructed without a single main drain." This is consistent with ANSI/APSP-7, which recognizes that SVRS and other shut off devices are only intended to work and are tested to work on pools or spas that have a single source of suction, not pools or spas with multiple drains. The Act also allows for eight backup options including any device which complies with either SVRS standard ASME or ASTM. However, the 2006 IRC section excludes five of these options, ignores one of the recognized SVRS standards cited in the Act and also requires "a backup for another backup" when multiple outlets are present –a clear conflict with the Federal Act. This IRC provision is also not consistent with the Act.

COMPARISON OF FEDERAL POOL AND SPA SAFETY ACT 2007*, ANSI/APSP-7 AND 2006 IRC CODE

Federal Pool & Spa Safety Act of 2007 *	ANSI/APSP-7 (See Note 1)	2006 ICC International Residential Codes
1404 (b) FEDERAL ACT (See Note 2) Requires that all drain (suction outlet) covers be tested and certified to ASME/ANSI A112.19.8-2007	Yes Section 4.5	No Section AG106.2 Exempts drains 18" x 23" or larger Exempts channel drains Permits grates 18" x 23" or larger
1406(a)(1)(A)(iv) <u>GRANT PROGRAM</u> Requires such covers to comply with "any successor standard" or version of ASME/ANSI A112.19.8	Yes Section 4.5	No Section AG108 Standards lists ANSI/ASME A112.19.8M-1987 (R1996) Suction Fittings for Use in Swimming Pools, Wading Pools, Spas, Hot Tubs and Whirlpool Bathing Appliances
1406(d)(1)(A-F) <u>GRANT PROGRAM</u> Existing pools with single drain that is not unblockable to have added protection	Yes Section 6.3	Yes Section AG106.3
1406(d)(1)(A-F) <u>GRANT PROGRAM</u> Allows all options recognized in ASME/ANSI A112.19.17 to protect single drain installations in residential pools and spas	Yes Section 7	No Section AG106.3 Prescriptive language requires "atmospheric vacuum relief" eliminating reversing circulation flow inconsistent with ASME/ANSI A112.19.17 Section 1.4 <i>Safety Vacuum Release System</i>
1406(d)(1)(A-F) <u>GRANT PROGRAM</u> Allows all devices that comply with ASTM F2387 to protect single drain installations in residential pools and spas	Yes Section 7.1	No Section AG106.3 Sub 1. Section AG108 Standards: ASTM F2387 not included
1406(d)(1)(A-F) <u>GRANT PROGRAM</u> Recognizes that SVRS or other devices are not required on pools or spas with multiple drains or an unblockable drain in residential pools	Yes Section 5.5.2	No Section AG3109.5.2

1. ANSI/APSP-7 2006 Standard for Suction Entrapment Avoidance in Swimming Pools, wading Pools, Spas, hot Tubs and Catch Basins.

2. Federal Act refers to section 1404, which creates a Federal Swimming Pool and Spa Drain Cover Standard, and requires that public pools be equipped with certain devices.

* The Federal Pool and Spa safety Act also known as the Virginia Graeme Baker Pool & Spa Safety Act

Adopting ANSI/APSP-7 into the IRC easily satisfies the Federal Act mandates and requirements for the optional grant program for states in regulating residential pools and spas.

ANSI/APSP-7 was reviewed and found to be in compliance with ICC policy regarding consensus standards by the ICC Staff prior to the Code Development Hearings in Palm Springs. The Committee recommended that APSP re-examine the "charging language" regarding the reference to ANSI/APSP-7. This has been accomplished in this modification.

APSP also realizes that this code development cycle will result in the 2009 IRC. So we are working diligently in those states where 2006 adoption has taken place or are contemplating adoption of the 2006 IBC to make necessary amendments to the entrapment avoidance section of the code.

Bibliography:

Title XIV Federal Pool and Spa Safety Act: Posted by the Consumer Product Safety Commission: <http://www.cpsc.gov/pssa.pdf>

"Entrapment Prevention in Pools and Spas" by Shajee Siddiqui, Published in the January-February 2008 issue of *Building Safety Journal*, copyright International Code Council, and is reprinted with permission:

http://www.apsp.org/clientresources/documents/Siddiqui_EntrapmentPools.Spas_reprint.pdf

This item is on the agenda for individual consideration because public comments were submitted for Part II.

Public Comment 2:

Lorraine Ross, Intech Consulting Inc., representing the Association of Pool and Spa Professionals, requests Approval as Modified by this Public Comment.

Modify proposal as follows:

~~**3109.5 Suction entrapment avoidance.** Pools, spas, hot tubs, catch basins and other similar bather accessible bodies of water associated with swimming pool construction shall be designed to produce circulation throughout the body of water and provide means to protect against user suction entrapment in accordance with ANSI/APSP-7.~~

3109.5 Entrapment avoidance. Suction outlets shall be designed and installed in accordance with ANSI/APSP-7.

Commenter's Reason: Same reason as Part I.

Final Hearing Results

RB227-07/08, Part I	AMPC2
RB227-07/08, Part II	AMPC2

CODE CORRELATION COMMITTEE (CCC) 2006-2008

The following information provides a summary of all editorial changes to the 2006 International Building Code, that are reflected in the 2009 International Building Code, as approved by the ICC Code Correlation Committee.

2009 SECTION	2006 SECTION	DESCRIPTION OF REVISION	CCC REF YEAR
Defined Terms		All words that are specifically defined in the code (all codes) shall be italicized when used in their respective code.	2006
101.2 505.4 1509.2.1 2308.1	101.2 505.4 1509.2.1 2308.1	Delete the words "in height" in association with "grade plane" in the following sections: 101.2 Scope. (Exception only) 505.4 Openness. (Exception 5 only) 1509.2.1 Type of construction. (Exceptions 2 and 5 only) 2308.1 General.	2007
106.1 106.2 106.3	1603.2 1603.3 1603.4	Reorganize and Revise as follows: 106.1 406.2 Live loads posted. No change in text. 106.2 406.3 106.3 Issuance of Certificate of occupancy permits for changed loads. A certificate of occupancy permits for buildings hereafter erected required by Section 111 shall not be issued until the floor load signs, required by Section 106.2, have been installed. 106.3 406.1 Restrictions on loading. It shall be unlawful to place, or cause or permit to be placed, on any floor or roof of a building, structure or portion thereof, a load greater than is permitted by these requirements in this code.	2008
307.1	307.1	[F] 307.1 [Supp] High-hazard Group H. (No change to current text.) Exceptions 1-3: (No change to current text.) 4. Cleaning establishments that utilize combustible liquid solvents having a flash point of 140°F (60°C) or higher in closed systems employing equipment listed by an approved testing agency, provided that this occupancy is separated from all other areas of the building by 1-hour fire barriers <u>constructed in accordance with Section 706 or 1-hour horizontal assemblies constructed in accordance with Section 711, or both.</u> Exceptions 5-13: (No change to current text.)	2007
309.1	309.1	309.1 Mercantile Group M. Mercantile Group M occupancy includes, among others, <u>the use of a buildings and or structures or a portion thereof, for the display and sale of merchandise, and involves stocks of goods, wares or merchandise incidental to such purposes and accessible to the public.</u> Mercantile occupancies shall include, but not be limited to, the following: Department stores Drug stores Markets Motor fuel-dispensing facilities Retail or wholesale stores Sales rooms	2007
402.10	402.9	402.9 Smoke control. Where a covered mall building contains an atrium, a smoke control system shall be provided in accordance with Section 404.4. Exceptions: 4. A smoke control system is not required in covered mall buildings when an atrium only connects two stories. 2. An open mall building.	2008
403.3.1 403.3.2 507.9 3310.1		Revise the following sections to read ... "building height": 403.3.1 Type of construction. (Exception 1 only) 403.3.2 Shaft enclosure. 507.8 Aircraft paint hangar. 3310.1 Stairways required.	2007

CODE CHANGES RESOURCE COLLECTION – INTERNATIONAL BUILDING CODE

2009 SECTION	2006 SECTION	DESCRIPTION OF REVISION	CCC REF YEAR						
402.8	402.8	402.8 Interior finish. Interior wall and ceiling finishes within the mall and exits shall have a minimum flame spread index and smoke developed index of Class B in accordance with per Chapter 8. Interior floor finishes shall meet the requirements of Section 804.	2007						
403.5 404.4 407.6 408.9		<p>Add new sections as follows:</p> <p>[F] 403.5 Fire alarm system. A fire alarm system shall be provided in accordance with Section 907.2.12.</p> <p>[F] 404.4 Fire alarm system. A fire alarm system shall be provided in accordance with Section 907.2.13.</p> <p>[F] 407.6 Fire alarm system. A fire alarm system shall be provided in accordance with Section 907.2.6.</p> <p>[F] 408.9 Fire alarm system. A fire alarm system shall be provided in accordance with Section 907.2.6.3.</p>	2007						
403.13 403.18 T. 403.18	403.13 403.18 T. 403.18	<p>403.13 Smokeproof exit enclosures. Every required stairway serving floors more than 75 feet (22 860 mm) above the lowest level of fire department vehicle access shall comply with Sections 909.20 and 1020.1.7.</p> <p>403.18 [Suppl] Sprayed fire-resistive fire-resistant materials (SFRM). The bond strength of the SFRM shall be in accordance with Table 403.18.</p> <p style="text-align: center;">TABLE 403.18 MINIMUM BOND STRENGTH</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>HEIGHT OF BUILDING^a</th> <th>SFRM MINIMUM BOND STRENGTH</th> </tr> </thead> <tbody> <tr> <td>More than 75 feet and up to 420 feet</td> <td>430 psf</td> </tr> <tr> <td>More than 420 feet</td> <td>1,000 psf</td> </tr> </tbody> </table> <p>For SI: 1 foot = 304.8 mm, 1 pound per square foot = 0.0479 kW/m² a. Above the lowest level of fire department vehicle access</p>	HEIGHT OF BUILDING ^a	SFRM MINIMUM BOND STRENGTH	More than 75 feet and up to 420 feet	430 psf	More than 420 feet	1,000 psf	2007
HEIGHT OF BUILDING ^a	SFRM MINIMUM BOND STRENGTH								
More than 75 feet and up to 420 feet	430 psf								
More than 420 feet	1,000 psf								
Deleted	405.7	<p>Delete without substitution:</p> <p>[F] 405.7 Public address. A public address system shall be provided where required by Section 907.2.19.1.</p>	2008						
407.2.1	407.2.1	<p>407.2.1 Spaces of unlimited area. Waiting areas and similar spaces constructed as required for corridors shall be permitted to be open to a corridor, only where all of the following criteria are met:</p> <ol style="list-style-type: none"> 1. The spaces are not occupied for patient sleeping units, treatment rooms, hazardous or incidental accessory occupancies uses in accordance with Section 508.2. 2. The open space is protected by an automatic fire detection system installed in accordance with Section 907. 3. The corridors onto which the spaces open, in the same smoke compartment, are protected by an automatic fire detection system installed in accordance with Section 907, or the smoke compartment in which the spaces are located is equipped throughout with quick-response sprinklers in accordance with Section 903.3.2. 4. The space is arranged so as not to obstruct access to the required exits. 	2007						
407.2.3	407.2.3	<p>407.2.3 Mental health treatment areas. Areas wherein mental health patients who are not capable of self-preservation are housed, or group meeting or multipurpose therapeutic spaces other than incidental accessory occupancies uses in accordance with Section 508.2, under continuous supervision by facility staff, shall be permitted to be open to the corridor, where the following criteria are met:</p> <ol style="list-style-type: none"> 1. Each area does not exceed 1,500 square feet (140 m²). 2. The area is located to permit supervision by the facility staff. 3. The area is arranged so as not to obstruct any access to the required exits. 4. The area is equipped with an automatic fire detection system installed in accordance with Section 907.2. 5. Not more than one such space is permitted in any one smoke compartment. 6. The walls and ceilings of the space are constructed as required for corridors. 	2007						
408.3.7 (New)		<p>408.3.7 Guard tower doors. A hatch or trap door not less than 16 square feet (610 m²) in area through the floor and having minimum dimensions of not less than 2 feet (610 mm) in any direction shall be permitted to be used as a portion of the means of egress from to access guard towers.</p>	2008						

2009 SECTION	2006 SECTION	DESCRIPTION OF REVISION	CCC REF YEAR
408.4	408.4	408.4 Locks. Egress doors are permitted to be locked in accordance with the applicable use condition. Doors from an area of refuge area to the exterior are permitted to be locked with a key in lieu of locking methods described in Section 408.4.1. The keys to unlock the exterior doors shall be available at all times and the locks shall be operable from both sides of the door.	2006
408.5.1 (New) 408.5.2 (New)		<p>408.5.1 Floor openings. Openings in floors within a housing unit are permitted without enclosure protection a <u>shaft enclosure</u>, provided all the following conditions are met:</p> <ol style="list-style-type: none"> 1. The entire normally occupied areas so interconnected are open and unobstructed so as to enable observation of the areas by supervisory personnel; 2. Means of egress capacity is sufficient for all occupants from all interconnected cell tiers and areas; 3. The height difference between the floor levels of the highest and lowest cell tiers shall not exceed 23 feet (7010 mm); and 4. Egress from any portion of the cell tier to an exit or exit access door shall not require travel on more than one additional floor level within the housing unit. <p>408.5.2 Shaft openings in communicating floor levels. Where a floor opening is permitted between communicating floor levels of residential a housing unit in accordance with Section 408.5.1, plumbing chases serving vertically stacked individual cells contained with the area housing unit shall be permitted without a <u>shaft enclosure</u>.</p>	2008
410.5.3	410.5.3	410.5.3 Stage exits. At least one approved means of egress shall be provided from each side of the stage and from each side of the space under the stage. At least one means of escape shall be provided from each fly gallery and from the gridiron. A steel ladder, alternating tread stairway device or spiral stairway is permitted to be provided from the gridiron to a scuttle in the stage roof.	2007
412.2 (New)	412.3.1 412.5.1	<p>412.2 Definitions. The following words and terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meaning shown herein.</p> <p>FIXED BASE OPERATOR (FBO). A commercial business granted the right by the airport sponsor to operate on an airport and provide aeronautical services such as fueling, hangaring, tie-down and parking, aircraft rental, aircraft maintenance and flight instruction.</p> <p>HELIPORT. An area of land or water or a structural surface that is used, or intended for use, for the landing and taking off of helicopters, and any appurtenant areas that are used, or intended for use, for heliport buildings or other heliport facilities.</p> <p>HELISTOP. The same as "Heliport," except that no fueling, defueling, maintenance, repairs or storage of helicopters is permitted.</p> <p>RESIDENTIAL AIRCRAFT HANGAR. An accessory building less than 2,000 square feet (186 m²) and 20 feet (6096 mm) in building height constructed on a one- or two-family property where aircraft are stored. Such use will be considered as a residential accessory use incidental to the dwelling.</p> <p>TRANSIENT AIRCRAFT. Aircraft based at another location and at the transient location for not more than 90 days.</p>	2008
414.1.3	414.1.3	<p>[F] 414.1.3 [Supp] Information required. <u>A report shall be submitted to the building official identifying the maximum expected quantities of hazardous materials to be stored, used in a closed system and used in an open system, and subdivided to separately address hazardous materials classification categories based on Tables 307.1(1) and 307.1(2). The methods of protection from such hazards, including but not limited to control areas, fire protection systems and Group H occupancies shall be indicated in the report and on the construction documents. The opinion and report shall be prepared by a qualified person, firm or corporation approved by the building official and shall be provided without charge to the enforcing agency.</u></p> <p>For buildings and structures with an occupancy in Group H, separate floor plans shall be submitted identifying the locations of anticipated contents and processes so as to reflect the nature of each occupied portion of every building and structure. A report shall be submitted to the code official identifying the maximum expected quantities of hazardous materials to be stored, used in a closed system and used in an open system, and subdivided to separately address hazardous materials classification categories based on Tables 307.1(1) and 307.1(2). The methods of protection from such hazards, including but not limited to control areas, fire protection systems and Group H occupancies shall be indicated in the report and on the construction documents. The opinion and report shall be prepared by a qualified person, firm or corporation approved by the building official and shall be provided without charge to the enforcing agency.</p>	2007

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2009 SECTION	2006 SECTION	DESCRIPTION OF REVISION	CCC REF YEAR
419.3.1	419.3.1	419.3.1 (Supp) Egress capacity. The egress capacity for each element of the live/work unit shall be based on the occupancy <u>occupant</u> load for the occupancy <u>function</u> served in accordance with Table 1004.1.1.	2008
509.8	509.8	<p>509.8 Group B or M with Group S-2 open parking garage. Group B or M occupancies located no higher than the first story above grade plane <u>and located below a Group S-2 open parking garage</u> shall be considered as a separate and distinct building for the purpose of determining the type of construction where all of the following conditions are met:</p> <ol style="list-style-type: none"> 1. The buildings are separated with a horizontal assembly having a minimum 2-hour fire-resistance rating. 2. The occupancies in the building below the horizontal assembly are limited to Groups B and M. 3. The occupancy above the horizontal assembly is limited to a Group S-2 open parking garage. 4. The building below the horizontal assembly is of Type I or II construction but not less than the type of construction required for the Group S-2 open parking garage above. 5. The height and area of the building below the horizontal assembly does not exceed the limits set forth in Section 503. 6. The height and area of the Group S-2 open parking garage does not exceed the limits set forth in Section 406.3. The height, in both feet and stories, of the Group S-2 open parking garage shall be measured from grade plane and shall include the building below the horizontal assembly. 7. Exits serving the Group S-2 open parking garage discharge directly to a street or public way and are separated from the building below the horizontal assembly by 2-hour fire barriers constructed in accordance with Section 706 or 2-hour horizontal assemblies constructed in accordance with Section 711, or both. 	2008
702.1	702.1	<p style="text-align: center;">SECTION 702 DEFINITIONS</p> <p>702.1 Definitions. The following words and terms shall, for the purposes of this chapter, and as used elsewhere in this code, have the meanings shown herein.</p> <p>SELF-CLOSING. As applied to a fire door or other opening <u>protective</u>, means equipped with an approved device that will ensure closing after having been opened.</p>	2008
708.2	707.2	<p>707.2 Shaft enclosure required. Openings through a floor/ceiling assembly shall be protected by a shaft enclosure complying with this Section.</p> <p>Exceptions:</p> <ol style="list-style-type: none"> 1. through 3. (No change) 4. A shaft enclosure is not required for penetrations by ducts protected in accordance with <u>Section 716.6, Section 712.4.</u> Grease ducts shall be protected in accordance with the <i>International Mechanical Code</i>. 5. (No change) 6. A shaft enclosure is not required for approved masonry chimneys where the annular space protection is provided <u>fireblocked</u> at each floor level in accordance with Section 717.2.5. 7. In other than Groups I-2 and I-3, a shaft enclosure is not required for a floor opening or an air transfer opening that complies with the following: <ol style="list-style-type: none"> 7.1. Does not connect more than two stories. 7.2. Is not part of the required means of egress system, except as permitted in Section 4020.4. 7.3 through 7.7 (No change) 8. through 10 (No change) 11. A shaft enclosure shall not be required for floor openings created by unenclosed stairs or ramps in accordance with Exception <u>3 or 4 in Section 1016.1</u> 8 or 9 in Section 4020.4. 12. (No change) <u>13. In Group I-3 occupancies, a shaft enclosure is not required for floor openings in accordance with Section 408.5.</u> 13,14. (No change) 14,15. A shaft enclosure is not required for elevators in open parking garages that serve only the parking garage are not required to be enclosed. 15,16. (No change) 	2007 2008
707.3.6	706.3.6	706.3.6 Incidental <u>accessory occupancies</u> use areas. The fire barrier separating incidental <u>accessory occupancies</u> uses from other spaces in the building shall have a fire-resistance rating of not less than that indicated in Table 508.2.5.	2007

2009 SECTION	2006 SECTION	DESCRIPTION OF REVISION	CCC REF YEAR				
709.4	708.4	708.4 [Suppl] Continuity. Fire partitions shall extend from the top of the foundation or floor/ceiling assembly below to the underside of the floor or roof sheathing, slab or deck above or to the fire-resistance-rated floor/ceiling or roof/ceiling assembly above, and shall be securely attached thereto. If the partitions are not continuous to the sheathing, deck or slab, and where constructed of combustible construction, the space between the ceiling and the sheathing, deck or slab above shall be fireblocked or draftstopped in accordance with Sections 717.2 and 717.3 at the partition line. The supporting fire-resistance rating of the wall supported, except for walls separating tenant spaces in covered mall buildings, walls separating dwelling units, <u>walls separating sleeping units</u> , and corridor walls, in buildings of Types IIB, IIIB, and VB construction. Exceptions: (No change)	2007				
713.4	712.4	712.4 [Suppl] Horizontal assemblies. Penetrations of a floor, floor/ceiling assembly or the ceiling membrane of a roof/ceiling assembly not required to be enclosed in a shaft by Section 707.2 shall be protected in accordance with Sections 712.4.1 through 712.4.4 712.4.2.2.	2007				
716.5.1.1 716.5.2.1		Revise 716.5.1.1 as follows: "...penetrates a fire wall or fire barrier that serves as..." Revise 716.5.2.1 as follows: "...penetrates a fire wall or fire barrier that serves as..."	2007				
803.1.4	803.1.4	Add the UL 723 reference into both the section title and the section text based upon the intended action of FS11.	2007				
T. 903.2.11.6	T. 903.2.13	[F] TABLE 903.2.13 ADDITIONAL REQUIRED SUPPRESSION SYSTEMS	2007				
		<table border="1"> <thead> <tr> <th>SECTION</th> <th>SUBJECT</th> </tr> </thead> <tbody> <tr> <td>508-2508.2.5</td> <td>Incidental accessory occupancies uses</td> </tr> </tbody> </table>	SECTION	SUBJECT	508-2508.2.5	Incidental accessory occupancies uses	
SECTION	SUBJECT						
508-2508.2.5	Incidental accessory occupancies uses						
907.3 (New)		907.3 Where required – existing buildings. The installation and maintenance of fire alarm systems in existing buildings shall be in accordance with the <i>International Fire Code</i> .	2008				
907.6.2	907.7.2	Section 907.7.2 (Suppl) Revise exception to read as follows: "...as required in Sections 907.2.10.4 and 907.3.4.3. "	2008				
915 (New)		SECTION 913 EMERGENCY RESPONDER RADIO COVERAGE	2008				
		[F] 913.1 General. Emergency responder radio coverage shall be provided in all new buildings in accordance with Section 510 of the <i>International Fire Code</i> .					
1005.1	1005.1	1005.1 (IFC [B] 1005.1) Minimum required egress width. The means of egress width shall not be less than required by this section. The total width of means of egress in inches (mm) shall not be less than the total occupant load served by the means of egress multiplied by <u>0.3 inches (7.62 mm) per occupant for stairways, and by 0.2 inches (5.08 mm) per occupant for other egress components.</u> the factors in Table 1005.1 and The width shall not be less than specified elsewhere in this code. Multiple means of egress shall be sized such that the loss of any one means of egress shall not reduce the available capacity to less than 50 percent of the required capacity. The maximum capacity required from any story of a building shall be maintained to the termination of the means of egress. Exception: Means of egress complying with Section 1025.	2008				
1009.11 (New)		1009.11 Ships ladders. Ship ladders are permitted to be used in <u>Group I-3</u> as a component of a means of egress to and from control rooms or elevated facility observation stations not more than 250 SF (23sq m) with not more than 3 occupants and for access to unoccupied roofs in Group I-3. Ship ladders shall have a minimum projected tread of 5 inches (127 mm), a minimum tread depth of 8.5 inches (216 mm), a minimum tread width of 15 inches (612 mm) and a maximum riser height of 9.5 inches (241 mm). Handrails shall be provided on both sides of ship ladders.	2008				
1012.3 1012.3.1 1012.3.2	1012.3 1012.3 1012.3	1012.3 Handrail graspability. All Required handrails shall <u>comply with Section 1012.3.1 meet Type I as follows</u> or shall provide equivalent graspability. Exception: In Group R-3 occupancies; within dwelling units in Group R-2 occupancies; and in Group U occupancies that are accessory to a Group R-3 occupancy or accessory to individual dwelling units in Group R-2 occupancies; handrails shall comply with Section 1012.3.1 or 1012.3.2 or shall provide equivalent graspability.	2007				

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		<p>1012.3.1 Type I. Handrails with a circular cross-section shall have an outside diameter of at least 1.25 inches (32 mm) and not greater than 2 inches (51 mm). If the handrail is not circular, it shall have a perimeter dimension of at least 4 inches (102 mm) and not greater than 6.25 inches (160 mm) with a maximum cross-section dimension of 2.25 inches (57 mm). Edges shall have a minimum radius of 0.01 inch (0.25 mm).</p> <p>Exception: In Group R-3 occupancies; within dwelling units in Group R-2 occupancies; and in Group U occupancies that are accessory to a Group R-3 occupancy or accessory to individual dwelling units in Group R-2 occupancies; handrails shall be Type I, Type II as follows or shall provide equivalent graspability.</p> <p>1012.3.2 Type II. Handrails with a perimeter greater than 6.25 inches (160 mm) shall provide a graspable finger recess area on both sides of the profile. The finger recess shall begin within a distance of 0.75 inch (19 mm) measured vertically from the tallest portion of the profile and achieve a depth of at least .3125 inch (8 mm) within 0.875 inch (22 mm) below the widest portion of the profile. This required depth shall continue for at least 0.375 inch (10mm) to a level that is not less than 1.75 inches (45 mm) below the tallest portion of the profile. The minimum width of the handrail above the recess shall be 1.25 inches (32 mm) to a maximum of 2.75 inches (70 mm). Edges shall have a minimum radius of 0.01 inch (0.25 mm).</p>	
1012.6	1012.5	<p>1012.5 Handrail extensions. Handrails shall return to a wall, guard or the walking surface or shall be continuous to the handrail of an adjacent stair flight. Where handrails are not continuous between flights the handrails shall extend horizontally at least 12 inches (305 mm) beyond the top riser and continue to slope for the depth of one tread beyond the bottom riser. At ramps where handrails are not continuous between runs, the handrail shall extend horizontally above the landing 12 inches (305 mm) minimum beyond the top and bottom of ramp runs.</p> <p>Exceptions:</p> <ol style="list-style-type: none"> 1. Handrails within a dwelling unit that is not required to be accessible need extend only from the top riser to the bottom riser. 2. Aisle handrails in Group A and E occupancies in accordance with Section 1025.13. 3. Handrails for alternating tread devices may <u>are permitted to</u> terminate at a location vertically above the top and bottom risers. Handrails for alternating tread devices are not required to be continuous between flights or to extend beyond the top or bottom risers. 	2007
1018.2 1018.3	1017.3	<p>1017.2 Corridor width. The minimum corridor width shall be as determined in Section 1005.1, but not less than 44 inches (1118 mm).</p> <p>Exceptions:</p> <ol style="list-style-type: none"> 1. Twenty-four inches (610 mm)—For access to and utilization of electrical, mechanical or plumbing systems or equipment. 2. Thirty-six inches (914 mm)—With a required occupant capacity of less than 50. 3. Thirty-six inches (914 mm)—Within a dwelling unit. 4. Seventy-two inches (1829 mm)—In Group E with a corridor having a required capacity of 100 or more. 5. Seventy-two inches (1829 mm)—In corridors serving surgical Group I, health care centers for ambulatory patients receiving outpatient medical care, which causes the patient to be not capable of self-preservation 6. Ninety-six inches (2438 mm)—In Group I-2 in areas where required for bed movement. <p>1017.3 Corridor obstruction. The required width of corridors shall be unobstructed.</p> <p>Exception: Doors complying with Section 1005.2.</p>	2007
1022	1020	<p>SECTION 1020 VERTICAL EXIT ENCLOSURE</p>	2007
1023.5	1021.4	<p>1021.4 Openings and penetrations. Exit passageway opening protectives shall be in accordance with the requirements of Section 715.</p> <p>Except as permitted in Section 402.4.6, openings in exit passageways other than unexposed unprotected exterior openings shall be limited to those necessary for exit access to the exit passageway from normally occupied spaces and for egress from the exit passageway.</p> <p>Where an exit enclosures is extended to an exit discharge or a public way by an exit passageway, the exit passageway shall also comply with Section 1020.2.1.</p> <p>Elevators shall not open into an exit passageway.</p>	2008

2009 SECTION	2006 SECTION	DESCRIPTION OF REVISION	CCC REF YEAR
1022.4	1020.1.2	<p>1020.1.2 Penetrations. Penetrations into and openings through an exit enclosure are prohibited except for required exit doors, equipment and ductwork necessary for independent <u>ventilation or</u> pressurization, sprinkler piping, standpipes, electrical raceway for fire department communication systems and electrical raceway serving the exit enclosure and terminating at a steel box not exceeding 16 square inches (0.010 m²). Such penetrations shall be protected in accordance with Section 712. There shall be no penetrations or communication openings, whether protected or not, between adjacent exit enclosures.</p>	2007
1109.2.3 (New)		<p>1109.2.3 Lavatories. Where lavatories are provided, at least 5 percent, but not less than one shall be accessible. Where the total lavatories provided in a toilet room or bathing facility <u>room</u> is six or more, at least one lavatory with enhanced reach ranges in accordance with ICC A117.1, shall be provided.</p>	2008
1406.2.2 1406.2.4 1406.3	1406.2.2 1406.2.4 1406.3	<p>1406.2.2 Architectural trim. In buildings of Type I, II, III and IV construction, exterior wall coverings shall be permitted to be constructed of wood where permitted by Section 1405.4 or other equivalent combustible material. Combustible exterior wall coverings, other than fire-retardant-treated wood complying with Section 2303.2 for exterior installation, shall not exceed 10 percent of an exterior wall surface area where the fire separation distance is 5 feet (1524 mm) or less. Combustible architectural trim shall be limited to three stories or 40 feet (12 192 mm) above grade plane. Noncombustible materials shall be permitted to be of any height provided the materials are secured to the wall with metal or other approved noncombustible brackets.</p> <p>Exception: Combustible architectural trim of fire-retardant treated wood shall be permitted up to four stories or 60 feet in height above grade plane.</p> <p>1406.2.4 Fireblocking. Where the combustible exterior wall covering is furred from the wall and forms a solid surface, the distance between the back of the covering and the wall shall not exceed 1.625 inches (41 mm). Where required by Section 717, the space thereby created shall be fireblocked.</p> <p>1406.3 Balconies and similar projections. Balconies and similar projections of combustible construction other than fire-retardant-treated wood shall be fire-resistance rated in accordance with Table 601 for floor construction or shall be of Type IV construction in accordance with Section 602.4. The aggregate length shall not exceed 50 percent of the building-s perimeter on each floor.</p> <p>Exceptions:</p> <ol style="list-style-type: none"> 1. On buildings of Type I and II construction, three stories or less above grade plane, fire-retardant treated wood shall be permitted for balconies, porches, decks and exterior stairways not used as required exits. 2. Untreated wood is permitted for pickets and rails or similar guardrail devices that are limited to 42 inches (1067 mm) in height. 3. Balconies and similar projections on buildings of Type III, IV and V construction shall be permitted to be of Type V construction, and shall not be required to have a fire-resistance rating where sprinkler protection is extended to these areas. 4. Where sprinkler protection is extended to the balcony areas, the aggregate length of the balcony on each floor shall not be limited. 	2007
Deleted	T. 1504.2.1	<p>TABLE 1504.2.1 ROOF COVERING CLASSIFICATION USING ALTERNATIVE METHOD</p>	2008
1509.2.4	1509.2.1	<p>1509.2.1 Type of construction. Penthouses shall be constructed with walls, floors and roof as required for the building.</p> <p>Exceptions:</p> <ol style="list-style-type: none"> 1. On buildings of Type I construction, the exterior walls and roofs of penthouses with a fire separation distance of more than 5 feet (1524 mm) and less than 20 feet (6096 mm) shall be of at least 1-hour fire-resistance-rated noncombustible construction. Walls and roofs with a fire separation distance of 20 feet (6096 mm) or greater shall be of noncombustible construction. Interior framing and walls shall be of noncombustible construction. 2. On buildings of Type I <u>construction</u> two stories above grade plane or less in height and Type II construction, the exterior walls and roofs of penthouses with a fire separation distance of more than 5 feet (1524 mm) and less than 20 feet (6096 mm) shall be of at least 1-hour fire-resistance-rated noncombustible or fire-retardant-treated wood construction. Walls and roofs with a fire separation distance of 20 feet (6096 mm) or greater shall be of noncombustible or fire-retardant-treated wood construction. Interior framing and walls shall be of noncombustible or fire-retardant-treated wood construction. 	2007

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		<ol style="list-style-type: none"> 3. On buildings of Type III, IV and V construction, the exterior walls of penthouses with a fire separation distance of more than 5 feet (1524 mm) and less than 20 feet (6096 mm) shall be at least 1-hour fire-resistance-rated construction. Walls with a fire separation distance of 20 feet (6096 mm) or greater from a common property line shall be of Type IV <u>construction</u>, or noncombustible or fire-retardant-treated wood construction. Roofs shall be constructed of materials and fire-resistance rated as required in Table 601 and Section 601, Item 1.3. Interior framing and walls shall be Type IV <u>construction</u>, or noncombustible or fire-retardant-treated wood construction. 4. On buildings of Type I <u>construction</u>, unprotected noncombustible enclosures housing only mechanical equipment and located with a minimum fire separation distance of 20 feet (6096 mm) shall be permitted. 5. On buildings of Type I <u>construction</u> two stories or less above grade plane in height, or Type II, III, IV, and V <u>construction</u>, unprotected noncombustible or fire retardant-treated wood enclosures housing only mechanical equipment and located with a minimum fire separation distance of 20 feet (6096 mm) shall be permitted. 6. On one-story buildings, combustible unroofed mechanical equipment screens, fences or similar enclosures are permitted where located with a fire separation distance of at least 20 feet (6096 mm) from adjacent property lines and where not exceeding 4 feet (1219 mm) in height above the roof surface. 7. Dormers shall be of the same type of construction as the roof on which they are placed, or of the exterior walls of the building. 	
1602	1602	<p>E_m — Maximum seismic load effect of horizontal and vertical seismic forces as set forth in Section 12.4.3 of ASCE 7.</p>	2007
1604.10	1604.10	<p>1604.10 Wind and seismic detailing. Lateral-force-resisting systems shall meet seismic detailing requirements and limitations prescribed in this code and ASCE 7, excluding Chapter 14 and Appendix 11A, even when wind code prescribed load effects are greater than seismic load effects.</p>	2006
1605.4	1605.5	<p>1605.5 Heliports and helistops. Heliport and helistop landing areas shall be designed for the following loads, combined in accordance with Section 1605:</p> <ol style="list-style-type: none"> 1. Dead load, D, plus the gross weight of the helicopter, D_h, plus snow load, S. 2. Dead load, D, plus two single concentrated impact loads, L, approximately 8 feet (2438 mm) apart applied anywhere on the touchdown pad (representing each of the helicopter's two main landing gear, whether skid type or wheeled type), having a magnitude of 0.75 times the gross weight of the helicopter. Both loads acting together total 1.5 times the gross weight of the helicopter. 3. Dead load, D, plus a uniform live load, L, of 100 psf (4.79 kN/m²). <p>Exception: Landing areas designed for helicopters with gross weights not exceeding 3,000 pounds (13.34 kN) in accordance with Items 1 and 2 shall be permitted to be designed using a 40 psf (1.92 kN/m²) uniform live load in Item 3, provided the landing area is identified with a 3,000 pound (13.34 kN) weight limitation. This 40 psf (1.92 kN/m²) uniform live load shall not be reduced. The landing area weight limitation shall be indicated by the numeral "3" (kips) located in the bottom right corner of the landing area as viewed from the primary approach path. The <u>indication for the</u> landing area weight limitation shall be a minimum 5 feet (1524 mm) in height.</p>	2006
1613.5.6	1613.5.6	<p>1613.5.6 Determination of seismic design category. Structures classified as Occupancy Category I, II or III structures that are located where the mapped spectral response acceleration parameter at 1-second period, S_1, is greater than or equal to 0.75 shall be assigned to Seismic Design Category E. Structures classified as Occupancy Category IV structures that are located where the mapped spectral response acceleration parameter at 1-second period, S_1, is greater than or equal to 0.75 shall be assigned to Seismic Design Category F. All other structures shall be assigned to a seismic design category based on their occupancy category and the design spectral response acceleration coefficients, S_{DS} and S_{D1}, determined in accordance with Section 1613.5.4 or the site specific procedures of ASCE 7. Each building and structure shall be assigned to the more severe seismic design category in accordance with Table 1613.5.6(1) or 1613.5.6(2), irrespective of the fundamental period of vibration of the structure, T.</p> <p>1613.5.6.1 Alternative seismic design category determination. Where S_1 is less than 0.75, the seismic design category is permitted to be determined from Table 1613.5.6(1) alone when all of the following apply:</p> <ol style="list-style-type: none"> 1. In each of the two orthogonal directions, the approximate fundamental period of the structure, T_a, in each of the two orthogonal directions determined in accordance with Section 12.8.2.1 of ASCE 7, is less than $0.8 T_s$ determined in accordance with Section 	2006

2009 SECTION	2006 SECTION	DESCRIPTION OF REVISION	CCC REF YEAR
		<p>11.4.5 of ASCE 7.</p> <p>2. In each of the two orthogonal directions, the fundamental period of the structure used to calculate the story drift is less than T_s.</p> <p>3. Equation 12.8-2 of ASCE 7 is used to determine the seismic response coefficient, C_s.</p> <p>4. The diaphragms are rigid as defined in Section 12.3.1 of ASCE 7 or, for diaphragms that are flexible, the distances between vertical elements of the seismic-force-resisting system does not exceed 40 feet (12 192 mm).</p>	
1704.5	1704.5	<p>1704.5 Masonry construction. Masonry construction shall be inspected and evaluated in accordance with the requirements of Sections 1704.5.1 through 1704.5.3, depending on the classification <u>Occupancy Category</u> of the building or structure or nature of occupancy, as defined by this code.</p> <p>Exceptions: (No change)</p>	2007
1708.3	1708.4	<p>1708.4 Structural steel. The testing contained in the quality assurance plan <u>statement of special inspections</u> shall be as required by AISC Seismic and the additional requirements herein. The acceptance criteria for nondestructive testing shall be as required in AWS D1.1 as specified by the registered design professional.</p> <p>Base metal thicker than 1.5 inches (38 mm), where subject to through-thickness weld shrinkage strains, shall be ultrasonically tested for discontinuities behind and adjacent to such welds after joint completion. Any material discontinuities shall be accepted or rejected on the basis of ASTM A 435 or A 898 (Level 1 Criteria) and criteria as established by the registered design professional(s) in responsible charge and the construction documents.</p>	2007
1810.3.3.1.4 (New)		<p>1810.3.3.1.4 Allowable frictional resistance. The assumed frictional resistance developed by any uncased cast-in-place deep foundation element shall not exceed one-sixth of the bearing value of the soil material at minimum depth as set forth in Table 1806.2, up to a maximum of 500 psf (24 kPa), unless a greater value is allowed by the building official on the basis of a geotechnical investigation as specified in Section 1803 is submitted or a greater value is substantiated by a load test in accordance with Section 1810.3.3.1.2. Frictional resistance and bearing resistance shall not be assumed to act simultaneously unless determined by a geotechnical investigation in accordance with Section 1803.</p>	2008
1902.1	1902.1	<p>1902.1 General. The words and terms defined in ACI 318 shall, for the purposes of this chapter and as used elsewhere in this code for concrete construction, have the meanings shown in ACI 318 <u>as modified by Section 1908.1.1.</u></p>	2008
2209.2 (New)		<p>2209.2 Steel decks. <u>The design and construction of cold-formed steel decks shall be in accordance with this section.</u></p> <p>2209.2.1 Composite slabs on steel decks. Composite slabs of concrete and steel deck shall be designed and constructed in accordance with ASCE 3.</p> <p>2209.2.2 Non-composite steel floor decks. Non-composite steel floor decks shall be permitted to be designed and constructed in accordance with ANSI/SDI-NC1.0, as modified in Section 2209.2.1.1 <u>2209.2.1.</u></p> <p>2209.2.2.1 ANSI/SDI-NC1.0 Section 2.4B1. Replace Section 2.4B1 of ANSI/SDI-NC1.0 with the following:</p> <p>1. General: The design of the concrete slabs shall be done in accordance with the ACI <i>Building Code Requirements for Reinforced Concrete</i>. The minimum concrete thickness above the top of the deck shall be 1-1/2 inches (38 mm).</p> <p>2209.2.3 Steel roof deck. Steel roof decks shall be permitted to be designed and constructed in accordance with ANSI/SDI-RD1.0.</p>	2008
2303.1.3	2303.1.3	<p>2303.1.3 Structural glued-laminated timber. Glued-laminated timbers shall be manufactured and identified as required in ANSI/AITC A190.1 and ASTM D 3737.</p>	2007
2306.1	2306.1	<p>2306.1 Allowable stress design. American Institute of Timber Construction. ANSI/AITC A190.1 Structural Glued Laminated Timber</p>	2007
2406.3.1	2406.2.1	<p>2406.2.1 2406.3.1 Multilight Multipane assemblies. Multilight Multipane glazed assemblies having individual lights <u>panes</u> not exceeding 1 square foot (0.09 m²) in exposed areas shall have at least one light pane <u>pane</u> in the assembly marked as indicated in Section 2406.3. Other lights <u>panes</u> in the assembly shall be marked "CPSC 16 CFR 1201" or "ANSI Z97.1," as appropriate.</p>	2008
2902.3.1 (New)		<p>2902.4.1 [P] 2902.3.1 Access. The route to the public toilet facilities required by Section 2902.3 shall not pass through kitchens, storage rooms or closets. Access to the required facilities shall be from within the building or from the exterior of the building. All routes shall comply with the accessibility requirements of the <i>International Building Code</i>. The public shall have access to</p>	2008

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2009 SECTION	2006 SECTION	DESCRIPTION OF REVISION	CCC REF YEAR
		the required toilet facilities at all times that the building is occupied.	
2902.6.1 (New)		[P] 2902.5.1 2902.6.1 Directional signage. Directional signage indicating the route to the public facilities shall be posted in accordance with Section 3107. Such signage shall be located in a corridor or aisle, at the entrance to the facilities for customers and visitors.	2008
3006.4	3006.4	<p>3006.4 Machine rooms and machinery spaces. Elevator machine rooms and machinery spaces shall be enclosed with fire barriers constructed in accordance with Section 706 or horizontal assemblies constructed in accordance with Section 711, or both. The fire-resistance rating shall not be less than the required rating of the hoistway enclosure served by the machinery. Openings in the fire barriers shall be protected with assemblies having a fire protection rating not less than that required for the hoistway enclosure doors.</p> <p>Exceptions:</p> <ol style="list-style-type: none"> 1. Where machine rooms and machinery spaces do not abut and have no openings to the hoistway enclosure they serve the fire barriers constructed in accordance with Section 706 or horizontal assemblies constructed in accordance with Section 711, <u>or both</u>, shall be permitted to be reduced to a 1-hour fire-resistance rating. 2. In buildings 4 stories or less, above grade plane when machine room and machinery spaces do not abut and have no openings to the hoistway enclosure they serve, the machine room and machinery spaces need not be rated <u>are not required to be fire-resistance rated</u>. 	2007
3401.4.1 (New)		3401.4.1 Existing materials. Materials already in use in a building in conformance with requirements or approvals in effect at the time of their erection or installation shall be permitted to remain in use unless determined by the code official to be detrimental <u>dangerous</u> to life, health or safety. Where such conditions are determined to be dangerous to life, health or safety, they shall be mitigated or made safe.	2008
3403.2 (New)		<p>3403.2 Flood hazard areas. For buildings and structures in flood hazard areas established in Section 1612.3, any addition that constitutes substantial improvement of the existing structure, as defined in Section 1612.2, shall comply with the flood design requirements for new construction, and all aspects of the existing structure shall be brought into compliance with the requirements for new construction for flood design.</p> <p><u>For buildings and structures in flood hazard areas established in Section 1612.3, any additions that do not constitute substantial improvement or substantial damage of the existing structure, as defined in Section 1612.2, are not required to comply with the flood design requirements for new construction.</u></p>	2008
3403.4.1 (New) 3404.4.1 (New)		<p>3403.4 Existing structural elements carrying lateral load. (No change)</p> <p>3403.4.1 Seismic. <u>Seismic requirements for additions shall be in accordance with this section. Values of R, Ω_o, and C_d for the existing seismic force-resisting system shall be those specified by this code for an Ordinary system unless it is demonstrated that the existing system will provide performance equivalent to that of an Intermediate or Special system.</u></p> <p>3404.4 Existing structural elements carrying lateral load. (No change)</p> <p>3404.4.1 Seismic. <u>Seismic requirements for alterations shall be in accordance with this section. Values of R, Ω_o, and C_d for the existing seismic force-resisting system shall be those specified by this code for an Ordinary system unless it is demonstrated that the existing system will provide performance equivalent to that of an Intermediate or Special system.</u></p>	2008
3404.5 (New)		<p>3404.5 Voluntary seismic improvements. Alterations to existing structural elements or additions of new structural elements that are not otherwise required by this chapter and are initiated for the purpose of improving the performance of the seismic force-resisting system of an existing structure or the performance of seismic bracing or anchorage of existing nonstructural elements shall be permitted, provided that an engineering analysis is submitted demonstrating the following:</p> <ol style="list-style-type: none"> 1. The design strength of existing structural elements required to resist seismic forces is not reduced. The altered structure and the altered non structural elements are no less conforming with the provisions of this code with respect to earthquake design than they were prior to the alteration. 2. The seismic force to required existing structural elements is not increased beyond their design strength. 	2008

2009 SECTION	2006 SECTION	DESCRIPTION OF REVISION	CCC REF YEAR
		<p>3- 2. New structural elements are detailed and connected to the existing structural elements as required by Chapter 16.</p> <p>4- 3. New or relocated nonstructural elements are detailed and connected to existing or new structural elements as required by Chapter 16.</p> <p>5- 4. The alterations do not create a structural irregularity as defined in ASCE 7 or make an existing structural irregularity more severe.</p> <p>6- The alterations do not result in the creation of an unsafe condition.</p>	
3405		<p>3405.1 General. Buildings and structures, and parts thereof, shall be repaired in conformance with Section 3401.2. Work on non-damaged components that is necessary for the required repair of damaged components shall be considered part of the repair and shall not be subject to the requirements for alterations in this chapter. <u>Routine maintenance required by section 3401.2, ordinary repairs exempt from permit per Section 105.2, and abatement of wear due to normal service conditions shall not be subject to the requirements for repairs in this section.</u></p> <p>3405.1.1 Dangerous conditions. <u>Regardless of the extent of structural or nonstructural damage, the code official shall have the authority to require the elimination of conditions deemed dangerous.</u></p> <p>3405.2 Substantial structural damage to vertical elements of the lateral-force-resisting system. <u>A building that has sustained substantial structural damage to the vertical elements of its lateral-force-resisting system shall be evaluated and repaired in accordance with the applicable provisions of Sections 3404.2.1 through 3404.2.3.</u></p> <p>3405.2.1 Evaluation. <u>The building shall be evaluated by a registered design professional, and the evaluation findings shall be submitted to the code official. The evaluation shall establish whether the damaged building, if repaired to its pre-damage state, would comply with the provisions of this code for wind and earthquake loads. Evaluation for earthquake loads shall be required if the substantial structural damage was caused by or related to earthquake effects or if the building is in Seismic Design Category C, D, E, or F.</u> <u>Wind loads for this evaluation shall be those prescribed in Section 1609. Earthquake loads for this evaluation, if required, shall be permitted to be seventy-five percent of those prescribed in Section 1613. Values of R, Ω_0, and C_d for the existing seismic force-resisting system shall be those specified by this code for an Ordinary system unless it is demonstrated that the existing system will provide performance equivalent to that of an Intermediate or Special system.</u></p> <p>3405.2.2 Extent of repair for compliant buildings. <u>If the evaluation establishes compliance of the pre-damage building in accordance with Section 3404.2.1, then repairs shall be permitted that restore the building to its pre-damage state using materials and strengths that existed prior to the damage.</u></p> <p>3405.2.3 Extent of repair for noncompliant buildings. <u>If the evaluation does not establish compliance of the pre-damage building in accordance with Section 3404.2.1, then the building shall be rehabilitated to comply with applicable provisions of this code for load combinations, including wind or seismic loads. The wind loads for the repair shall be as required by the building code in effect at the time of original construction, unless the damage was caused by wind, in which case the wind loads shall be as required by the code in effect at the time of original construction or as required by this code, whichever are greater. Earthquake loads for this rehabilitation design shall be those required for the design of the pre-damage building, but not less than seventy-five percent of those prescribed in Section 1613. New structural members and connections required by this rehabilitation design shall comply with the detailing provisions of this code for new buildings of similar structure, purpose and location.</u></p> <p>3404.3 Substantial structural damage to gravity load-carrying components. <u>Gravity load-carrying components that have sustained substantial structural damage shall be rehabilitated to comply with the applicable provisions of this code for dead and live loads. Snow loads shall be considered if the substantial structural damage was caused by or related to snow load effects. Existing gravity load-carrying structural elements shall be permitted to be designed for live loads approved prior to the damage. Non-damaged gravity load-carrying components that receive dead, live, or snow loads from rehabilitated components shall also be rehabilitated or shown to have the capacity to carry the design loads of the rehabilitation design. New structural members and connections required by this rehabilitation design shall comply with the detailing provisions of this code for new buildings of similar structure, purpose and location.</u></p> <p>3405.3.1 Lateral force-resisting elements. <u>Regardless of the level of damage to vertical elements of the lateral force-resisting system, if substantial structural damage to gravity load-carrying components was caused primarily by wind or earthquake effects, then the building shall be evaluated in accordance with Section 3404.2.1 and, if noncompliant, rehabilitated in accordance with Section 3404.2.3.</u></p> <p>3405.4 Less than substantial structural damage. <u>For damage less than substantial structural damage, repairs shall be allowed that restore the building to its pre-damage state using materials and strengths that existed prior to the damage. New structural members and</u></p>	2008

CODE CHANGES RESOURCE COLLECTION – INTERNATIONAL BUILDING CODE

2009 SECTION	2006 SECTION	DESCRIPTION OF REVISION	CCC REF YEAR																				
		<p><u>connections used for this repair shall comply with the detailing provisions of this code for new buildings of similar structure, purpose and location.</u></p> <p>3404.5 Flood hazard areas. For buildings and structures in flood hazard areas established in Section 1612.3, any repair that constitutes substantial improvement of the existing structure, as defined in Section 1612.2, shall comply with the flood design requirements for new construction, and all aspects of the existing structure shall be brought into compliance with the requirements for new construction for flood design.</p> <p>3405.2 3405.5 Flood hazard areas. For buildings and structures in flood hazard areas established in Section 1612.3, any repair that constitutes substantial improvement of the existing structure, as defined in Section 1612.2, shall comply with the flood design requirements for new construction, and all aspects of the existing structure shall be brought into compliance with the requirements for new construction for flood design.</p> <p>For buildings and structures in flood hazard areas established in Section 1612.3, any repairs that do not constitute substantial improvement or substantial damage of the existing structure, as defined in Section 1612.2, are not required to comply with the flood design requirements for new construction.</p> <p>Add new definition as follows:</p> <p><u>SUBSTANTIAL STRUCTURAL DAMAGE.</u> A condition where:</p> <ol style="list-style-type: none"> 1. <u>In any story, the vertical elements of the lateral force-resisting system have suffered damage such that the lateral load-carrying capacity of the structure in any horizontal direction has been reduced by more than 20 percent from its pre-damage condition;</u> <u>or</u> 2. <u>The capacity of any vertical gravity load-carrying component, or any group of such components, that supports more than 30 percent of the total area of the structure's floor(s) and roof(s) has been reduced more than 20 percent from its pre-damage condition and the remaining capacity of such affected elements, with respect to all dead and live loads, is less than 75 percent of that required by this code for new buildings of similar structure, purpose and location.</u> 																					
3412.6.11	3410.6.11	<p>3410.6.11 Means of egress capacity and number. Evaluate the means of egress capacity and the number of exits available to the building occupants. In applying this section, the means of egress are required to conform to Sections 1003 through 1015 and 1017 through 1024 (except that the minimum width required by this section shall be determined solely by the width for the required capacity in accordance with Table 1005.1) ÷ 1003.7, 1004, 1005.1, 1014.2, 1014.3, 1015.2, 1019, 1024.1, 1024.2, 1024.6, 1025.2, 1025.3, 1025.4 and 1026. The number of exits credited is the number that are available to each occupant of the area being evaluated. Existing fire escapes shall be accepted as a component in the means of egress when conforming to Section 3404. Under the categories and occupancies in Table 3410.6.11, determine the appropriate value and enter that value into Table 3410.7 under Safety Parameter 3410.6.11, Means of Egress Capacity, for means of egress and general safety.</p>	2007																				
3412.6.19 T. 3412.6.19	3410.6.18 T. 3410.6.18	<p>3410.6.18 Incidental use. Evaluate the protection of incidental accessory occupancies uses in accordance with Section 508.2.5. Do not include those where this code requires suppression throughout the building including covered mall buildings, high-rise buildings, public garages and unlimited area buildings. Assign the lowest score from Table 3410.6.18 for the building or fire area being evaluated. If there are no specific occupancy areas in the building or fire area being evaluated, the value shall be zero.</p> <p style="text-align: center;">TABLE 3410.6.18 (IEBC TABLE 1301.6.19) INCIDENTAL <u>ACCESSORY OCCUPANCY USES</u> VALUES^a</p>	2007																				
T. 3412.7	T. 3410.7	<p style="text-align: center;">TABLE 3410.7 (IEBC [B]TABLE 1301.7)</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;">Safety Parameters</th> <th style="text-align: center;">Fire Safety (FS)</th> <th style="text-align: center;">Means of Egress (ME)</th> <th style="text-align: center;">General Safety (GS)</th> </tr> </thead> <tbody> <tr> <td>3410.6.16 Mixed occupancies</td> <td></td> <td style="text-align: center;">****</td> <td></td> </tr> <tr> <td>3410.6.17 Automatic Sprinklers</td> <td></td> <td style="text-align: center;">÷2 =</td> <td></td> </tr> <tr> <td>3410.6.18 Standpipes</td> <td></td> <td></td> <td></td> </tr> <tr> <td>3410.6.19 Incidental Use-Accessory Occupancy</td> <td></td> <td></td> <td></td> </tr> </tbody> </table> <p>(Portions of table not shown remain unchanged)</p>	Safety Parameters	Fire Safety (FS)	Means of Egress (ME)	General Safety (GS)	3410.6.16 Mixed occupancies		****		3410.6.17 Automatic Sprinklers		÷2 =		3410.6.18 Standpipes				3410.6.19 Incidental Use-Accessory Occupancy				2007
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CODE CORRELATION COMMITTEE ACTIONS – International Code Council Electrical Code – Administrative Provisions

The International Code Council no longer produces an *International Code Council Electrical Code – Administrative Provisions*. As a result, in July of 2008 the Code Correlation Committee (CCC) took the following action, in all ICC codes, on sections that referenced that code:

INTERNATIONAL BUILDING CODE																																
DELETED SECTIONS	SECTIONS REPLACING “ICC ELECTRICAL CODE” WITH “NFPA 70” OR “THIS CODE” OR DELETING “ICC ELECTRICAL CODE”	SECTIONS REVISED																														
101.4.1	<table border="0"> <tr> <td><u>2006 Section</u></td> <td><u>2009 Section</u></td> </tr> <tr> <td>107.3</td> <td>108.3</td> </tr> <tr> <td>[F] 415.8.2.8.1</td> <td>Same</td> </tr> <tr> <td>603.1.3</td> <td>Same</td> </tr> <tr> <td>904.3.1</td> <td>Same</td> </tr> <tr> <td>[F] 907.7.1</td> <td>[F] 907.6.1</td> </tr> <tr> <td>[F] 909.11</td> <td>Same</td> </tr> <tr> <td>[F] 909.12.1</td> <td>Same</td> </tr> <tr> <td>[F] 909.16.3</td> <td>Same</td> </tr> <tr> <td>1205.4.1</td> <td>Same</td> </tr> <tr> <td>1405.10.4</td> <td>1405.11.4</td> </tr> <tr> <td>A101.2</td> <td>Same</td> </tr> <tr> <td>G901.6</td> <td>Same</td> </tr> <tr> <td>H106.1</td> <td>Same</td> </tr> <tr> <td>H106.2</td> <td>Same</td> </tr> </table>	<u>2006 Section</u>	<u>2009 Section</u>	107.3	108.3	[F] 415.8.2.8.1	Same	603.1.3	Same	904.3.1	Same	[F] 907.7.1	[F] 907.6.1	[F] 909.11	Same	[F] 909.12.1	Same	[F] 909.16.3	Same	1205.4.1	Same	1405.10.4	1405.11.4	A101.2	Same	G901.6	Same	H106.1	Same	H106.2	Same	<p>(SUPP) [F] 414.5.4 Standby or emergency power. Where mechanical ventilation, treatment systems, temperature control, alarm, detection or other electrically operated systems are required, such systems shall be provided with an emergency or standby power system in accordance with <u>Chapter 27 of this code and the International Code Council Electrical Code Administrative Provisions and Section 604 of the International Fire Code.</u></p> <p>2701.1 Scope. This chapter governs the electrical components, equipment and systems used in buildings and structures covered by this code. Electrical components, equipment and systems shall be designed and constructed in accordance with the provisions of the ICC Electrical Code <u>this code, the International Fire Code, and NFPA 70.</u></p> <p>3401.3 Compliance with other codes. Alterations, repairs, additions and changes of occupancy to existing structures shall comply with the provisions for alterations, repairs, additions and changes of occupancy in the <i>International Fire Code, International Fuel Gas Code, International Mechanical Code, International Plumbing Code, International Property Maintenance Code, International Private Sewage Disposal Code, and International Residential Code</i> and NFPA 70, and ICC Electrical Code.</p>
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Identified electrical hazards shall be abated. Identified hazardous electrical conditions in permanent wiring shall be brought to the attention of the <u>responsible code official responsible for enforcement of the ICC Electrical Code NFPA 70.</u> Electrical wiring, devices, appliances and other equipment that is modified or damaged and constitutes an electrical shock or fire hazard shall not be used.</p> <p>(SUPP) 909.11 Power systems. The smoke control system shall be supplied with two sources of power. Primary power shall be the normal building power systems. Secondary power shall be from an approved standby source complying with <u>Chapter 27 of the International Building Code</u> the International Code Council <i>Electrical Code Administrative Provisions</i>. The standby power source and its transfer switches shall be in a room separate from the normal power transformers and switch gear and ventilated directly to and from the exterior. The room shall be enclosed with not less than 1-hour fire barriers constructed in accordance with Section 706 of the <i>International Building Code</i> or horizontal assemblies constructed in accordance with Section 711 of the <i>International Building Code</i>, or both. Power distribution from the two sources shall be by independent routes. Transfer to full standby power shall be automatic and within 60 seconds of failure of the primary power. The systems shall comply with this code or the International Code Council <i>Electrical Code Administrative Provisions</i>.</p> <p>(SUPP) 2403.12.6.1 Exit sign illumination. (No change)</p> <ol style="list-style-type: none"> 1. (No change) 2. Two separate sources of power, one of which shall be an approved emergency system, shall be provided when the occupant load exceeds 300. Emergency systems shall be supplied from storage batteries or from the on-site generator set, and the system shall be installed in accordance with the International Code Council <i>Electrical Code Administrative Provisions</i> Section 604 and NFPA 70. The emergency system provided shall have a minimum duration of 90 minutes when operated at full design demand. <p>(Same section in 2009) 3503.1.5 Electrical. Electrical wiring and equipment shall be installed and maintained in accordance with <u>Section 605 and the ICC Electrical Code NFPA 70.</u></p>
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INTERNATIONAL FUEL GAS CODE			
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	<u>2006 Section</u> 201.3 [M] 306.3.1 [M] 306.4.1 [M] 306.5.2 309.2 [F] 413.9.2.4 [F] 703.6	<u>2009 Section</u> Same Same Same Same Same Same	
INTERNATIONAL MECHANICAL CODE			
	<u>2006 Section</u> 201.3 301.7 306.3.1 306.4.1 306.5.2 511.1.1 [F] 513.12.1 602.2.1.1 1106.3 1106.4	<u>2009 Section</u> Same Same Same Same Same Same Same Same Same	<p>(Same section in 2009) (SUPP) [F] 513.11 Power systems. The smoke control system shall be supplied with two sources of power. Primary power shall be the normal building power systems. Secondary power shall be from an approved standby source complying with the International Code Council Electrical Code Administrative Provisions Chapter 27 of the <i>International Building Code</i>. The standby power source and its transfer switches shall be in a room separate from the normal power transformers and switch gear and ventilated directly to and from the exterior. The room shall be enclosed with not less than 1-hour fire-resistance-rated fire barriers constructed in accordance with Section 706 of the <i>International Building Code</i> or horizontal assemblies constructed in accordance with Section 711 of the <i>International Building Code</i>, or both. Power distribution from the two sources shall be by independent routes. Transfer to full standby power shall be automatic and within 60seconds of failure of the primary power. The systems shall comply with the International Code Council Electrical Code Administrative Provisions.</p>
INTERNATIONAL PLUMBING CODE			
	<u>2006 Section</u> 201.3 502.1 504.3 1113.1.3	<u>2009 Section</u> Same Same Same Same	
INTERNATIONAL PROPERTY MAINTENANCE CODE			
	<u>2006 Section</u> 102.3 201.3 604.2	<u>2009 Section</u> Same Same Same	
INTERNATIONAL RESIDENTIAL CODE			
	<u>2006 Section</u> R107.3 G2402.3 (201.3)	<u>2009 Section</u> Same Same	

INTERNATIONAL WILDLAND-URBAN INTERFACE CODE		
DELETED SECTIONS	SECTIONS REPLACING “ICC ELECTRICAL CODE” WITH “NFPA 70” OR “THIS CODE” OR DELETING “ICC ELECTRICAL CODE”	SECTIONS REVISED
		<p>(Same section in 2009) 404.10.3 Standby power. Stationary water supply facilities within the wildland-urban interface area dependent on electrical power to meet adequate water supply demands shall provide standby power systems in accordance with the ICC <i>Electrical Code</i> Chapter 27 of the <i>International Building Code</i>, Section 604 of the <i>International Fire Code</i> and NFPA 70 to ensure that an uninterrupted water supply is maintained. The standby power source shall be capable of providing power for a minimum of two hours.</p> <p style="text-align: center;">Exceptions: (No change to exceptions)</p> <p>(Same section in 2009) A107.5 Protection of electrical power supplies. When electrical pumps are used to provide the required water supply, such pumps shall be connected to a standby power source to automatically maintain electrical power in the event of power loss. The standby power source shall be capable of providing power for a minimum of two hours in accordance with Chapter 27 of the <i>International Building Code</i>, Section 604 of the <i>International Fire Code</i> and the ICC <i>Electrical Code</i> NFPA 70.</p> <p style="text-align: center;">Exception: (No change to exception)</p>
INTERNATIONAL ZONING CODE		
	<p><u>2006 Section</u> 1008.2.5</p>	<p><u>2009 Section</u> Same</p>