IBC — Fire Safety

2018 GROUP A PUBLIC COMMENT AGENDA

OCTOBER 24 - 31, 2018
GREATER RICHMOND CONVENTION CENTER
RICHMOND, VA

ICC
INTERNATIONAL CODE COUNCIL®

2018 Public Comment Agenda

First Printing

Publication Date: August 2018

PRINTED IN THE USA

FS3-18

IBC: 703.5.1, Chapter 35

Proposed Change as Submitted

Proponent: Tony Crimi, A.C. Consulting Solutions Inc., representing North American Insulation Manufacturers Association (NAIMA)

2018 International Building Code

Revise as follows

703.5.1 Elementary materials. Materials required to be noncombustible shall be tested in accordance with ASTM E136, or ASTM E2652, using the acceptance criteria prescribed by ASTM E136.

Add new standard(s) follows

ASTM

ASTM International
100 Barr Harbor Drive, P.O. Box C700
West Conshohocken PA 19428-2959

E2652-16:

Standard Test Method for Behavior of Materials in a Tube Furnace with a Cone-shaped Airflow Stabilizer at 750oC

Reason: Several of the I-Codes have varying definitions of the term “non-combustible material”, each based upon the way in which the concept of “non-combustible” is used within that Code. Throughout the ICC code system, the concept of “noncombustible material” is based on the idea that the material should not ignite or burn when subjected to fire or heat. Our intent is to require the same pass/fail criteria as currently exists in ASTM E136, using all fo the thermocouples required by ASTM E136, but using the ASTM E2652 apparatus. When ASTM E2652 is used, the pass/fail criteria and methodology are those required by ASTM E136.
The concept of “noncombustible materials” and “noncombustibility” in terms of types of construction is widely used throughout the International Codes. The IBC, IFC, IEBC and IFGC do not contain a separate definition of "noncombustible", even though they use the terminology “non-combustible materials”.

In common usage, the term “noncombustible” is used to denote materials which do not ignite or are not capable of sustaining combustion. The common Dictionary definitions for “noncombustible” are typically as follows:

> **Noncombustible, adj** – ***incapable of being burned***
>
> (Merriam -Webster’s International Dictionary of the English Language, Unabridged, 2013)

In the traditional use of the terminology and concept of “non-combustible” in the Codes has been based on acceptable performance when tested in accordance with ASTM E136, *Test Method for Behavior of Materials in a Vertical Tube Furnace at 750 Degrees C*. Materials passing the test are permitted limited flaming and other indications of combustion. However, these have traditionally been acceptable. Understandably, ASTM E136 does not replicate the full spectrum of actual building fire exposure conditions. However, this test method does provide an assessment indicating those materials which do not act to aid combustion or add appreciable heat to an ambient fire.

ASTM has published another standard ASTM E2652-16, entitled *Standard Test Method for Behavior of Materials in a Tube Furnace with a Cone-shaped Airflow Stabilizer, at 750°C.* This test method is similar to ASTM E136, but based on the international standard for Noncombustibility. The key difference between the two standards is in the equipment. The apparatuses in this test method and in Test Method E 136 is that the furnace tube in this test method has a conical air-flow stabilizer section attached at its bottom. Both test methods use cylindrical furnace tubes. Like ASTM E136, the test Standard does not include mandatory pass/fail criterion. It allows those criteria to be determined by the Codes or other users. Appendix X3 also contains a comparison of results obtained from this apparatus versus ASTM E136. ASTM E136 has already been revised to include ASTM E2652 as an alternate methodology.

Bibliography: ASTM E2652-16 - *Standard Test Method for Behavior of Materials in a Tube Furnace with a Cone- shaped Airflow Stabilizer, at 750°C.*

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This is an additional option only.

Analysis: A review of the standard proposed for inclusion in the code, ASTM E2562-16, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2018.

FS3-18

Public Hearing Results

Committee Action: **As Submitted**

Committee Reason: The proposal brings in a new standard as an option to ASTM E136. The two standards reference each other and are considered equivalent for testing materials. The committee expressed concern about the integration of FS2 and FS3, urging a public comment be submitted to meld FS3 revision into the format of the FS2 approved change. (Vote 14-0)

Assembly Action: **None**

FS3-18

Individual Consideration Agenda

Public Comment 1:

Proponent: Marcelo Hirschler, representing GBH International (mmh@gbhint.com)requests As Modified by This Public Comment.

Replace as follows:

2018 International Building Code

703.5 Noncombustibility tests. The tests indicated in ~~Sections~~ Section 703.5~~.1 and 703.5.2~~ .1 shall serve as criteria for acceptance of building materials as set forth in Sections 602.2, 602.3 and 602.4 in Types I, II, III and IV construction. The term ~~"noncombustible"~~ "noncombustible" does not apply to the flame spread characteristics of *interior finish* or *trim* materials. A material shall not be classified as a noncombustible building construction material if it is subject to an increase in combustibility or flame spread beyond the limitations herein established through the effects of age, moisture or other atmospheric conditions.

703.5.1 ~~Elementary~~ Noncombustible materials. Materials required to be noncombustible shall be tested in accordance with ASTM E136. Alternately, materials required to be noncombustible shall be tested in accordance with ASTM E2652 using the acceptance criteria prescribed by ASTM E136.

> **Exception:** Materials having a structural base of noncombustible material as determined in accordance with ASTM E136, or with ASTM E2652 using the acceptance criteria prescribed by ASTM E136, with a surfacing of 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 E84 or UL 723 shall be acceptable as non-combustible.

~~**703.5.2 Composite materials.** Materials having a structural base of noncombustible material as determined in accordance with Section 703.5.1 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 E84 or UL 723 shall be acceptable as noncombustible materials.~~

Commenter's Reason: This public comment incorporates into FS3 the changes accepted by the technical committee for both FS2 and FS3. This complies with the request of the technical committee. In the absence of this public comment, there may be a conflict between the code text approved in FS2 and FS3. This public comment uses the language accepted for FS2 and for FS3 and blends it.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This public comment (and the public proposal) simply adds an alternate test method for assessing noncombustibility.

FS3-18

FS5-18

IBC: 703.8

Proposed Change as Submitted

Proponent: Stephen DiGiovanni, representing ICC Ad Hoc Committee on Tall Wood Buildings (TWB) (TWB@iccsafe.org)

THIS CODE CHANGE WILL BE HEARD BY THE IBC GENERAL COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THIS COMMITTEE.

2018 International Building Code

Add new text as follows

703.8 Determination of noncombustible protection time contribution. . The time, in minutes, contributed to the fire resistance rating by the noncombustible protection of mass timber building elements, components, or assemblies, shall be established through a comparison of assemblies tested using procedures set forth in ASTM E 119 or UL 263. The test assemblies shall be identical in construction, loading, and materials, other than the noncombustible protection. The two test assemblies shall be tested to the same criteria of structural failure.

1. Test Assembly 1 shall be without protection.
2. Test Assembly 2 shall include the representative noncombustible protection. The protection shall be fully defined in terms of configuration details, attachment details, joint sealing details, accessories and all other relevant details.

The noncombustible protection time contribution shall be determined by subtracting the fire resistance time, in minutes, of Test Assembly 1 from the fire resistance time, in minutes, of Test Assembly 2.

Reason: The Ad Hoc Committee on Tall Wood Buildings (TWB) was created by the ICC Board to explore the science of tall wood buildings and take action on developing code changes for tall wood buildings. The TWB has created several code change proposals with respect to the concept of tall buildings of mass timber and the background information is at the end of this Statement. Within the statement are important links to information, including documents and videos, used in the deliberations which resulted in these proposals.
The TWB determined that the fire resistance rating of mass timber structural elements, embodied in a series of proposals including this one, shall consist of the inherent fire resistance rating of the mass timber and the additional fire resistance rating of the *Noncombustible Protection* described in new definitions proposals. The TWB determined that at least 2/3 of the required fire resistance rating should come from the *Noncombustible Protection.* The TWB decided to provide both a performance path, as embodied in this proposal, and a prescriptive path, embodied in another proposal for Section 722.7.

This proposal constitutes the performance path for determining the contribution of noncombustible protection for mass timber elements. The proposal outlines a protocol to accomplish this. This proposal should be considered as a companion proposal to the proposals creating new types of mass timber construction in Section 602.4 and the code proposal in Section 722.7. The proposed new Section 602.4 requires the use of noncombustible protection on most mass timber elements in most of the proposed new types of construction.

This proposal, new section 703.8, is created to provide the method by which any material not contained in the prescriptive Table in Section 722.7 may be tested to show the time, in minutes, which it contributes as *noncombustible protection*. This procedure is representative of the procedure used in the past to determine the protection times for various membranes in Section 722.6 Component Additive Method for wood construction. It is neither new nor ambiguous in its use. Recent testing by AWC confirms the values derived from historic testing. A report is available at the following link: http://bit.ly/WFC-firetestofGWBonCLT . This link was confirmed active on 12/27/17.

This procedure should not be confused with “membrane protection” which is based on temperature rise on the unexposed side of a membrane attached to construction elements. Noncombustible construction is, instead, noncombustible material meeting the requirements of Section 703.5. Its contribution to the fire resistance rating of any building element is determined by this proposed new section. Simply put, it is determined by measuring the fire resistance time, in minutes and determined by structural failure, of a mass timber building element and then conducting a second test measuring the fire resistance time, in minutes and determined by structural failure, of the identical mass timber element with identical load, construction and condition, but with the proposed noncombustible protection applied to it. The difference in time between the two samples is the contribution, in minutes, of the noncombustible protection.

Background information: The ICC Board approved the establishment of an ad hoc committee for tall wood buildings in December of 2015. The purpose of the ad hoc committee is to explore the science of tall wood buildings and to investigate the feasibility and take action on developing code changes for tall wood buildings. The committee is comprised of a balance of stakeholders with additional opportunities for interested parties to participate in the four Work Groups established by the ad hoc committee, namely: Code; Fire; Standards/Definitions; and Structural. For more information, be sure to visit the ICC website https://www.iccsafe.org/codes-tech-support/cs/icc-ad-hoc-committee-on-tall-wood-buildings/ (link active and up to date as of 12/27/17). As seen in the "Meeting Minutes and Documents" and "Resource Documents" sections of the committee web page, the ad hoc committee reviewed a substantial amount of information in order to provide technical justification for code proposals.

The ad hoc committee developed proposals for the followings code sections. The committee believes this package of code changes will result in regulations that adequately address the fire and life safety issues of tall mass timber buildings.

IBC Code Section	Description
403.3.2	Water supply requirements for fire pumps in high rise buildings of Type IVA and IVB construction.
504.3	Allowable building height (feet) for buildings of Type IVA, IVB and IVC construction. No changes to Type IV HT construction.
504.4	Allowable building height (stories) for buildings of Type IVA, IVB and IVC construction. No changes to Type IV HT.
506.2	Allowable building area for buildings of Type IVA, IVB and IVC construction. No changes to Type IV HT.
508.4.4.1 509.4.1.1 (new)	Requirements for mass timber building elements serving as fire barriers or horizontal assemblies in buildings of Type IVB of IVC construction.
602.4	Type of Construction requirements for new proposed types of construction: Types IVA, IVB and IVC. No changes to Type IV HT construction. Includes definitions for new terms: Mass timber and Noncombustible protection (mass timber). **THIS IS THE KEY CODE CHANGE PROPOSAL WHICH OUTLINES THE CONSTRUCTION REQUIREMENTS FOR THE PROPOSED NEW TYPE OF MASS TIMBER BUILDINGS. THE PROPOSAL ALSO ADDRESSES CONCEALED SPACES, ADHESIVE PERFORMANCE AND EXTERIOR WALL PROTECTION.**
703.8 (new)	The performance method to determine the increase to the fire resistance rating provided by noncombustible protection applied to the mass timber building element.
703.9 (new)	Requirements for sealants and adhesives to be placed at abutting edges and intersections of mass timber building elements. The reason statement references a Group B proposal to Chapter 17 for special inspection requirements of sealants and adhesives.
718.2.1	Requirements on the use of mass timber building elements used for Fireblocking.
722.7 (new)	Requirements for the fire resistance rating of mass timber elements, including minimum required protection and gypsum board attachment requirements.
3102	Requirements for membrane structures using Type IV HT construction.
3314.7 (new)	New special precautions during construction of buildings of Types IVA, IVB and IVC construction: Standpipes; Water supply for fire department connections; Noncombustible protection required for mass timber elements as construction height increases.
Appendix	Requirements for walls, floors and roofs of Type IV HT construction in buildings located in Fire Districts.
IFC Code Section	**Description**
701.6	Requirements which stipulate the owner's responsibility to maintain inventory of all required fire resistance rated construction in buildings of Types IVA and IVB construction. This includes an annual inspection and proper repair where necessary.
Proposed changes to be submitted in 2019 Group B	
IBC Chapter 17	Required special inspections of mass timber construction • Structural • Sealants and adhesives (see IBC 703.8)
IBC Chapter 23	An update to referenced standard APA PRG 320 Standard for Performance –rated Cross-laminated Timber which is currently undergoing revision to ensure the adequacy of the adhesives under fire conditions.

In addition, fire tests designed to simulate the three new construction types (Types IVA, IVB and IVC) in the ad hoc committee proposals were conducted at the Alcohol Tobacco and Firearms test lab facility. The TWB was involved in the design of the tests, and many members witnessed the test in person or online. The results of the series of 5 fire tests provide additional support for these proposals, and validate the fire performance for each of the types of construction proposed by the committee. The fire tests consisted of one-bedroom apartments on two levels, with both apartments having a corridor leading to a stair. The purpose of the tests was to address the contribution of mass timber to a fire, the performance of connections, the performance of through-penetration fire stops, and to evaluate conditions for responding fire personnel.

To review a summary of the fire tests, please visit:

http://bit.ly/ATF-firetestreport

To watch summary videos of the fire tests, which are accelerated to run in 3 ½ minutes, please visit:

http://bit.ly/ATF-firetestvideos

Both of these links were confirmed active on 12/27/17.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This section provides information that was not previously set forth in the code, and does not change the requirements of current code, thus there is no cost impact when compared with present requirements.

FS5-18

Public Hearing Results

Committee Action: **As Submitted**

Committee Reason: The proponents have done their homework. This is how heavy timber should be done. The western fire test validated this approach and that should be taken into consideration. (Vote: 14-0)

Assembly Action: **None**

FS5-18

Individual Consideration Agenda

Public Comment 1:

Proponent: Jonathan Humble, American Iron and Steel Institute, representing American Iron and Steel Institute (jhumble@steel.org)requests Disapprove.

Commenter's Reason: We recommend disapproval of this code change proposal.
The proposal uses the phrase noncombustible protection time contribution which is misleading because the test process described allows both the contribution of the non-combustible protection in addition to the mass timber (wood) behind the protection to determine protection time.

This represents re-writing of an existing standard through the ICC code development process, which has historically been rejected in the past. This work should first be evaluated by the standard writing organizations.

Neither ASTM E119 or UL 263 contain criteria of structural failure (in those exact words) that FS5-18 suggests where it states, in part, "The two test assemblies shall be tested to the same criteria of structural failure ". As a result, because of use this different terminology from the test standards it is not clear what criteria should be used.

Bibliography: ASTM-E119, “Standard Test Methods for Fire Tests of Building Construction and Materials”, ASTM International, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959
www.astm.org

UL-263, “Standard for Safety Fire Tests of Building Construction and Materials”, UL Headquarters, 333 Pfingsten Road, Northbrook, IL 60062, USA

http://www.ul.com

https://www.standardsportal.org/usa_en/sdo/ul.as

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
There will be no cost impact because if disapproved the materials in question will have to follow the current IBC requirements for fire resistance.

Public Comment 2:

Proponent: Dan Nichols, representing ICC Code Correlation Committee (ccc@iccsafe.org).

Commenter's Reason: The Code Correlation Committee (CCC) is not taking a position on this code change. The CCC submitted this public comment in order to bring a correlation issue to the attention of the full voting membership for the Public Comment Hearings and the Online Governmental Consensus Vote to allow the voting membership to coordinate actions on a package of code changes submitted dealing with tall wood buildings of mass timber construction. This package includes the parent proposal G108-18; if disapproved, the related proposals G28-18, G75-18, G80-18, G84-18, G89-18, FS5-18, FS6-18, FS73-18, FS81-18 and F266-18, will not be correlated with any existing code text if they are approved.
The Code Correlation Committee is a standing committee of the International Code Council whose objectives, procedures and organization are set forth in Council Policy CP#44-13. The objective of the Code Correlation Committee is to maintain technical and editorial consistency among the International Codes and to assist staff in the evaluation and processing of code change proposals and comments that are exclusively editorial.

FS5-18

FS6-18

IBC: 703.9 (New), Chapter 35

Proposed Change as Submitted

Proponent: Stephen DiGiovanni, representing ICC Ad Hoc Committee on Tall Wood Buildings (TWB) (TWB@iccsafe.org)

THIS CODE CHANGE WILL BE HEARD BY THE IBC GENERAL COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THIS COMMITTEE.

2018 International Building Code

Add new text as follows

703.9 Sealing of adjacent mass timber elements. In buildings of Type IVA, IVB, and IVC construction, sealant or adhesive shall be provided to resist the passage of air in the following locations:

1. At abutting edges and intersections of mass timber building elements required to be fire resistance-rated
2. At abutting intersections of mass timber building elements and building elements of other materials where both are required to be fire resistance-rated.

Sealants shall meet the requirements of ASTM C920. Adhesives shall meet the requirements of ASTM D3498.

Exception: Where sealant or adhesive is not a required component of a fire resistance-rated assembly.

Add new standard(s) follows

ASTM

ASTM International
100 Barr Harbor Drive, P.O. Box C700
West Conshohocken PA 19428-2959
US

D3498-03(2011):

Standard Specification for Adhesives for Field-Gluing Plywood to Lumber Framing for Floor Systems

Reason: The Ad Hoc Committee on Tall Wood Buildings (TWB) was created by the ICC Board to explore the science of tall wood buildings and take action on developing code changes for tall wood buildings. The TWB has created several code change proposals with respect to the concept of tall buildings of mass timber and the background information is at the end of this Statement. Within the statement are important links to information, including documents and videos, used in the deliberations which resulted in these proposals.
Mass timber has inherent properties of fire resistance, serving both to provide structural fire resistance and to safeguard against the spread of fire and smoke within a building or the spread of fire between structures.

When mass timber panels are connected together, fire tests have demonstrated that it is important for the abutting edges and intersections in the plane of and between the different planes of panels that form a separation to be sealed. The structures tested as part of the fire tests supporting this submittal were constructed with this sealing.

To review a summary of the fire tests, please visit:

http://bit.ly/ATF-firetestreport

To watch summary videos of the fire tests, which are accelerated to run in 3-1/2 minutes each, please visit: http://bit.ly/ATF-firetestvideos.

Both of these links were confirmed active on 12/27/17.

The US CLT manual recommends a bead of construction adhesive. Construction adhesive or other sealant can be used to prevent air flow. When a wall or horizontal assembly serves as the separation between two atmospheres, a fire creates differential pressure where heated gasses raise the pressure and work to drive fire and hot gasses through the structure. Voids that are not properly sealed can serve as a conduit for air movement during a fire, so abutting edges and intersections are recommended to be sealed.

Periodic special inspections during construction are required to make sure it is clear that the appropriate sealant or

adhesive is used and to establish inspections to verify for ongoing quality control. However, Chapter 17 is a Group B topic. It will be taken up then. It is shown below for clarity and to emphasize the importance the TWB places on proper application of sealants and adhesives in mass timber construction.

1705.19 Sealing of Mass Timber. Periodic special inspections of sealants or adhesives shall be conducted where sealant or adhesive required by Section 703.9 is applied to mass timber building elements as designated in the approved construction documents.

Some panels are manufactured under proprietary processes to ensure there are no voids at these intersections. Where this proprietary process is incorporated and tested, there is no requirement for sealant or adhesive and an exception is provided for this instance. Where the sealant is not required and is not specifically excluded it is still considered to be a good practice covered by this section.

This code change proposal does not apply to "joints" as defined in Section 202 of the IBC as joints have their own requirements for the placement and inspection of fire resistant joint systems in IBC Section 715. Joints are defined as having an opening that is designed to accommodate building tolerances or to allow independent movement. Panels and members that are connected together as covered by this code change proposal do not meet the definition of a joint since they are rigidly connected and do not have an opening.

Background information: The ICC Board approved the establishment of an ad hoc committee for tall wood buildings in December of 2015. The purpose of the ad hoc committee is to explore the science of tall wood buildings and to investigate the feasibility and take action on developing code changes for tall wood buildings. The committee is comprised of a balance of stakeholders with additional opportunities for interested parties to participate in the four Work Groups established by the ad hoc committee, namely: Code; Fire; Standards/Definitions; and Structural. For more information, be sure to visit the ICC website https://www.iccsafe.org/codes-tech-support/cs/icc-ad-hoc-committee-on-tall-wood-buildings/ (link active and up to date as of 12/27/17). As seen in the "Meeting Minutes and Documents" and "Resource Documents" sections of the committee web page, the ad hoc committee reviewed a substantial amount of information in order to provide technical justification for code proposals.

The ad hoc committee developed proposals for the followings code sections. The committee believes this package of code changes will result in regulations that adequately address the fire and life safety issues of tall mass timber buildings.

IBC Code Section	Description
403.3.2	Water supply requirements for fire pumps in high rise buildings of Type IVA and IVB construction.
504.3	Allowable building height (feet) for buildings of Type IVA, IVB and IVC construction. No changes to Type IV HT construction.
504.4	Allowable building height (stories) for buildings of Type IVA, IVB and IVC construction. No changes to Type IV HT.
506.2	Allowable building area for buildings of Type IVA, IVB and IVC construction. No changes to Type IV HT.
508.4.4.1 509.4.1.1 (new)	Requirements for mass timber building elements serving as fire barriers or horizontal assemblies in buildings of Type IVB of IVC construction.
602.4	Type of Construction requirements for new proposed types of construction: Types IVA, IVB and IVC. No changes to Type IV HT construction. Includes definitions for new terms: Mass timber and Noncombustible protection (mass timber). **THIS IS THE KEY CODE CHANGE PROPOSAL WHICH OUTLINES THE CONSTRUCTION REQUIREMENTS FOR THE PROPOSED NEW TYPE OF MASS TIMBER BUILDINGS. THE PROPOSAL ALSO ADDRESSES CONCEALED SPACES, ADHESIVE PERFORMANCE AND EXTERIOR WALL PROTECTION.**
703.8 (new)	The performance method to determine the increase to the fire resistance rating provided by noncombustible protection applied to the mass timber building element.
703.9 (new)	Requirements for sealants and adhesives to be placed at abutting edges and intersections of mass timber building elements. The reason statement references a Group B proposal to Chapter 17 for special inspection requirements of sealants and adhesives.
718.2.1	Requirements on the use of mass timber building elements used for Fireblocking.
722.7 (new)	Requirements for the fire resistance rating of mass timber elements, including minimum required protection and gypsum board attachment requirements.
3102	Requirements for membrane structures using Type IV HT construction.
3314.7 (new)	New special precautions during construction of buildings of Types IVA, IVB and IVC construction: Standpipes; Water supply for fire department connections; Noncombustible protection required for mass timber elements as construction height increases.
Appendix	Requirements for walls, floors and roofs of Type IV HT construction in buildings located in Fire Districts.
IFC Code Section	**Description**
701.6	Requirements which stipulate the owner's responsibility to maintain inventory of all required fire resistance rated construction in buildings of Types IVA and IVB construction. This includes an annual inspection and proper repair where necessary.
Proposed changes to be submitted in 2019 Group B	
IBC Chapter 17	Required special inspections of mass timber construction • Structural • Sealants and adhesives (see IBC 703.8)
IBC Chapter 23	An update to referenced standard APA PRG 320 Standard for Performance –rated Cross-laminated Timber which is currently undergoing revision to ensure the adequacy of the adhesives under fire conditions.

In addition, fire tests designed to simulate the three new construction types (Types IVA, IVB and IVC) in the ad hoc committee proposals were conducted at the Alcohol Tobacco and Firearms test lab facility. The TWB was involved in the design of the tests, and many members witnessed the test in person or online. The results of the series of 5 fire tests provide additional support for these proposals, and validate the fire performance for each of the types of construction proposed by the committee. The fire tests consisted of one-bedroom apartments on two levels, with both apartments having a corridor leading to a stair. The purpose of the tests was to address the contribution of mass timber to a fire, the performance of connections, the performance of through-penetration fire stops, and to evaluate conditions for responding fire personnel.

To review a summary of the fire tests, please visit:

http://bit.ly/ATF-firetestreport

To watch summary videos of the fire tests, which are accelerated to run in 3 ½ minutes, please visit:

http://bit.ly/ATF-firetestvideos

Both of these links were confirmed active on 12/27/17.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This section provides information that was not previously set forth in the code, and does not change the requirements of current code, thus there is no cost impact when compared with present requirements.

Analysis: A review of the standard proposed for inclusion in the code, ASTM D3498-03(2011), with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2018.

FS6-18

Public Hearing Results

Committee Action: **As Submitted**

Committee Reason: This is necessary to maintain the integrity of the system. It was suggested that a public comment related to the proposed modification may be in order. (Vote: 14-0)

Assembly Action: **None**

FS6-18

Individual Consideration Agenda

Public Comment 1:

Proponent: Stephen DiGiovanni, representing Ad Hoc Committee for Tall Wood Buildings (sdigiovanni@clarkcountynv.gov)requests As Modified by This Public Comment.

Further modify as follows:

2018 International Building Code

703.9 Sealing of adjacent mass timber elements. In buildings of Type IVA, IVB, and IVC construction, sealant or adhesive shall be provided to resist the passage of air in the following locations:

1. At abutting edges and intersections of mass timber building elements required to be fire resistance-rated
2. At abutting intersections of mass timber building elements and building elements of other materials where both are required to be fire resistance-rated.

Sealants shall meet the requirements of ASTM C920. Adhesives shall meet the requirements of ASTM D3498.

Exception: ~~Where sealant or adhesive is not~~ Sealants or adhesives need not be provided where they are not a required component of a tested fire resistance-rated assembly.

1705.19 Sealing of mass timber Periodic special inspections of sealants or adhesives shall be conducted where sealant or adhesive required by Section 703.9 is applied to mass timber building elements as designated in the approved construction documents.

Commenter's Reason: There are two changes proposed. The first change is to the exception for proposed Section 703.9. The original wording of the exception was not clear as to whether it exempted sealants from meeting the ASTM standards, or whether it was intended to exempt the sealant altogether. This exception is expanded to clarify that sealants and adhesives are not required where voids are a part of a tested fire assembly, when such assembly is tested without the use of sealants and adhesives in the void space. The second change adds a special inspection requirement to address sealants and adhesives that are a part of the required design. There is a need to ensure that the details of construction are adhered to, and the special inspection is seen as a means to ensure that these construction details are adequately emphasized during the construction process. This change was proposed as a modification during code hearings and ruled out of order at that time, and in doing so the committee suggested that the appropriate path for adding the special inspection requirement was to submit this public comment.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This section provides information that was not previously set forth in the code, and does not change the requirements of current code, thus there is no cost impact when compared with present requirements.

Public Comment 2:

Proponent: Dan Nichols, representing ICC Code Correlation Committee (ccc@iccsafe.org).

Commenter's Reason: The Code Correlation Committee (CCC) is not taking a position on this code change. The CCC submitted this public comment in order to bring a correlation issue to the attention of the full voting membership for the Public Comment Hearings and the Online Governmental Consensus Vote to allow the voting membership to coordinate actions on a package of code changes submitted dealing with tall wood buildings of mass timber construction. This package includes the parent proposal G108-18; if disapproved, the related proposals G28-18, G75-18, G80-18, G84-18,

G89-18, FS5-18, FS6-18, FS73-18, FS81-18 and F266-18, will not be correlated with any existing code text if they are approved.

The Code Correlation Committee is a standing committee of the International Code Council whose objectives, procedures and organization are set forth in Council Policy CP#44-13. The objective of the Code Correlation Committee is to maintain technical and editorial consistency among the International Codes and to assist staff in the evaluation and processing of code change proposals and comments that are exclusively editorial.

FS6-18

FS8-18

IBC: 704.6.1 (New)

Proposed Change as Submitted

Proponent: Crystal Sujeski, representing Crystal Sujeski (crystal.sujeski@fire.ca.gov)

2018 International Building Code

704.6 Attachments to structural members. The edges of lugs, brackets, rivets and bolt heads attached to structural members shall be permitted to extend to within 1 inch (25 mm) of the surface of the fire protection.

Add new text as follows

704.6.1 Secondary (non-structural) attachments to structural members. Where primary and secondary structural steel members require fire protection, secondary (non-structural) tubular steel attachments to those structural members shall be protected with the same fire resistive rating as required for the structural member. The protection shall extend from the structural member a distance of not less than 12 inches. An open tubular attachment shall be filled with an equivalent fire protection method for a distance of 12-inch length from the structural member, or the entire length of the open tube, whichever is less.

Reason: Primary structural frame members shall comply with Table 601 for fire resistance rating. Secondary (non-structural) steel tubes provide support for a building's exterior curtain wall and are thereby considered to be unrated members that do not require any fire protection. The connection of non-structural tubes to primary structural members has potentially adverse thermal effects on the required fire resistance rating of the primary steel frame members.

Building attachments for miscellaneous non-structural items (hangers, braces, framing tracks, erection lifting lugs, wall supports, etc.) are typically not required to be individually fire protected. In addition, fire resistance rated assemblies are tested without attachments, and with a homogeneous and continuous protection system or material. Thus, rated assemblies are explicitly limited to only the tested or approved components given in the published listing, which does not include bare steel attachments or discontinuous member protection. If such secondary steel attachments are connected to a fire resistance rated steel assembly, they may jeopardize the assembly's rating and protection system by the introduction of "thermal shorts", which can cause unexpected and excessive heat conduction, convection, or radiation through the attachment or its connection to the primary assembly.

The proposal to require a 12-inch extension of fireproofing on all non-structural attachments is based on a general industry practice as described in ANSI/UL 263 BXUV (exhibit C). Attached in the documentation is exhibit A, a letter from Steve Unser, a chief building official from the City of Creve Coeur, MO stating a policy to address the "12- inch rule" of fireproofing structural attachments to fireproofed beams and columns.

Moreover, in cases where an open tubular steel connection is utilized it is vital that the interior surfaces of the tube walls are fireproofed and the bottom ends of the tubes are closed. Without this protection, this condition results in bare (unprotected) steel areas at the attachment that could be directly exposed to radiant and convective heat from a fire source.

Attached (exhibit B1 and B2) is a modeling analysis of a high-rise project in Stockton, CA prepared by Jensen Hughes Senior Engineers Nestor Iwankiw and Thomas Forsythe. Their analysis further supports the proposed code change that would require fire proofing of secondary non-structural attachments.

Under the current code, fire-proofing requirements for non-structural attachments and their connections remain ambiguous. This lack of clarity makes fire protection enforcement difficult due to increased construction costs for contractors, builders and owners. Furthermore, special inspectors, fire and building officials are not taught to look for these deficiencies, resulting in numerous buildings with unprotected steel that can potentially have serious implications on public safety and welfare.

The proposal establishes a legal basis for requiring the additional fire protection as described herein.

The 'attached' documentation can be viewed at this link established 2/21/18

https://www.dropbox.com/sh/t0hlmrxf63gejfh/AABEvqgYih_QPK928kuUwazKa?dl=0

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

This code change will increase the cost of construction; however, without additional fire protection the structural integrity of the building may be compromised.

FS8-18

Public Hearing Results

Committee Action: As Modified

Committee Modification: 704.6.1 Secondary ~~(non-structural)~~ attachments to structural members. Where primary and secondary structural steel members require fire protection, secondary ~~(non-structural)~~ tubular steel attachments to those structural members shall be protected with the same fire resistive ~~rating~~ material and thickness as required for the structural member. The protection shall extend away from the structural member a distance of not less than 12 inches, or shall be applied to the entire length when the attachment is less than 12 inches long. ~~An~~ When the ends are open, the fire resistive material and thickness shall be applied to both exterior and interior of the tubular steel attachment. ~~shall be filled with an equivalent fire-protection method for a distance of 12-inch length from the structural member, or the entire length of the open tube, whichever is less~~.

Committee Reason: The modification refines the language to better reflect the intent of the proposal. The change clarifies an area of framing and the appropriate level of protection. Structural tubing has been a question of the years and there is evidence of heat transferring into the structure from such tubing. Perhaps a public comment expanding this solution to other attachments of shapes other than tubular. (Vote 11-3)

Assembly Action: None

FS8-18

Individual Consideration Agenda

Public Comment 1:

Proponent: Crystal Sujeski, representing Crystal Sujeski (crystal.sujeski@fire.ca.gov)requests As Modified by This Public Comment.

Modify as follows:

2018 International Building Code

704.6.1 Secondary attachments to structural members. Where primary and secondary structural members require fire protection, secondary ~~tubular~~ steel attachments to those structural members shall be protected with the same fire resistive material and thickness as required for the structural member. The protection shall extend away from the structural member a distance of not less than 12 inches, or shall be applied to the entire length when the attachment is less than 12 inches long. When an attachment is hollow and the ends are open, the fire resistive material and thickness shall be applied to both the exterior and interior of the ~~tubular~~ hollow steel attachment.

Commenter's Reason: This public comment has modified the proposal FS-8 to address the committee comments to expand the requirements for fire protection to be all inclusive of secondary steel attachments and not just limited to tubular steel.

Cost Impact: The net effect of the public comment and code change proposal will increase the cost of construction The cost of construction will be increased minimally, however without additional fire protection the structural integrity of the building may be compromised.

FS8-18

FS10-18

IBC: 202, 202, 704.14, 603.1, 722.5.2.2, 722.5.2.3

Proposed Change as Submitted

Proponent: Bill McHugh, The McHugh Company, representing National Fireproofing Contractors Association (Bill@mc-hugh.us)

2018 International Building Code

SECTION 202 DEFINITIONS

Revise as follows

~~**[BF]**~~ **INTUMESCENT FIRE-RESISTANT** ~~**COATINGS.**~~**MATERIALS.** Thin film liquid mixture applied to substrates~~ by brush, roller, spray or trowel which~~ , intumescent fire-resistive material expands into a protective ~~foamed~~ layer to provide fire-resistant protection of the substrates when exposed to flame or intense heat.

Add new text as follows

704.14 Intumescent fire-resistant materials (IFRM). Intumescent fire-resistant materials (IFRM) shall be consistent with the fire-resistance rating, the listing and manufacturers installation instructions. The instructions shall include, but are not limited to, substrate condition, application temperatures, surface conditions and IFRM handling, storage, mixing, conveyance, method of application, curing and ventilation. The finished condition of IFRM applied to structural members or horizontal assemblies shall not, upon complete drying or curing, exhibit delamination.

Revise as follows

603.1 Allowable materials. Combustible materials shall be permitted in buildings of Type I or 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 fire-resistance-rated construction is not required.
   1.3. Roof construction, including girders, trusses, framing and decking.

   Exception: In buildings of Type IA construction exceeding two *stories above grade plane*, *fire-retardant-treated wood* is not permitted in roof construction where the vertical distance from the upper floor to the roof is less than 20 feet (6096 mm).

   1.4. Balconies, porches, decks and exterior stairways not used as required exits on buildings three *stories* or less above grade plane.

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 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 Section 803.
8. *Trim* installed in accordance with Section 806.
9. Where not installed greater than 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.
10. Finish flooring installed in accordance with Section 805.
11. Partitions dividing portions of stores, offices or similar places occupied by one tenant only and that do not establish a *corridor* serving an *occupant load* of 30 or more shall be permitted to be constructed of *fire-retardant-treated* wood, 1-hour fire-resistance-rated construction or of wood panels or similar light construction up to 6 feet (1829 mm) in height.
12. Stages and platforms constructed in accordance with Sections 410.2 and 410.3, respectively.
13. Combustible *exterior wall coverings*, balconies and similar projections and bay or oriel windows in accordance with Chapter 14 and Section 705.2.3.1.
14. Blocking such as for handrails, millwork, cabinets and window and door frames.
15. Light-transmitting plastics as permitted by Chapter 26.
16. Mastics and caulking materials applied to provide flexible seals between components of *exterior wall* construction.
17. Exterior plastic veneer installed in accordance with Section 2605.2.
18. Nailing or furring strips as permitted by Section 803.15.
19. Heavy timber as permitted by Note c to Table 601 and Sections 602.4.3 and 705.2.3.1.
20. Aggregates, component materials and admixtures as permitted by Section 703.2.2.
21. Sprayed fire-resistant materials and intumescent and mastic fire-resistant ~~coatings~~ materials, determined on the basis of *fire resistance* tests in accordance with Section 703.2 and installed in accordance with Sections 1705.14 and 1705.15, respectively.

22. Materials used to protect penetrations in fire-resistance-rated assemblies in accordance with Section 714.
23. Materials used to protect joints in fire-resistance-rated assemblies in accordance with Section 715.
24. Materials allowed in the concealed spaces of buildings of Types I and II construction in accordance with Section 718.5.
25. Materials exposed within plenums complying with Section 602 of the International Mechanical Code.
26. Wall construction of freezers and coolers of less than 1,000 square feet (92.9 m^2), in size, lined on both sides with noncombustible materials and the building is protected throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1.

722.5.2.2 Sprayed fire-resistant materials. The provisions in this section apply to structural steel beams and girders protected with 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:

$$h_2 = h_1 \, [(W_1 / D_1) + 0.60] \, / \, [(W_2 / D_2) + 0.60]$$

(Equation 7-17)

where:

h = Thickness of 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~~ materials shall be determined on the basis of fire-resistance tests in accordance with Section 703.2.

722.5.2.3 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 722.5.1.3. 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 722.5.1.1. The weight-to-heated-perimeter ratio (*W/D*) of truss elements that directly support floor or roof assembly shall be determined on the same basis as beams and girders, as specified in Section 722.5.2.1.The *fire resistance* of structural steel trusses protected with intumescent or mastic fire-resistant ~~coatings~~ materials shall be determined on the basis of *fire resistance* tests in accordance with Section 703.2.

Reason: There has been a section in the IBC that refers to Sprayed Fire-Resistant Materials (SFRM) for many years. Currently is no section in the IBC for a different type of material that produces the same result, Intumescent Fire-Resistant Materials (IFRM). The requirements for IFRM are as important as those for SFRM. Therefore, this section should be added to the code. The language is taken from the SFRM section and modified to fit IFRM's.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Adding this section to the code brings another option for fire-resistance in buildings.

FS10-18

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: While there was support from committee members to change the terminology from 'coatings' to 'materials', the overall proposal was not ready for approval. The definition was found to be confusing. The wording of Section 704.14 implies that the IFRM meets the fire resistance rating where is the IFRM and the base to which it is applied that is meeting the rating. Section 705.15 should also be revised to correlate with the new definition. Committee encouraged the proponent to fix the various issues and bring a public comment to the Richmond hearing. (Vote 8-6)

Assembly Action: **None**

FS10-18

Individual Consideration Agenda

Public Comment 1:

Proponent: William McHugh, The McHugh Company, representing National Fireproofing Contractors Association (billmchugh-jr@att.net)requests As Modified by This Public Comment.

Modify as follows:

2018 International Building Code

SECTION 202 DEFINITIONS

INTUMESCENT FIRE-RESISTANT MATERIALS. Thin film liquid mixture applied to substrates, intumescent fire-~~resistive~~ resistant material expands into a protective layer to provide fire-resistant protection of the substrates when exposed to flame or intense heat.

603.1 Allowable materials. Combustible materials shall be permitted in buildings of Type I or 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 fire-resistance-rated construction is not required.
   1.3. Roof construction, including girders, trusses, framing and decking.

   Exception: In buildings of Type IA construction exceeding two *stories above grade plane*, *fire-retardant-treated wood* is not permitted in roof construction where the vertical distance from the upper floor to the roof is less than 20 feet (6096 mm).

   1.4. Balconies, porches, decks and exterior stairways not used as required exits on buildings three *stories* or less above grade plane.

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 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 Section 803.
8. *Trim* installed in accordance with Section 806.
9. Where not installed greater than 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.
10. Finish flooring installed in accordance with Section 805.
11. Partitions dividing portions of stores, offices or similar places occupied by one tenant only and that do not establish a *corridor* serving an *occupant load* of 30 or more shall be permitted to be constructed of *fire-retardant-treated* wood, 1-hour fire-resistance-rated construction or of wood panels or similar light construction up to 6 feet (1829 mm) in height.
12. Stages and platforms constructed in accordance with Sections 410.2 and 410.3, respectively.
13. Combustible *exterior wall coverings*, balconies and similar projections and bay or oriel windows in accordance with Chapter 14 and Section 705.2.3.1.
14. Blocking such as for handrails, millwork, cabinets and window and door frames.
15. Light-transmitting plastics as permitted by Chapter 26.
16. Mastics and caulking materials applied to provide flexible seals between components of *exterior wall* construction.
17. Exterior plastic veneer installed in accordance with Section 2605.2.
18. Nailing or furring strips as permitted by Section 803.15.
19. Heavy timber as permitted by Note c to Table 601 and Sections 602.4.3 and 705.2.3.1.
20. Aggregates, component materials and admixtures as permitted by Section 703.2.2.
21. Sprayed fire-resistant materials and intumescent ~~and mastic~~ fire-resistant materials, determined on the basis of *fire resistance* tests in accordance with Section 703.2 and installed in accordance with Sections 1705.14 and 1705.15, respectively.

22. Materials used to protect penetrations in fire-resistance-rated assemblies in accordance with Section 714.
23. Materials used to protect joints in fire-resistance-rated assemblies in accordance with Section 715.
24. Materials allowed in the concealed spaces of buildings of Types I and II construction in accordance with Section 718.5.
25. Materials exposed within plenums complying with Section 602 of the International Mechanical Code.
26. Wall construction of freezers and coolers of less than 1,000 square feet (92.9 m^2), in size, lined on both sides with noncombustible materials and the building is protected throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1.

704.14 Intumescent fire-resistant materials (IFRM). Intumescent fire-resistant materials (IFRM) shall ~~be consistent with the fire-resistance rating, the listing and manufacturers installation instructions. The instructions shall include, but are not limited to, substrate condition, application temperatures, surface conditions and IFRM handling, storage, mixing, conveyance, method of application, curing and ventilation. The finished condition of IFRM applied to structural members or horizontal assemblies shall not, upon complete drying or curing, exhibit delamination.~~ comply with Section 704.14.1

704.14.1 Intumescent fire-resistant materials (IFRM). Intumescent fire-resistant materials (IFRM) shall be installed in accordance with the listing and the manufacturers installation instructions.

722.5.1.3 Sprayed fire-resistant materials. The *fire resistance* of wide-flange structural steel columns protected with sprayed fire-resistant materials, as illustrated in Figure 722.5.1(5), shall be permitted to be determined from the following expression:

$$R = [C1(W/D) + C2]h$$

where: **(Equation 7-13)**

R = Fire resistance (minutes).

h = Thickness of 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~~ materials shall be determined on the basis of *fire-resistance* tests in accordance with Section 703.2.

722.5.2.2 Sprayed fire-resistant materials. The provisions in this section apply to structural steel beams and girders protected with 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:

$$h2 = h1 [(W1 / D1) + 0.60] / [(W2 / D2) + 0.60]$$

where: **(Equation 7-17)**

h = Thickness of 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~~ materials shall be determined on the basis of fire-resistance tests in accordance with Section 703.2.

722.5.2.3 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 722.5.1.3. 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 722.5.1.1. The weight-to-heated-perimeter ratio (*W/D*) of truss elements that directly support floor or roof assembly shall be determined on the same basis as beams and girders, as specified in Section 722.5.2.1.The *fire resistance* of structural steel trusses protected with intumescent ~~or mastic~~ fire-resistant materials shall be determined on the basis of *fire resistance* tests in accordance with Section 703.2.

[BF] 1705.15 ~~Mastic and intumescent~~ Intumescent fire-resistant ~~coatings~~materials. *Special inspections* and tests for ~~mastic and~~ intumescent fire-resistant ~~coatings~~ materials applied to structural elements and decks shall be performed in accordance with AWCI 12-B. *Special inspections* and tests shall be based on the fire-resistance design as designated in the *approved construction documents*.

Commenter's Reason: The concept of defining Intumescent fire-resistant Materials (IFRM) in the context of fireproofing had very positive comments from the Fire-Safety Committee. This public comment is submitted to address the objections of the opponents and suggestions from the committee to modify the sections 714, 722..5.1.3, 722.5.2.2, 722.5.2.3 and 1705.15, to make the definition clearer, and coordinate the new definition in other areas of the code that were not in the original proposal. Additionally, for additional clarity, section 714 was broken into two sections, with an installation section added for consistency among the material categories.

The key change was moving the term from Mastic and intumescent fire-resistant coatings to to the term Intumescent fire-resistant materials (IFRM). These IFRM s are defined and scoped for use as materials used with structural building elements and or assemblies. The IFRM s are not meant to be used to fill gaps at doors, windows, or used as firestopping.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This is a terminology change and not a technical change and does not increase costs.

FS10-18

FS15-18

IBC: 202, 202, 705.2, Table TABLE 705.2, 705.2.1, 705.2.2, 705.2.3, 705.2.3.1, 705.3

Proposed Change as Submitted

Proponent: Stephen Thomas, Colorado Code Consulting, LLC, representing Himself (sthomas@coloradocode.net)

2018 International Building Code

SECTION 202 DEFINITIONS

Add new definition as follows

BUILDING PROJECTION. An unenclosed floor, roof or appendage extending beyond the exterior wall of a building such as, but not limited to cornices, eave overhangs, exterior decks or balconies, porte cocheres and similar protrusions.

Revise as follows

705.2 ~~Projections.~~ Building projections. . ~~Cornices, eave overhangs, exterior balconies and similar projections extending beyond the exterior wall~~ Building projections shall conform to the requirements of this section and Section 1405. Exterior egress balconies and exterior exit stairways and ramps shall comply with Sections 1021 and 1027, respectively. ~~Projections~~ Building projections shall not extend any closer to the line used to determine the *fire separation distance* than shown in Table 705.2.

Exception: Buildings on the same lot and considered as portions of one building in accordance with Section 705.3 are not required to comply with this section for projections between the buildings.

TABLE 705.2
MINIMUM DISTANCE OF BUILDING PROJECTION

FIRE SEPARATION DISTANCE-FSD (feet)	MINIMUM DISTANCE FROM LINE USED TO DETERMINE FSD
0 to less than 2	Projections not permitted
2 to less than 3	24 inches
3 to less than 5	24 inches plus 8 inches for every foot of FSD beyond 3 feet or fraction thereof
5 or greater	40 inches

For SI: 1 foot = 304.8 mm; 1 inch = 25.4 mm.

705.2.1 Types I and II construction. ~~Projections~~ Building projections from walls of Type I or II construction shall be of noncombustible materials or combustible materials as allowed by Sections 705.2.3.1 and 705.2.4.

705.2.2 Type III, IV or V construction. ~~Projections~~ Building projections from walls of Type III, IV or V construction shall be of any *approved* material.

705.2.3 Combustible building projections. Combustible building projections extending to within 5 feet (1524 mm) of the line used to determine the *fire separation distance* shall be of not less than 1-hour *fire-resistance-rated* construction, heavy timber construction, complying with Section 2304.11, *fire-retardant-treated wood* or as permitted by Section 705.2.3.1.

Exception: Type VB construction shall be allowed for combustible projections in Group R-3 and U occupancies with a *fire separation distance* greater than or equal to 5 feet (1524 mm).

705.2.3.1 Balconies and similar projections. Balconies, decks and similar building projections of combustible construction other than fire-retardant-treated wood shall be fire-resistance rated where required by Table 601 for floor construction or shall be of heavy timber construction in accordance with Section 2304.11. The aggregate length of the projections shall not exceed 50 percent of the building's perimeter on each floor.

Exceptions:

1. On buildings of Types 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 and plastic composites that comply with ASTM D7032 and Section 2612 are permitted for pickets, rails and similar guard components that are limited to 42 inches (1067 mm) in height.
3. Balconies, decks and similar projections on buildings of Types 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 or deck areas, the aggregate length of the balcony on each floor shall not be limited.

705.3 Buildings on the same lot. For the purposes of determining the required wall and opening protection, building projections and roof-covering requirements, buildings on the same lot shall be assumed to have an imaginary line between them.
Where a new building is to be erected on the same lot as an existing building, the location of the assumed imaginary line with relation to the existing building shall be such that the *exterior wall* and opening protection of the existing building meet the criteria as set forth in Sections 705.5 and 705.8.

Exceptions:

1. Two or more buildings on the same lot shall be either regulated as separate buildings or shall be considered as portions of one building if the aggregate area of such buildings is within the limits specified in Chapter 5 for a single building. Where the buildings contain different occupancy groups or are of different types of construction, the area shall be that allowed for the most restrictive occupancy or construction.
2. Where an S-2 parking garage of Construction Type I or IIA is erected on the same lot as a Group R-2 building, and there is no *fire separation distance* between these buildings, then the adjoining *exterior walls* between the buildings are permitted to have occupant use openings in accordance with Section 706.8. However, opening protectives in such openings shall only be required in the exterior wall of the S-2 parking garage, not in the exterior wall openings in the R-2 building, and these opening protectives in the exterior wall of the S-2 parking garage shall be not less than $1^1/_2$-hour *fire protection rating*.

Reason: The committee felt that a definition for building projections would be helpful in the administering of the code. We submitted a public comment and received opposition to the revised language. We have taken the comments from the committee hearing and the public comment hearing and created this proposal. There is quite a bit of confusion as to what a projection is. We have provided guidance and examples of what we feel are projections. The term unenclosed floors is intended to keep from having a upper story that is enclosed from being called a projection. Decks and balconies would be examples of unenclosed floors.
We have also changed the term 'Projection' to 'Building Projection" to differentiate this definition from other sections of the code that uses similar language. For example projection rooms and projections into ramps. It is not our intent to apply this definition to those sections of the code. The rest of the change involves coordinating the existing language with the new definition.

The fire characteristics are different for projections than they are for horizontal assemblies within a building. First there is no enclosed space above the projection. The second is that the heat and smoke from a fire under a projection will go up and then out to the atmosphere. The heat and smoke is not trapped within a room like it is within a building. That is why I believe projections are handled differently in the code.

The photo below is the porte cochere entry at the City Center project in Clark County, Nevada. The question is what is this structure. Is it a projection that is regulated by Section 705.2 or is a building element regulated by Table 601. That is the question I am trying to clarify in the code. This change would clarify that this structure would be a projection and would need to comply with Section 705.2

Cost Impact: The code change proposal will not increase or decrease the cost of construction This is a clarification of the current code.

FS15-18

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The proposal had merit but still had issues that need resolution. The definition should be refined. There needs to be a selection of term - architectural vs building. The issue of unenclosed elements needs to be better addressed. (Vote 9-5)

Assembly Action: **None**

FS15-18

Individual Consideration Agenda

Public Comment 1:

Proponent: Stephen Thomas, Colorado Code Consulting, LLC, representing Colorado Chapter ICC (sthomas@coloradocode.net)requests As Modified by This Public Comment.

Modify as follows:

2018 International Building Code

~~**BUILDING**~~ **ARCHITECTURAL PROJECTION.** ~~An unenclosed~~ A floor, roof or other appendage extending outward from and beyond the exterior wall of a building such as, but not limited to cornices, eave overhangs, exterior decks or balconies, porte cocheres and similar protrusions.

705.2 ~~Building~~ Architectural projections.~~.~~. ~~Building~~ Architectural projections shall conform to the requirements of this section and Section 1405. Exterior egress balconies and exterior exit stairways and ramps shall comply with Sections 1021 and 1027, respectively. ~~Building~~ Architectural projections shall not extend any closer to the line used to determine the *fire separation distance* than shown in Table 705.2.

Exception: Buildings on the same lot and considered as portions of one building in accordance with Section 705.3 are not required to comply with this section for projections between the buildings.

705.2.1 Types I and II construction. ~~Building~~ Architectural projections from walls of Type I or II construction shall be of noncombustible materials or combustible materials as allowed by Sections 705.2.3.1 and 705.2.4.

705.2.2 Type III, IV or V construction. ~~Building~~ Architectural projections from walls of Type III, IV or V construction shall be of any *approved* material.

705.2.3 Combustible ~~building~~ architectural projections. Combustible ~~building~~ architectural projections extending to within 5 feet (1524 mm) of the line used to determine the *fire separation distance* shall be of not less than 1-hour *fire-resistance-rated* construction, heavy timber construction, complying with Section 2304.11, *fire-retardant-treated wood* or as permitted by Section 705.2.3.1.

Exception: Type VB construction shall be allowed for combustible architectural projections in Group R-3 and U occupancies with a *fire separation distance* greater than or equal to 5 feet (1524 mm).

705.2.3.1 Balconies and similar architectural projections. Balconies, decks and similar ~~building~~ architectural projections of combustible construction other than fire-retardant-treated wood shall be fire-resistance rated where required by Table 601 for floor construction or shall be of heavy timber construction in accordance with Section 2304.11. The aggregate length of the architectural projections shall not exceed 50 percent of the building ~~'~~s perimeter on each floor.

Exceptions:

1. On buildings of Types 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 and plastic composites that comply with ASTM D7032 and Section 2612 are permitted for pickets, rails and similar guard components that are limited to 42 inches (1067 mm) in height.
3. Balconies, decks and similar projections on buildings of Types 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 or deck areas, the aggregate length of the balcony on each floor shall not be limited.

705.3 Buildings on the same lot. For the purposes of determining the required wall and opening protection, ~~building~~ architectural projections and roof-covering requirements, buildings on the same lot shall be assumed to have an imaginary line between them.
Where a new building is to be erected on the same lot as an existing building, the location of the assumed imaginary line with relation to the existing building shall be such that the *exterior wall* and opening protection of the existing building meet the criteria as set forth in Sections 705.5 and 705.8.

Exceptions:

1. Two or more buildings on the same lot shall be either regulated as separate buildings or shall be considered as portions of one building if the aggregate area of such buildings is within the limits specified in Chapter 5 for a single building. Where the buildings contain different occupancy groups or are of different types of construction, the area shall be that allowed for the most restrictive occupancy or construction.
2. Where an S-2 parking garage of Construction Type I or IIA is erected on the same lot as a Group R-2 building, and there is no *fire separation distance* between these buildings, then the adjoining *exterior walls* between the buildings are permitted to have occupant use openings in accordance with Section 706.8. However, opening protectives in such openings shall only be required in the exterior wall of the S-2 parking garage, not in the exterior wall openings in the R-2 building, and these opening protectives in the exterior wall of the S-2 parking garage shall be not less than $1^1/_2$-hour *fire protection rating*.

TABLE 705.2
MINIMUM DISTANCE OF ~~BUILDING~~ ARCHITECTURAL PROJECTION

FIRE SEPARATION DISTANCE-FSD (feet)	MINIMUM DISTANCE FROM LINE USED TO DETERMINE FSD
0 to less than 2	Projections not permitted
2 to less than 3	24 inches
3 to less than 5	24 inches plus 8 inches for every foot of FSD beyond 3 feet or fraction thereof
5 or greater	40 inches

For SI: 1 foot = 304.8 mm; 1 inch = 25.4 mm.

Commenter's Reason: The code needs to have a definition of a projection. There is too much confusion on what a projection is or is not. This proposal attempts to define what a projection is to make it easier for the user of the code. This public comment addresses the committee's comments during the Columbus hearings. We have changed the term Building Projection to Architectural Projection as requested throughout the code. There was also confusion on what we meant by unenclosed. So we have removed that term from the definition as well. The intent of the public comment is to just change the definition and no other technical requirements in the code. We believe the public comment addresses the Committee's concerns and reason for disapproval.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This is just a definition to clarify the code.

FS15-18

FS19-18

IBC: 705.6, 705.7

Proposed Change as Submitted

Proponent: Stephen Thomas, Colorado Code Consulting, LLC, representing Colorado Chapter ICC (sthomas@coloradocode.net)

2018 International Building Code

Add new text as follows

705.6 Continuity. The fire-resistance rating of exterior walls shall extend from the top of the foundation or floor/ceiling assembly below to one of the following:

1. The underside of the floor or roof sheathing, deck or slab above.
2. The underside of a floor/ceiling or roof/ceiling assembly having a fire-resistance rating that is not less than the fire-resistance rating of the exterior wall.

Parapets shall be provided as required by Section 705.11.

Revise as follows

~~**705.6**~~**705.7 Structural stability.** ~~*Exterior walls* shall extend to the height required by Section 705.11.~~ Interior structural elements that brace the exterior wall but that are not located within the plane of the exterior wall shall have the minimum *fire-resistance rating* required in Table 601 for that structural element. Structural elements that brace the exterior wall but are located outside of the exterior wall or within the plane of the exterior wall shall have the minimum *fire-resistance rating* required in Tables 601 and 602 for the exterior wall.

Reason: The current code language provides continuity language for other fire-resistant rated wall assemblies, but not exterior walls. Therefore, there is confusion in the design and construction community on how to build the exterior walls. The proposal provides such language and clarifies the intent of the code for exterior walls. The language is similar to that of a fire partition.
Current Section 705.6 includes language regarding parapets that really doesn't belong in a structural requirement. Therefore, we have relocated language regarding parapets to the new Section for Continuity. It is better located there.

Cost Impact: The code change proposal will decrease the cost of construction
The proposal will reduce the cost because the confusion will be eliminated and people will not be making things up.

FS19-18

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The proposal raised as many issues as it was solving on the topic of wall continuity. Is the continuity just for the wall, or does it include the foundation that might be exposed above grade? What is impact on floors which support the walls, do they need the same rating? (Vote 14-0)

Assembly Action: **None**

FS19-18

Individual Consideration Agenda

Public Comment 1:

Proponent: Stephen Thomas, Colorado Code Consulting, LLC, representing Colorado Chapter ICC (sthomas@coloradocode.net)requests As Modified by This Public Comment.

Modify as follows:

2018 International Building Code

705.6 Continuity. The fire-resistance rating of exterior walls shall extend from the top of the foundation or floor/ceiling assembly below to one of the following:

1. The underside of the floor or roof sheathing, deck or slab above.
2. ~~The~~ The underside of a one-hour fire-resistant rated floor/ceiling or roof/ceiling assembly~~ having a fire-resistance rating that is not less than the fire-resistance rating of the exterior wall~~.

Parapets shall be provided as required by Section 705.11.

705.7 Structural stability. Interior structural elements that brace the exterior wall but that are not located within the plane of the exterior wall shall have the minimum *fire-resistance rating* required in Table 601 for that structural element. Structural elements that brace the exterior wall but are located outside of the exterior wall or within the plane of the exterior wall shall have the minimum *fire-resistance rating* required in Tables 601 and 602 for the exterior wall.

Commenter's Reason: The IBC has continuity requirements for many different types of wall assemblies including fire walls, fire barriers, etc. However, there is no language for the continuity of exterior walls. This has created issues over the past few years as Type III Construction has become so popular. We had the same language issue with Type VA construction in the past, but it didn't seem to be a problem for many people. The original intent of our proposal was to clarify the continuity requirements for exterior walls. This public comment is intended to provide a more reasonable requirement than the original proposal. It requires fire-resistant rated exterior walls to either continue to the underside of the floor sheathing or to the bottom of a one-hour fire-resistant rated floor/ceiling or roof/ceiling assembly.
The extension to the fire-resistant rated horizontal assembly is consistent with the AWC Pamphlet DCA-3 on Fire-Resistance-Rated Wood-Frame Wall and Floor/Ceiling Assemblies. The document provides several tested assemblies where the floor systems are one-hour fire-resistant rated. We believe this is sufficient protection of the floor framing located at the exterior wall plane.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This is intended to be a clarification of the code requirements.

FS19-18

FS20-18

IBC: 202 (New), 705.6.1 (New), 707.5.2 (New)

Proposed Change as Submitted

Proponent: Paul Coats, American Wood Council, representing American Wood Council (pcoats@awc.org)

2018 International Building Code

SECTION 202 DEFINITIONS

Add new definition as follows

PLATFORM CONSTRUCTION. A system of construction where the floor structure is supported by the bearing exterior and interior walls below, and supports the exterior walls and interior partitions above it.

SECTION 705 EXTERIOR WALLS

Add new text as follows

705.6.1 Platform framing. Where floors connect to exterior walls in platform construction, the structural framing shall be protected at the intersection to maintain the continuity of the fire-resistance rating required of the wall, as required by Section 704.1. The fire-resistance rating shall be maintained through the use of materials permitted by the type of construction, but not limited to, one or more of the following: the ceiling membrane, solid blocking, solid wood elements, the rim board, protection by noncombustible materials, or other features or protection deemed to achieve the required fire-resistance rating. The requirements of Section 703.2.5 and 705.7 shall apply. The material requirements for the portion of the floor in the plane of the exterior wall shall be as for floor construction in accordance with the type of construction.

SECTION 707 FIRE BARRIERS

707.5.2 Platform framing. Where floors or roofs connect to fire barriers in platform construction, the structural framing shall be protected at the intersection to maintain the continuity of the required fire resistance rating for the fire barrier, and the support of the fire barrier in accordance with Section 704.1. The fire-resistance rating shall be maintained through the use of materials permitted by the type of construction, including but not limited to, one or more of the following: solid blocking, solid wood elements, the rim board, protection by noncombustible materials, or other features or protection deemed to achieve the required fire-resistance rating.

Reason: This code change provides improved continuity of protection when exterior walls and fire barriers intersect with floors in buildings using platform construction.
Ratings required for exterior walls by either Table 602 or Table 601 may be greater than the rating required for the floors. As a result, questions arise about the protection of the wall/floor intersection in platform construction where differently rated elements come together. The protection of the intersection should be in accordance with the underlying principles of continuity and support for the rated wall construction. There are many practical solutions being used currently that would comply with this proposed code change. They involve the use of solid wood blocking or other protection to provide the continuity in fire resistance rating for the construction supporting the wall. AWC has developed details that may be approved by the code official for the exterior wall/floor intersection which can be found in the AWC Design for Code Acceptance (DCA) No. 3, Fire Rated Wood Wall and Floor Assemblies. They can be viewed and downloaded here: http://awc.org/codes-standards/publications/dca3. Link established 2.21.18.

The same questions arise for platform-framed fire barriers protecting shafts and interior stair enclosures, which often are required to be two-hour rated while the supporting floor construction is one-hour, therefore similar provisions were added to 707.5 for fire barriers.

Fire retardant treated wood (FRTW) is permitted for exterior walls of Type III and IV construction. Some code officials have required the floor construction in the plane of the exterior wall (the end of the floor in platform construction) to be FRTW, which is costly and burdensome and provides very little safety advantage since the intersection is already protected by FRTW or noncombustible cladding on the exterior. The proposal clarifies that for exterior wall intersections, the elements of the floor construction (joists, rim board, floor sheathing, and blocking if used) can be in accordance with the materials requirements for floors. The cladding component of the wall would need to be fire retardant treated or noncombustible as for the exterior wall framing itself.

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

There are a variety of current interpretations and applications for fire resistance in platform construction involving exterior walls and fire barriers. This proposed change may slightly reduce or slightly increase construction costs, depending on the current approach of individual jurisdictions.

FS20-18

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: This is so specific to wood construction that there will be unintended consequences for other materials. Language is confusing and would be difficult to enforce. Introducing wood into a non-combustible wood changes the nature of that wall. This needs refinement before it clearly address the issues raised by the opponents. (Vote 13-1)

Assembly Action: **None**

FS20-18

Individual Consideration Agenda

Public Comment 1:

Proponent: James Smith, American Wood Council, representing American Wood Council (jsmith@awc.org); Paul Coats, American Wood Council, representing American Wood Council (pcoats@awc.org); SAM W FRANCIS, AWC, representing AWC (sfrancis@awc.org)requests As Modified by This Public Comment.

Replace as follows:

2018 International Building Code

705.6 Structural stability. *Exterior walls* shall extend to the height required by Section 705.11. Interior structural elements that brace the exterior wall but that are not located within the plane of the exterior wall shall have the minimum *fire-resistance rating* required in Table 601 for that structural element. Structural elements that brace the exterior wall but are located outside of the exterior wall or within the plane of the exterior wall shall have the minimum *fire-resistance rating* required in Tables 601 and 602 for the exterior wall. The supporting construction needed to provide vertical support of the exterior wall shall be protected to afford the required fire resistance of the wall being supported.

Commenter's Reason: Our original proposal included modifications dealing with both the materials used in the exterior walls (the FRT wood exception) and the fire resistive integrity (the 2-hour rating) of horizontal building elements (floors) that support the walls. The committee disapproved the proposal because, among other things, they felt the language was confusing and, for that reason, difficult to enforce. They indicated the proposal needed refinement to more clearly address the issues raised by the opponents. In an effort to provide that clarity, we have chosen to submit two separate PC s: one comment on the materials and this comment dealing with only the fire resistive integrity.
Some jurisdictions have prohibited traditional platform construction details in attempts to enhance the fire resistance continuity of exterior walls, requiring alternative connections that may actually decrease fire safety for building occupants. Though well intentioned, alternative connections that protect the exterior wall end up sacrificing the inherent strength of the platform intersection for both structural and fire performance. We believe this pared-back public comment still makes it clear that floors can support exterior walls per traditional platform design without jeopardizing the fire performance of the building, and that the fire resistance of the intersection will be maintained.

In our effort to maintain clarity while also keeping it simple we chose language that is already in use and familiar to code officials. That similar language can be found in sections 707.5.1, 709.4, 711.2, 712.1.15 & 716.3.3.1 of the IBC.

The American Wood Council has published fire resistance guidelines for the materials used for the fire resistance of traditional platform construction in Design for Code Acceptance No. 3, Fire-Resistance-Rated Wood-Frame Wall and Floor/Ceiling Assemblies, which can be downloaded here: http://www.awc.org/codes-standards/publications/dca3. Although not referenced standards, the Design for Code Acceptance (DCA) series of AWC documents are intended to assist users of the codes and our standards in understanding how the codes and standards can be used together to meet the intent of the code. We included the link to DCA 3 within this reason statement for use as a tool that we feel will help those considering this public comment understand how this complicated issue can be satisfied with our proposed simplified language.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
The public comment clarifies what the code already requires, and therefore there is no increase or decrease of construction costs.

Public Comment 2:

Proponent: Paul Coats, PE, CBO, American Wood Council, representing American Wood Council (pcoats@awc.org)requests As Modified by This Public Comment.

Replace as follows:

2018 International Building Code

705.4 Materials. *Exterior walls* shall be of materials permitted by the building type of construction. The material requirements for portions of floor or roof assemblies in the plane of the exterior wall shall be as required for interior building elements according to the building type of construction.

Commenter's Reason: The original proposal included modifications dealing with both the materials issues and the continuity of the fire resistance of the floor/wall intersection in platform construction. In response to committee concerns, we have submitted two simplified public comments: one public comment on the fire resistance issue and this one dealing with only the materials question.
Some jurisdictions have required floor or roof elements that intersect with the exterior wall to comply with the materials requirements for the wall. For instance, in Type III platform construction where the exterior walls are fire retardant treated wood (FRTW), some jurisdictions have required the floor sheathing, floor joists, or rim board to be fire retardant treated wood where they extend into the plane of the exterior wall. This is impractical and costly in relation to any real safety benefit.

The requirement for FRTW addresses ignition resistance and flame spread in the exterior wall, and FRTW in the floor adds nothing to the fire resistance of the intersection, which can be provided by any number of means. It seems practical that as long as the wood elements germane to the wall are FRTW (such as studs, sills, plates, exterior wall sheathing, etc.), and the ends of floors or roofs are protected for the required fire resistance when supporting the exterior wall (rim boards, floor or roof sheathing, joists and rafters, etc.), the intent of the code is met. The use of the words "interior building elements" in this public comment means floor or roof assemblies in the same way that Section 602.3 refers to "interior building elements" as being interior to the exterior walls. This public comment is consistent with common interpretations regarding materials requirements for floors and roofs in Type III construction.

The American Wood Council has published fire resistance guidelines for the materials and fire resistance of traditional platform construction in Design for Code Acceptance No. 3, Fire-Resistance-Rated Wood-Frame Wall and Floor/Ceiling Assemblies, which can be downloaded here: http://www.awc.org/codes-standards/publications/dca3.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
Because floor and roof structures are not currently required to comply with materials requirements for walls, this is a clarification of current requirements and will not increase or decrease the cost of construction.

FS20-18

FS21-18

IBC: 705.10

Proposed Change as Submitted

Proponent: Michael O'Brian, Chair, representing FCAC (fcac@iccsafe.org)

2018 International Building Code

Add new text as follows

705.10 Penetrations. Penetrations of exterior walls required by this section to have a fire-resistance rating shall comply with Section 714.

Exception: Penetrations in exterior walls that are permitted to have unprotected openings.

Reason: Protection of penetrations through fire-resistance-rated assemblies is a fundamental feature of compartmentation and the need to prevent fire and smoke spread. The IBC requires penetrations to be protected in fire walls (706.9), fire barriers (707.7), fire partitions (708.7), smoke barriers (709.6), smoke partitions (710.6), and vertical openings (712.1.4). The IBC distinguishes between openings and penetrations. In the context of IBC section 705.8, openings are not penetrations. So in the IBC, exterior wall penetrations (e.g. for pipes, ducts, and other services) do not require opening protectives. They are separate and distinct. Consequently, the IBC does not require protection of through-penetrations through exterior walls, even when they are fire-resistance-rated, and regardless of the limiting distance. Conversely, joints in exterior walls are already required to be protected in Section 705.9, and ducts & air transfer openings are required to be protected in Section 705.10.
The IBC does not currently limit the size, type, or number of unprotected penetrations in exterior walls. Tables 601 and 602 require exterior walls to have a fire-resistance rating under some circumstances. Further, Chapter 7 also requires fire rated opening protectives, rated joints, and ducts and transfer openings to be protected depending upon the limiting distance. This proposal would treat penetrations through rated exterior walls in the same manner as fire-resistant joints in exterior walls. It would require penetrations in exterior walls to be firestopped only when protected openings are required based on Chapter 6 and Chapter 7 limiting distance requirements.

This proposal is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire safety and hazardous materials in new and existing buildings and facilities and the protection of life and property in wildland urban interface areas. In 2017 the Fire-CAC has held 3 open meetings. In addition, there were numerous conference calls, Regional Work Group and Task Group meetings for the current code development cycle, which included members of the committees as well as any interested parties, to discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: https://www.iccsafe.org/codes-tech-support/cs/fire-code-action-committee-fcac/

Cost Impact: The code change proposal will increase the cost of construction
Where unprotected openings are not permitted, penetrations which could previously be left unprotected will now require protection in accordance with Section 714.

FS21-18

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: No history of building to building fires resulting from small 'penetrations'. Creates a lot of design problems without providing clear solutions. Section 714 is clear, the solutions should be there. There is support for regulating penetrations. After a certain distance there can be unrated openings. The proposal was unclear how this threshold of allowing unrated openings works with this proposal. (Vote 9-4)

Assembly Action: **None**

FS21-18

Individual Consideration Agenda

Public Comment 1:

Proponent: Michael O'Brian, FCAC, representing FCAC (fcac@iccsafe.org)requests As Modified by This Public Comment.

Further modify as follows:

2018 International Building Code

714.4 Fire-resistance-rated walls. Penetrations into or through exterior walls, *fire walls*, *fire barriers*, *smoke barrier* walls and *fire partitions* shall comply with Sections 714.4.1 through 714.4.3. Penetrations in *smoke barrier* walls shall also comply with Section 714.5.4.

Commenter's Reason: The intent of this proposal is to add a new requirement to protect penetrations in exterior wall in the same manner as the existing requirements to protect joints, openings, and duct and air transfer openings in exterior walls. New Section 705.10 was developed to accomplish that goal. The intent was subsequent sections would be renumbered.
During the Committee Action Hearings, the Fire Safety Committee rightfully pointed out that FS21-18 failed to update Section 714.4 to add exterior walls to the list of wall types where the protection of penetrations is required. This Public Comment corrects that oversight.

The Fire Safety Committee also questioned the threshold at which penetrations need to be protected. The threshold is stated in the Exception in exactly the same manner as currently specified for Joints in Section 707.9. If unprotected openings are permitted by Table 705.8, then penetrations do not require protection.

During testimony on FS21-18, confusion arose between the new proposed requirement for penetrations and existing Section 705.10 covering the protection of ducts and air transfer opening. That confusion resulted from 1) the new provision covering penetrations was identified as Section 705.10 as was the existing provision for ducts and air transfer openings, and 2) both provisions used the word penetrations . Just to be clear, the new requirement for penetrations relates to Section 714 whereas the existing requirement for ducts and air transfer openings relates to Section 717.

In an effort to respond to the Committee s comments, we are offering two Public Comments. Public Comment 1 accomplishes the following:

> Updates Section 714.4 to include exterior walls as requested by the Committee.
> Changes the Section Number of the new requirement covering penetrations so as to avoid confusion with the existing section covering ducts and air transfer openings.

Public Comment 2 accomplishes the following:

> Eliminates the words Penetrations by from the existing Section 705.10 covering ducts and air transfer openings.
> Changes the Section Number of the new requirements covering penetrations so as to avoid confusion with the existing section covering ducts and air transfer openings.
> Renumbers the existing Section 705.10 in recognition of the addition of the new provision relating to penetrations.

Public Comment 1 is essential to provide a technically viable code change. Public Comment 2 provides additional clarity to differentiate a penetration from a duct and air transfer opening, but is not essential to the proposal. Through the voting process the membership can decide whether only Public Comment 1 is needed or whether the additional clarity provided by Public Comment 2 is desirable.

This public comment is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire safety and hazardous materials in new and existing buildings and facilities and the protection of life and property in wildland urban interface areas. In 2017 the Fire-CAC has held 3 open meetings and in 2018 FCAC held 2 open meetings. In addition, there were numerous conference calls, Regional Work Group and Task Group meetings for the current code development cycle, which included members of the committees as well as any interested parties, to discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: https://www.iccsafe.org/codes-tech-support/cs/fire-code-action-committee-fcac/

Cost Impact: The net effect of the public comment and code change proposal will increase the cost of construction Where unprotected openings are not permitted, penetrations which could previously be left unprotected will now require protection in accordance with Section 714.

Public Comment 2:

Proponent: Michael O'Brian, FCAC, representing FCAC (fcac@iccsafe.org)requests As Modified by This Public Comment.

Further modify as follows:

2018 International Building Code

705.~~10~~9 Penetrations. Penetrations of exterior walls required by this section to have a fire-resistance rating shall comply with Section 714.

Exception: Penetrations in exterior walls that are permitted to have unprotected openings.

705.~~9~~10 Joints. Joints made in or between *exterior walls* required by this section to have a *fire-resistance rating* shall comply with Section 715.

Exception: Joints in *exterior walls* that are permitted to have unprotected openings.

705.~~9~~10.1 Voids. The void created at the intersection of a floor/ceiling assembly and an exterior curtain wall assembly shall be protected in accordance with Section 715.4.

705.~~10~~11 Ducts and air transfer openings. ~~Penetrations by air~~ Air ducts and air transfer openings in fire-resistance-rated *exterior walls* required to have protected openings shall comply with Section 717.

Exception: Foundation vents installed in accordance with this code are permitted.

Commenter's Reason: The reason statement for Public Comment 1 recaps the intent of this proposal, the Fire Safety Committee's comments during the Committee Action Hearing and intent of the two Public Comments being proposed. Public Comment 1 is essential to provide a technically viable code change. Public Comment 2 provides additional clarity to differentiate a penetration from a duct and air transfer opening, but is not essential to the proposal. Through the voting process the membership can decide whether only Public Comment 1 is needed or whether the additional clarity provided by Public Comment 2 is desirable.
This public comment is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire safety and hazardous materials in new and existing buildings and facilities and the protection of life and property in wildland urban interface areas. In 2017 the Fire-CAC has held 3 open meetings and in 2018 FCAC held 2 open meetings. In addition, there were numerous conference calls, Regional Work Group and Task Group meetings for the current code development cycle, which included members of the committees as well as any interested parties, to discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: https://www.iccsafe.org/codes-tech-support/cs/fire-code-action-committee-fcac/

Cost Impact: The net effect of the public comment and code change proposal will increase the cost of construction Where unprotected openings are not permitted, penetrations which could previously be left unprotected will now require protection in accordance with Section 714.

FS21-18

FS22-18

IBC: 706.1.1

Proposed Change as Submitted

Proponent: Jeffrey Shapiro, representing Self (jeff.shapiro@intlcodeconsultants.com)

2018 International Building Code

Revise as follows

706.1.1 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 *fire wall* in accordance with Section 706. Party walls shall be constructed without openings and shall create separate buildings.

Exceptions:

1. Openings in a party wall separating an *anchor building* and a mall shall be in accordance with Section 402.4.2.2.1.
2. ~~Fire~~ Party walls and fire walls are not required on lot lines dividing a building for ownership purposes where the aggregate height and area of the portions of the building located on both sides of the lot line do not exceed the maximum height and area requirements of this code. For the code official's review and approval, he or she shall be provided with copies of dedicated access easements and contractual agreements that permit the owners of portions of the building located on either side of the lot line access to the other side for purposes of maintaining fire and life safety systems necessary for the operation of the building.

Reason: This section mixes use of the terms fire wall and party wall, and both should be mentioned in Exception 2 to make it clear that walls constructed in accordance with Exception 2 are allowed to have penetrations in accordance with the restrictions stated in the exception.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Intended as a clarification of existing provisions.

FS22-18

Public Hearing Results

Committee Action: **As Submitted**

Committee Reason: The intent of the section is clearer with the added text. (Vote 9-5.)

Assembly Action: **None**

FS22-18

Individual Consideration Agenda

Public Comment 1:

Proponent: Gregory Keith, representing The Boeing Company (grkeith@mac.com)requests As Modified by This Public Comment.

Modify as follows:

2018 International Building Code

706.1.1 Party walls. ~~Any~~ A party wall is any wall located on a *lot line* between adjacent buildings, which is used or adapted for joint service between the two buildings ~~,~~ and shall be constructed as a *fire wall* in accordance with Section 706. Party walls shall be constructed without openings and shall create separate buildings.

Exceptions:

1. Openings in a party wall separating an *anchor building* and a mall shall be in accordance with Section 402.4.2.2.1.
2. Party ~~walls and fire~~ walls are not required on lot lines dividing a building for ownership purposes where the aggregate height and area of the portions of the building located on both sides of the lot line do not exceed the maximum height and area requirements of this code. For the code official ~~'~~s review and approval, he or she shall be provided with copies of dedicated access easements and contractual agreements that permit the owners of portions of the building located on either side of the lot line access to the other side for purposes of maintaining fire and life safety systems necessary for the operation of the building.

Commenter's Reason: In the proponent's reason statement he notes, This section mixes use of the terms fire wall and party wall... He goes on to say that, ...walls constructed in accordance with Exception 2 are allowed to have penetrations... He is correct that the terms "party wall" and "fire wall" are mixed in Section 706.1.1. Since Section 706.1.1 is titled Party walls, the fix is to delete the term fire wall in Exception 2. His concern about allowance for penetrations (and openings) is not necessary. Exception 2 states that party walls are not required under prescribed ownership conditions. Accordingly, if there is no party wall, there are no openings or penetrations to protect.
In addition to deleting the term fire wall from Exception 2, Section 706.1.1 has been clarified to provide for an implied definition of party wall.

The original proposal confused the construction requirements for party walls and further confusion could result if a code practitioner was looking to the published reason statement to provide logic for the code change. This public comment clarifies the provision while addressing the proponent's original concern.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This public comment is essentially editorial in nature.

FS22-18

FS23-18

IBC: 706.5, 706.5.1, 706.5.2

Proposed Change as Submitted

Proponent: Ronald Clements Jr, representing Chesterfield County Building Inspection Department (clementsro@chesterfield.gov)

2018 International Building Code

Revise as follows

706.5 Horizontal continuity. *Fire walls* shall be continuous from *exterior wall* to *exterior wall* and shall terminate in accordance with this section ~~extend not less than 18 inches (457 mm) beyond the exterior surface of *exterior walls*.~~

~~**Exceptions:**~~

~~1. Fire walls shall be permitted to terminate at the interior surface of combustible exterior sheathing or siding provided that the exterior wallhas a fire-resistance rating of not less than 1 hour for a horizontal distance of not less than 4 feet (1220 mm) on both sides of the fire wall. Openings within such exterior walls shall be protected by opening protectives having a fire protection rating of not less than $^{3}/_{4}$ hour.~~

~~2. *Fire walls* shall be permitted to terminate at the interior surface of noncombustible exterior sheathing, exterior siding or other noncombustible exterior finishes provided that the sheathing, siding or other exterior noncombustible finish extends a horizontal distance of not less than 4 feet (1220 mm) on both sides of the *fire wall*.~~

~~3. *Fire walls* shall be permitted to terminate at the interior surface of noncombustible exterior sheathing where the building on each side of the *fire wall* is protected by an *automatic sprinkler system* installed in accordance with Section 903.3.1.1 or 903.3.1.2.~~

Add new text as follows

706.5.1 Termination at 180 degree or greater exterior wall angle. Where the angle between the exterior walls on either side of the fire wall is equal to or greater than 180 degrees (3.14 rad), the fire wall termination shall comply with one of the following:

1. The fire wall shall terminate at the interior surface of any exterior sheathing or siding permitted by this code provided that the exterior wall has a fire-resistance rating of not less than 1 hour for a horizontal distance of not less than 4 feet (1220 mm) on both sides of the fire wall. Openings within such exterior walls within 4 feet (1220 mm) of the fire wall shall be protected by opening protectives having a fire protection rating of not less than ¾ hour.
2. The fire wall shall terminate at the interior surface of noncombustible exterior sheathing with non-combustible exterior siding or other noncombustible exterior finishes provided that the non-combustible sheathing and siding or other exterior noncombustible finish extends a horizontal distance of not less than 4 feet (1220 mm) on both sides of the fire wall. Openings within such exterior walls within 4 feet (1220 mm) of the fire wall shall be protected by opening protectives having a fire protection rating of not less than ¾ hour.
3. The fire wall shall terminate at the interior surface of noncombustible exterior sheathing with any siding or exterior finish materials permitted by this code provided that the non-combustible sheathing extends a horizontal distance of not less than 4 feet (1220 mm) on both sides of the fire wall and the buildings on each side of the fire wall are protected by an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2. Openings within such exterior walls within 4 feet (1220 mm) of the fire wall shall be protected by opening protectives having a fire protection rating of not less than ¾ hour.
4. The fire wall shall terminate at the interior surface of masonry or concrete exterior walls where the masonry or concrete exterior walls extend a horizontal distance of not less than 4 feet (1220 mm) on both sides of the fire wall. Openings within such exterior walls within 4 feet (1220 mm) of the fire wall shall be protected by opening protectives having a fire protection rating of not less than ¾ hour.
5. The fire wall shall terminate at the interior surface of any exterior sheathing or siding permitted by this code provided the buildings on each side of the fire wall are protected by an automatic sprinkler system installed in accordance with Section 903.3.1.1.
6. The fire wall shall extend not less than 18inches (457 mm) beyond the exterior surface of the exterior wall.

706.5.2 Termination at less than 180 degree exterior wall angle. Where the angle between the exterior walls on either side of the fire wall, within 4 feet (1220 mm)of the fire wall, is less than 180 degrees (3.14 rad), the fire wall termination shall extend to the plane of the exterior sheathing or surface of one of the exterior walls on either side of the fire wall. An imaginary line shall be established extending out from the fire wall termination point between the exterior walls on both sides of the fire wall for the purpose of establishing the fire separation distance for the exterior walls. The fire-resistance rating and opening protection requirements for the exterior walls shall meet Sections 705.5 and 705.8 based on the fire separation distance established by the imaginary line.

Delete without substitution

~~**706.5.1 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 $^3/_4$-hour protection where opening protection is required by Section 705.8. The *fire-resistance rating* of the *exterior wall* shall extend not less than 4 feet (1220 mm) on each side of the intersection of the *fire wall* 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 *fire wall* shall assume to have an imaginary *lot line* at the *fire wall* and extending beyond the exterior of the *fire wall*. The location of the assumed line in relation to the *exterior walls* and the *fire wall* shall be such that the *exterior wall* and opening protection meet the requirements set forth in Sections 705.5 and 705.8. 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).~~

Reason: The fire wall horizontal termination provisions are set up with section 706.5 providing the termination methods for firewall terminations where the exterior walls on either side are at an angle of 180 degrees or greater and section 706.5.1 providing the termination methods for fire wall termination where the exterior walls on either side are at an angle less than 180. 706.5.1 is an additional requirement, when the angle is less than 180, to the base requirement in 706.5. This does not work in practice. If a fire wall terminates at the vertex of a 90 degree angle between the two exterior walls on either side the fire wall cannot extend 18 inches beyond the surface of the exterior wall nor can the fire wall extend to the surface of the exterior sheathing so the sections cannot build on one another. Section 706.5.1 refers to conditions when a fire wall intersects the exterior wall. Geometrically an intersection is a point common to two lines so the condition detailed in 706.5 for a 180 termination is an intersection of the exterior wall by the fire wall so one could argue that the last sentence of 706.5.1 items 1 and 2 override the requirements of 706.5 when the exterior walls are at 180 to each other. That is not the intent. This code change fixes the problem by separating out the termination requirements based on the angle between the exterior walls. The 706.5.1 method applies when the angle between exterior walls is 180 degrees or greater and the 706.5.2 method applies when the angle between exterior walls is less than 180 degrees. Additionally the base requirement for the 18" extension is the exception, not the rule, so the exceptions have been re-organized into options and the 18 inch exception is now another option. The termination methods that allow termination at sheathing have opening protection requirements added since the code is currently silent on this fact. Current code would allow the entire 4 foot to be open. New option 4 was added to allow termination of the fire wall at an exterior masonry or concrete wall, this is currently not addressed. New option 5 was added to allow for a full NFPA 13 sprinkler to count as equivalent to 4 feet on non-combustible siding.

Section 706.5.2 addresses the firewall termination where the exterior walls on either side are at an angle less than 180 degrees. The first exception was removed because it makes no sense to allow this method when it would not be allowed if the buildings were separated by an inch. If two adjacent buildings are separated and joined by a fire wall and they have exterior walls that are exposed to each other at angles less than 180 degrees they should be treated as separate buildings for exposure purposes just as any two separate buildings would be treated. Current exception 1 gives you a less restrictive method when the building are touching; that makes no sense. The imaginary line exception is now a single requirement. The section was also cleaned up so it is clear how to apply the imaginary line. The current text literally states that the wall itself will assume to have an imaginary line. Walls cannot assume things. The current text also does not clearly state that the imaginary line is to be used to establish fire separation distances. Since that is not provided based on current text there is no protection requirement because section 705.5 and 705.8 are based on fire separation distance defined in chapter 2.

Example of less than 180 termination

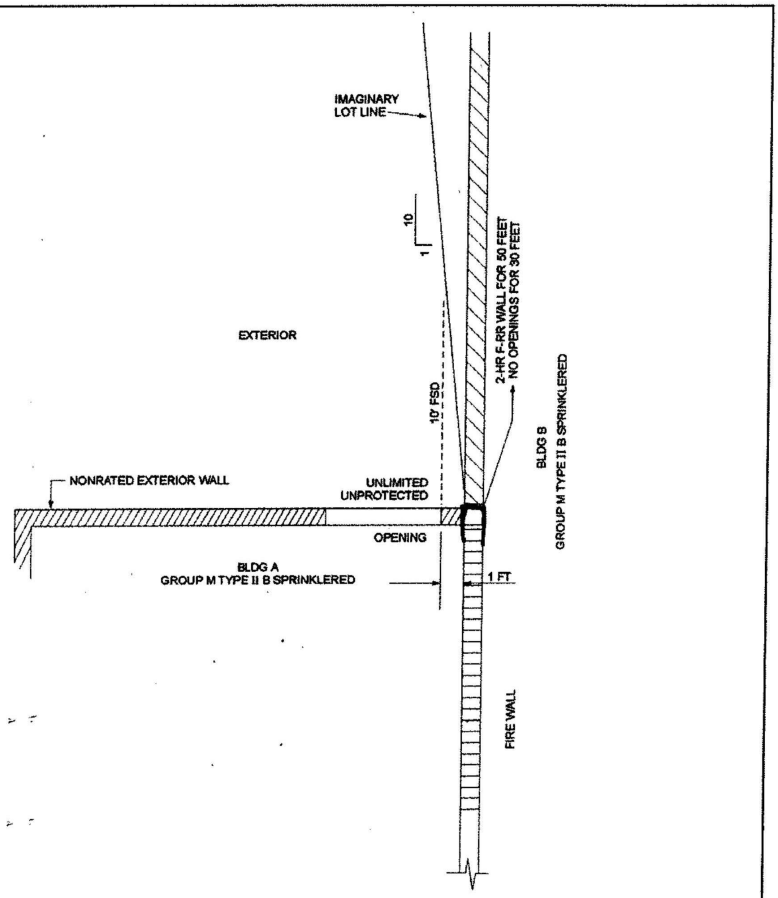


Figure 706.5.1(3)
EXAMPLE OF METHOD 2

2012 INTERNATIONAL BUILDING CODE© COMMENTARY 7-35

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This is a clarifying code change.

FS23-18

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The committee felt that the current text is clear and doesn't need change. The proposed text is confusing (Vote 14-0)

Assembly Action: **None**

FS23-18

Individual Consideration Agenda

Public Comment 1:

Proponent: Ronald Clements Jr, representing Chesterfield County Building Inspection Department (clementsro@chesterfield.gov)requests As Modified by This Public Comment.

Modify as follows:

2018 International Building Code

706.5.1 Termination at 180 degree or greater exterior wall angle. Where the angle between the exterior walls on either side of the fire wall is equal to or greater than 180 degrees (3.14 rad), the fire wall termination shall comply with one of the following:

1. The fire wall shall terminate at the interior surface of any exterior sheathing or siding permitted by this code provided that the exterior wall has a fire-resistance rating of not less than 1 hour for a horizontal distance of not less than 4 feet (1220 mm) on both sides of the fire wall. Openings within such exterior walls within 4 feet (1220 mm) of the fire wall shall be protected by opening protectives having a fire protection rating of not less than 3/4 hour.
2. The fire wall shall terminate at the interior surface of noncombustible exterior sheathing with non-combustible exterior siding or other noncombustible exterior finishes provided that the non-combustible sheathing and siding or other exterior noncombustible finish extends a horizontal distance of not less than 4 feet (1220 mm) on both sides of the fire wall. Openings within such exterior walls within 4 feet (1220 mm) of the fire wall shall be protected by opening protectives having a fire protection rating of not less than 3/4 hour.
3. The fire wall shall terminate at the interior surface of noncombustible exterior sheathing with any siding or exterior finish materials permitted by this code provided that the non-combustible sheathing extends a horizontal distance of not less than 4 feet (1220 mm) on both sides of the fire wall and the buildings on each side of the fire wall are protected by an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2. Openings within such exterior walls within 4 feet (1220 mm) of the fire wall shall be protected by opening protectives having a fire protection rating of not less than 3/4 hour.
4. The fire wall shall terminate at the interior surface of masonry or concrete exterior walls where the masonry or concrete exterior walls extend a horizontal distance of not less than 4 feet (1220 mm) on both sides of the fire wall. Openings within such exterior walls within 4 feet (1220 mm) of the fire wall shall be protected by opening protectives having a fire protection rating of not less than 3/4 hour.
5. ~~The fire wall shall terminate at the interior surface of any exterior sheathing or siding permitted by this code provided the buildings on each side of the fire wall are protected by an automatic sprinkler system installed in accordance with Section 903.3.1.1.~~
6. The fire wall shall extend not less than 18inches (457 mm) beyond the exterior surface of the exterior wall.

706.5.2 Termination at less than 180 degree exterior wall angle. Where the angle between the exterior walls on either side of the fire wall, within 4 feet (1220 mm)of the fire wall, is less than 180 degrees (3.14 rad), the fire wall termination shall extend to the plane of the outermost exterior wall sheathing or surface of one of the exterior walls on either side of the fire wall. An imaginary line shall be established extending out from the fire wall termination point between the exterior walls on both sides of the fire wall for the purpose of establishing the fire separation distance for the exterior walls. The fire-resistance rating and opening protection requirements for the exterior walls shall meet Sections 705.5 and 705.8 based on the fire separation distance established by the imaginary line.

Commenter's Reason: The original code change has a very detailed and technically sound reason statement that fully explains why this code change is needed both to address structural issues with text and section organization, and to correct technical issues with the code provisions. No individual, organization or industry spoke in opposition to the code

change. The committee did not provide any technical justification for their action to deny the code change.
Regarding the modification proposed, Steve Skalko representing MACS suggested two minor modifications to proposed section 706.5.1 exception #5 and section 706.5.2. Exception #5 is a new exception so to simplify the code change and address Steve's issue my modification removes exception #5, simplifying the code change. Section 706.5.2 has been clarified to address the condition where the exterior walls on either side of the fire wall termination point are offset; with the revised text it is clear that the fire wall terminates at the outermost of the two offset walls.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
See original.

FS23-18

FS24-18

IBC: 706.6.1

Proposed Change as Submitted

Proponent: Lee Kranz, representing Washington Association of Building Officials Technical Code Development Committee (lkranz@bellevuewa.gov)

2018 International Building Code

Revise as follows

706.6.1 Stepped buildings. Where a *fire wall* also serves as an *exterior wall* for a building and separates buildings having different roof levels, such wall shall terminate at a point not less than 30 inches (762 mm) above the lower roof ~~level, provided the *exterior wall* for a height of 15 feet (4572 mm)~~ level. Exterior walls above the fire wall extending more than 30 inches (762 mm) above the lower roof ~~is~~ shall be of not less than 1-hour fire-resistance-rated construction from both sides with openings protected by fire assemblies having a *fire protection rating* of not less than $^3/_4$ hour. Portions of the exterior walls greater than 15 feet (4572 mm) above the lower roof shall be of non-fire-resistance rated construction unless otherwise rated construction is required by other provisions of this code.

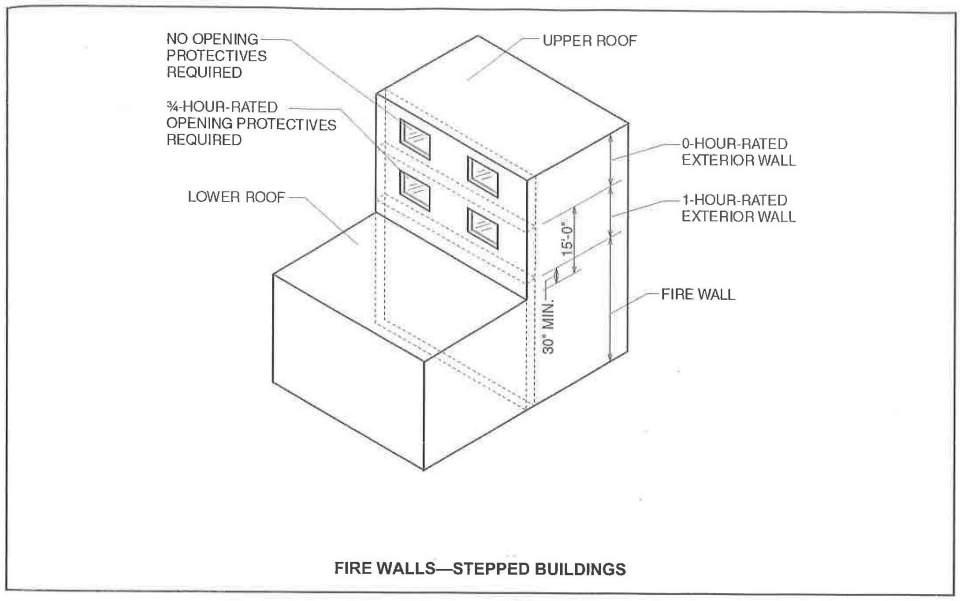
Exception: ~~Where the~~ A *fire wall* ~~terminates~~ serving as part of an exterior wall for a building that separates buildings having different roof levels shall be permitted to terminate at the underside of the roof sheathing, deck or slab of the lower roof, provided ~~that~~all of the following requirements are met:

1. The lower roof assembly within 10 feet (3048 mm) of the fire wall has not less than a 1-hour *fire-resistance*

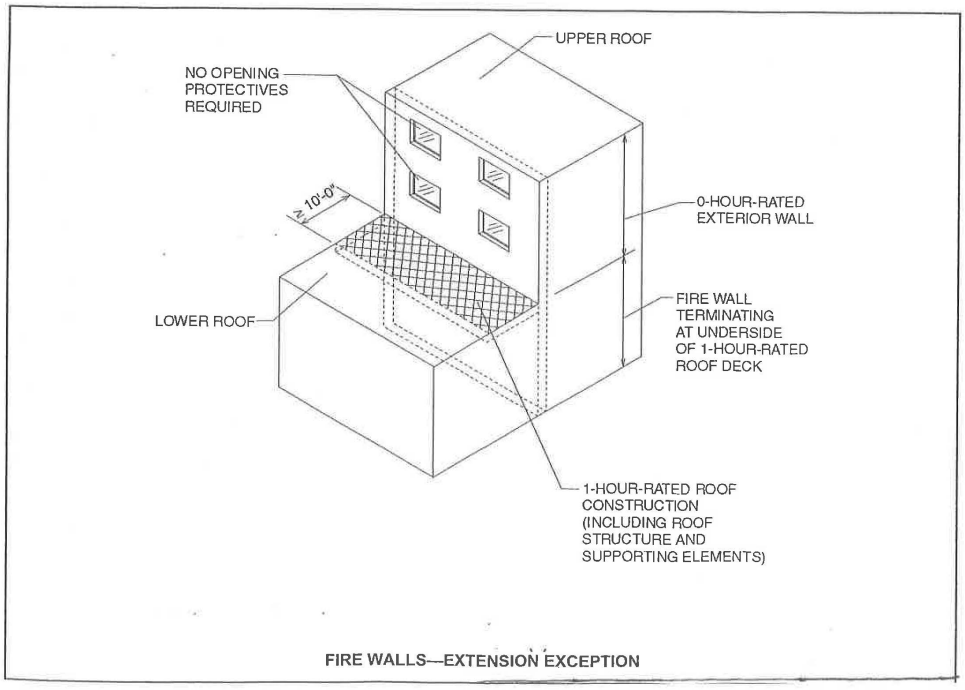
   rating. and the
2. The entire length and span of supporting elements for the rated roof assembly

   ~~has~~ shall have a *fire-resistance rating* of not less than 1-hour.
~~2.~~3. Openings in the lower roof shall not be located within 10 feet (3048 mm) of the *fire wall*.
4. 1-hour fire- resistance rated exterior wall protection above the lower roof, as specified in this section, is not required unless fire resistance rated construction is required by other provisions of this

Reason: Section 706.6.1 is confusing as currently written. It is intended to regulate the design of fire walls and exterior walls above and in-line with the fire walls for buildings having stepped roof levels. The intent of this section is to maintain adequate separation between the two portions of the same building so that one side will not be damaged for the time required by Section 706.4. This is done by extending the fire wall to at least 30" above the lower roof and rating the exterior wall above and in-line to not less than 1-hour up to 15' above the lower roof. The second option is to provide a 1-hour rated roof assembly extending not less than 10 over from the fire wall with no openings permitted within the 10' portion of the roof adjacent to the fire wall.
This proposal does not change the requirements of the section. Rather, the text has been re-written to clarify the expectations for the exterior wall located above the lower roof and sets clear expectations in the exception for horizontal protection by itemizing these requirements.



FIRE WALLS—STEPPED BUILDINGS



FIRE WALLS—EXTENSION EXCEPTION

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This code change is being made in an attempt to clarrify the code. It will not change the cost of construction of fire walls.

FS24-18

Public Hearing Results

Committee Action: **As Submitted**

Committee Reason: The committee found the overall proposal provides better and more understandable text. This is not a technical change. The committee encouraged the proponent to submit a public comment to further refine the language. They noted extra words at the end of item 1; a conflict is style between the 4 items and finally a suggestion that part 4 of the exception may not be a requirement of the exception but rather an allowance of the exception. (Vote 13-1)

Assembly Action: **None**

FS24-18

Individual Consideration Agenda

Public Comment 1:

Proponent: Lee Kranz, representing Washington Association of Building Officials Technical Code Development Committee (lkranz@bellevuewa.gov)requests As Modified by This Public Comment.

Further modify as follows:

2018 International Building Code

706.6.1 Stepped buildings. Where a *fire wall also* serves as an *exterior wall* for a building and separates buildings having different roof levels, such wall shall terminate at a point not less than 30 inches (762 mm) above the lower roof level. Exterior walls above the fire wall extending more than 30 inches (762 mm) above the lower roof shall be of not less than 1-hour fire-resistance-rated construction from both sides with openings protected by fire assemblies having a *fire protection rating* of not less than $^3/_4$ hour. Portions of the exterior walls greater than 15 feet (4572 mm) above the lower roof shall be of non-fire-resistance rated construction unless otherwise rated construction is required by other provisions of this code.

Exception: A *fire wall* serving as part of an exterior wall ~~for a building~~ that separates buildings having different roof levels shall be permitted to terminate at the underside of the roof sheathing, deck or slab of the lower roof, provided items 1, 2, and 3 below are met. The exterior wall above the *fire wall* is not required to be of fire-resistance rated construction, unless required by other provisions of this code ~~all of the following requirements are met:~~

1. The lower roof assembly within 10 feet (3048 mm) of the fire wall has not less than a 1-hour *fire-resistance* rating. and the
2. The entire length and span of supporting elements for the rated roof assembly ~~shall have~~ has a *fire-resistance rating* of not less than 1-hour.
3. Openings in the lower roof ~~shall~~ are not ~~be~~ located within 10 feet (3048 mm) of the *fire wall*.
   ~~4. 1-hour fire- resistance-rated exterior wall protection above the lower roof, as specified in this section, is not required unless fire-resistance-rated construction is required by other provisions of this~~

Commenter's Reason: This public comment addresses recommendations made by members of the Fire Safety Committee at the Group A Committee Action Hearings in Columbus, OH. The Committee approved the proposed changes 13 to 1 but felt there was even more improvements that could be made to this otherwise very confusing code language dealing with regulating fire walls at stepped roof buildings.
In this Public comment we have relocated some of the language in item #4 to the beginning of the exception because, as one of the Committee members said, “Item #4 is not a requirement, as specified in the beginning of the exception; it’s more something you’re allowed to do”. To correct this, we have indicated in the beginning of the exception that if you comply with the requirements, then the portion of the exterior wall above the *fire wall* is not required to be of fire-resistance rated construction unless required by other provisions of the code. This adds clarity for the reader trying to interpret the provision.

The changes in requirements 2 and 3 create grammatical consistency in relation to the charging language at the beginning of the exception. This public comment includes all recommendations made by the Fire Safety Committee members who commented on the proposal.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of

construction
This code change is for clarification only. There is no cost impact for construction.

FS24-18

FS29-18

IBC: 707.8, 707.9

Proposed Change as Submitted

Proponent: Michael O'Brian, Chair, representing FCAC (fcac@iccsafe.org)

2018 International Building Code

Revise as follows

707.8 ~~Joints.~~Joints and voids. ~~Joints made in or between fire barriers, and joints made at the intersection of fire barriers with underside of a fire-resistance-rated floor or roof sheathing, slab or deck above, and the exterior vertical wall intersection shall comply with Section 715~~
The following joints and voids shall be protected in accordance with Section 715.

1. Joints in or between fire barriers.
2. Joints between fire barriers and fire-resistance-rated wall assemblies.
3. Joints between fire barriers and the underside of fire-resistance-rated floors or floor/ceiling assemblies
4. Joints between fire barriers and the underside of fire-resistance rated roofs or roof/ceiling assemblies.
5. Voids at the intersection of fire barriers and nonfire-resistance-rated exterior curtain wall assemblies.
6. Voids between fire barriers and the underside of nonfire-resistance-rated roofs or roof/ceiling assemblies.
7. Voids between fire barriers and the underside of nonfire-resistance-rated floors or floor/ceiling assemblies.

Delete without substitution

~~**707.9 Voids at intersections.** The voids created at the intersection of a *fire barrier* and a nonfire-resistance-rated roof assembly or a nonfire-resistance-rated exterior wall assembly shall be filled. An approved material or system shall be used to fill the void, and shall be securely installed in or on the intersection for its entire length so as not to dislodge, loosen or otherwise impair its ability to accommodate expected building movements and to retard the passage of fire and hot gases.~~

Reason: Other FCAC proposals reorganize and make changes to Section 715, including adding protection requirements for voids, so Section 707.9 is no longer needed. This proposal simplifies the references to Section 715 and includes all of the joints and voids that require protection. Depending on the action on the other proposals Item (7) may need to be deleted from this proposal.
This proposal is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire safety and hazardous materials in new and existing buildings and facilities and the protection of life and property in wildland urban interface areas. In 2017 the Fire-CAC has held 3 open meetings. In addition, there were numerous conference calls, Regional Work Group and Task Group meetings for the current code development cycle, which included members of the committees as well as any interested parties, to discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: https://www.iccsafe.org/codes-tech-support/cs/fire-code-action-committee-fcac/

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The changes are editorial and do not add new construction requirements.

FS29-18

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: Based on the proponent's testimony, without FS30 and FS31-18, this proposal is incomplete. The committee expressed concern whether the list is complete and clear between joints and voids. For example if two rated assemblies adjoin each other and that 'intersection' doesn't need to accommodate movement, how is it classified? (Vote 13-0)

Assembly Action: **None**

FS29-18

Individual Consideration Agenda

Public Comment 1:

Proponent: Gregory Keith, representing The Boeing Company (grkeith@mac.com)requests As Modified by This Public Comment.

Modify as follows:

2018 International Building Code

707.8 Joints and voids.
The following joints and voids shall be protected in accordance with Section 715.

1. Joints in or between fire barriers.
2. Joints between fire barriers and fire-resistance-rated wall assemblies.
3. Joints between fire barriers and the underside of fire-resistance-rated floors or floor/ceiling assemblies
4. Joints between fire barriers and the underside of fire-resistance rated roofs or roof/ceiling assemblies.
5. Voids at the intersection of fire barriers and nonfire-resistance-rated exterior curtain wall assemblies.
6. ~~Voids between fire barriers and the underside of nonfire-resistance-rated roofs or roof/ceiling assemblies.~~
7. ~~Voids between fire barriers and the underside of nonfire-resistance-rated floors or floor/ceiling assemblies.~~

Commenter's Reason: The ICC Fire Code Action Committee (FCAC) developed a number of proposals intended to reorganize and make changes to Section 715. Item FS29-18 created the Section 707.8 charging language and cross-reference for the various Section 715 technical requirements. In the proposal reason statement, the proponent states, This proposal simplifies the references to Section 715 and includes all of the joints and voids that require protection. Depending on the action on the other proposals Item (7) may need to be deleted from the proposal.
As regards the last sentence, this turned out to be a bait and switch proposal. The Fire Safety Committee disapproved both Items FS30-18 and FS31-18. Both proposals dealt with Continuity Head of Wall Joint Systems in buildings with nonfire-resistance-rated construction. The need for such a joint fire protection system in building on non-rated construction has long been questioned. If a chain is only as strong as its weakest link, the Continuity Head of Wall Joint System is the strongest link and serves no logical purpose. There should be no reference to such systems when associated with nonfire-resistance-rated construction. If an owner/architect/developer wishes to exceed the minimum provisions of the code, they may certainly do so. More stringent options should not be specified within given technical requirements.

When Items FS30-18 and FS31-18 were disapproved by the committee, the proponents testified that FS29-18 was incomplete and recommended disapproval. This action was contrary to the statement in their initial reason statement: Depending on the action on the other proposals Item (7) may need to be deleted from the proposal. Based on that proponent statement, FS30-18 and FS31-18 were disapproved and their reference in Section 707.8 should be deleted. Accordingly, the public comment deletes Items 6 and 7 from the list of joints and voids. This is consistent with the actions of the committee and the reason statement of the proponent.

More importantly, it will reverse the attempts to expand the use of fire rated joint systems to buildings of nonrated construction. Although in the cost impact statement for FS31-18 the proponent declared that the requirement would not increase the cost of construction, such systems are very expensive and are out of technical context in buildings of more

economic construction. It should be remembered that buildings of IIB, IIIB and VB construction are limited in height and area and such exotic joint protection methods are of questionable benefit.

Approval of this public comment is consistent with logic, fire protection philosophy, the Fire Safety Committee's actions and the proponent's published reason statement.

Cost Impact: The net effect of the public comment and code change proposal will decrease the cost of construction This public comment eliminates the suggestion that more expensive joint protection systems should be used.

FS29-18

FS31-18

IBC: 202 (New), 202, 707.9, 715.6 (New), Chapter 35

Proposed Change as Submitted

Proponent: Michael O'Brian, Chair, representing FCAC (fcac@iccsafe.org)

2018 International Building Code

SECTION 202 DEFINITIONS

Add new definition as follows

CONTINUITY HEAD-OF-WALL JOINT SYSTEM. An assemblage of specific materials or products that are designed to resist the passage of fire through voids created at the intersection of fire barriers and the underside of nonfire-resistance-rated roofs for a prescribed period of time.

Revise as follows

~~**[BF]**~~ **F RATING.** The time period that the through-penetration firestop system or continuity head-of-wall joint system limits the spread of fire through the penetration ~~when tested in accordance with ASTM E814 or UL 1479.~~or void.

~~**[BF]**~~ **T RATING.** The time period that the penetration firestop system, including the penetrating item, or the continuity head-of-wall joint system limits the maximum temperature rise to 325°F (~~163°C~~180°C) above its initial temperature through the penetration or void on the nonfire ~~side when tested in accordance with ASTM E814 or UL 1479.~~side.

707.9 Voids at intersections. The voids created at the intersection of a *fire barrier* and a nonfire-resistance-rated roof assembly or a nonfire-resistance-rated exterior wall assembly shall be ~~filled. An approved material or system shall be used to fill the void, and shall be securely installed in or on the intersection for its entire length so as not to dislodge, loosen or otherwise impair its ability to accommodate expected building movements and to retard the passage of fire and hot gases.~~protected with a material or system which complies with Section 715.

Add new text as follows

715.6 Voids at intersections of fire barriers and underside of nonfire-resistance-rated roofs. The voids created at the intersection of a fire barrier and the underside of a nonfire-resistance-rated roof sheathing, slab or deck above shall be protectedby an approved continuity head-of-wall joint system installed as tested in accordance with ASTM E2837 to provide an F rating/T rating for a time period not less than the required fire-resistance rating of the wall assembly in which it is installed or be filled with an approved material or system. Such materials or systems shall be securely installed in accordance with the manufacturer's installation instructions in or on the void for its entire length so as not to dislodge, loosen or otherwise impair its ability to accommodate expected building movements and to resist the passage of fire and hot gases. Continuity head-of-wall joint systems shall also be installed in accordance with the listing criteria.

Add new standard(s) follows

ASTM

ASTM International
100 Barr Harbor Drive, P.O. Box C700
West Conshohocken PA 19428-2959
US

E2837-17:

Standard Test Method for Determining the Fire Resistance of Continuity Head-of-Wall Joint Systems Installed Between Rated Wall Assemblies and Nonrated Horizontal Assemblies

Reason: This proposal clarifies language for protecting voids at the intersection of a fire barrier and the underside of a nonfire-resistance-rated roof assembly as follows:

- Section 707.9 was revised to follow the format of Section 707.8, and the protection requirements were moved to Section 715.

- A new Section 715.5 includes the protection requirements previously in Section 707.9 for voids at intersections of fire barriers and the underside of nonfire-resistance-rated roofs. In addition, Section 715.5 includes an option for protecting this void with a continuity head-of-wall joint system.

- A definition of continuity head-of-wall joint system was provided.

- The definitions of F rating and T rating were revised to reference continuity head-of-wall joint systems. In addition, reference to the two firestop test standards was removed from the definitions.

- The definition of T rating was revised to correct an error in the metric conversion of the temperature rise criteria. When converting a **temperature rise**, the equation is °C = 5/9(°F). The 32°F portion of the equation for converting actual temperatures falls out of the equation.

- ASTM E2837 was added as new referenced standard.

- There are currently approximately 20 continuity head-of-wall joint system tested and certified by UL meeting an F rating/T rating.

- This proposal to include ASTM E2837 test aligns with the requirements added in the 2018 edition of NFPA 101.

The proposal compliments a proposal which reorganizes Section 715.

This proposal is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire safety and hazardous materials in new and existing buildings and facilities and the protection of life and property in wildland urban interface areas. In 2017 the Fire-CAC has held 3 open meetings. In addition, there were numerous conference calls, Regional Work Group and Task Group meetings for the current code development cycle, which included members of the committees as well as any interested parties, to discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: https://www.iccsafe.org/codes-tech-support/cs/fire-code-action-committee-fcac/

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal simply provides another option for demonstrating code compliance.

Analysis: A review of the standard proposed for inclusion in the code, ASTM E2837-17, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2018.

FS31-18

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The committee found this proposal to be unnecessary. The existing provisions are adequate. The proponent may wish to restructure as an alternate method. (Vote 11-2)

Assembly Action: **None**

FS31-18

Individual Consideration Agenda

Public Comment 1:

Proponent: Tony Crimi, representing International Firestop Council (tcrimi@sympatico.ca)requests As Modified by This Public Comment.

Further modify as follows:

2018 International Building Code

~~**715.6**~~ **715.5 Voids at intersections of fire barriers and underside of nonfire-resistance-rated roofs.** The voids created at the intersection of a fire barrier and the underside of a nonfire-resistance-rated roof sheathing, slab or deck above shall be protected by one of the following methods:

1. By filling with an approved material or system to retard the interior spread of fire and hot gases.
2. By an approved continuity head-of-wall joint system ~~installed as~~ tested in accordance with ASTM E2837 to provide an F rating/T rating for a time period not less than the required fire-resistance rating of the wall assembly in which it is installed~~or be filled with an approved material or system. Such materials or systems shall be securely installed in accordance with the manufacturer's installation instructions in or on the void for its entire length so as not to dislodge, loosen or otherwise impair its ability to accommodate expected building movements and to resist the passage of fire and hot gases~~. *Continuity head-of-wall joint systems* shall also be installed in accordance with the listing criteria.

Commenter's Reason: The original intent of this proposal was two-fold. First, it moved the requirements on how to protect the void between a fire barrier and the underside of a non fire-resistance-rated roof from Section 707 covering fire barriers to Section 715 covering joints and voids, leaving just a pointer in Section 707, and second, it added the option of protecting this void with a material or system tested to a new ASTM Standard.
During the Committee Action Hearing, the discussion centered on whether a tested system was needed to evaluate the method of protecting this void. Ultimately, the Fire Safety Committee decided the current method of filling the void with an approved material was adequate and disapproved this proposal. This public comment is an attempt to reconsider that decision in light of the following:

The order of reference to the two types of protection has been change to place the traditional requirement to fill the void first, followed by the use of a tested system.
The use of a tested system is an option, not a requirement. Even if this Public Comment is approved, filling the void will still be an option.
The requirement that the materials and systems shall be securely installed in accordance with the manufacturer’s instruction in or on the void for its entire length so as not to dislodge, loosen or otherwise impair its ability to accommodate expected building movements and to resist the passage of fire and hot gases has been deleted from this proposed Section in recognition of FS52-18 which added same language for all joints and voids. FS52-18 was Approved as Submitted 13-0.
When the void is filled with an approved material or system, the code official must evaluate the acceptability of the material and method of filling the void, including whether or not the material or system will dislodge, loosen or otherwise impair the ability of the void to accommodate expected building movements and resist the passage of fire and hot gases. On what basis will the code official make this decision? With a tested system that evaluation has already been made through the cycling and fire testing in accordance with ASTM E2837. With a tested system, it is just a matter of verifying the material or system used was installed in accordance with the requirements of the tested system.

This Public Comment addresses both the original intents of the proposal; those being moving the protection requirements for how to protect this void to Section 715, and introducing the use of materials or system tested to ASTM E2837.

Also note that the section number is being revised as it is desired to have these provisions before the section on spandrels which is currently Section 715.5.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This proposal simply provides another option for demonstrating code compliance.

Public Comment 2:

Proponent: Michael O'Brian, representing FCAC (fcac@iccsafe.org)requests As Modified by This Public Comment.

Replace as follows:

2018 International Building Code

707.9 Voids at intersections. The voids created at the intersection of a *fire barrier* and a nonfire-resistance-rated roof assembly or a nonfire-resistance-rated exterior wall assembly shall be ~~filled. An approved material or system shall be used to fill the void, and shall be securely installed in or on the intersection for its entire length so as not to dislodge, loosen or otherwise impair its ability to accommodate expected building movements and to retard the passage of fire and hot gases~~protected with a material or system which complies with Section 715.

715.5 Voids at intersections of fire barriers and underside of nonfire-resistance-rated roofs. Voids created at the intersection of a fire barrier and the underside of a nonfire-resistance-rated roof sheathing, slab or deck above shall be filled with an approved material or system to retard the interior spread of fire and hot gases.

Commenter's Reason: The original intent of this proposal was two-fold. First, move the requirements on how to protect the void between a fire barrier and the underside of a non fire-resistance-rated roof from Section 707 covering fire barriers to Section 715 covering joints and voids, leaving just a pointer in Section 707, and second, adding the option of protecting this void with a material or system tested to a new ASTM Standard.

During the Committee Action Hearing, the discussion centered on whether a tested system was needed to evaluate the method of protecting this void. Ultimately, the Fire Safety Committee decided the current method of filling the void with an approved material was adequate and disapproved this proposal.

This Public Comment was prepared to only address moving the protection requirements to Section 715. Note it was prepared as a complete replacement of the original proposal. The language used in new Section 715.5 is identical to that Approved under FS52-18 and FS53-18 for protecting other voids using an approved material and system. If successful, the requirements for how to protect all joints and voids will be in one place, that being Section 715.

Also note that the section number being proposed is intended to come before the section on spandrels which is currently Section 715.5.

This public comment is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire safety and hazardous materials in new and existing buildings and facilities and the protection of life and property in wildland urban interface areas. In 2017 the Fire-CAC has held 3 open meetings and in 2018 FCAC held 2 open meetings. In addition, there were numerous conference calls, Regional Work Group and Task Group meetings for the current code development cycle, which included members of the committees as well as any interested parties, to discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at:
https://www.iccsafe.org/codes-tech-support/cs/fire-code-action-committee-fcac/

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This proposal simply provides another option for demonstrating code compliance.

FS31-18

FS34-18

IBC: 708.3, 708.3.1, 708.4.1, 711.2.3, 711.2.4, 711.2.4.1, 711.2.4.1.1, 711.2.4.3, 711.2.4.3.1

Proposed Change as Submitted

Proponent: Stephen Skalko, Stephen V. Skalko, P.E. & Associates, LLC, representing Masonry Alliance for Codes and Standards (svskalko@svskalko-pe.com); William Hall, Portland Cement Association, representing Alliance For Concrete Codes and Standards (jhall@cement.org)

2018 International Building Code

Revise as follows

708.3 Fire-resistance rating. Except as provided in Section 708.3.1 *Fire partitions shall have a fire-resistance rating of not less than 1 hour.*

Add new text as follows

708.3.1 Group I-1, R-1 and R-2 buildings. For Group I-1, R-1 and R-2 occupancies in buildings of Type III, IV and V construction that are more than two stories in height or that have dwelling or sleeping units located on a floor level that is more than 25-feet above the grade plane, the separation walls required by Section 420.2 shall be fire barriers that comply with Section 707 and shall have a 2-hour fire resistance rating. In addition, any load bearing walls shall meet the requirements of Section 1604 without sheathing.

Exceptions:

1. Corridor walls permitted to have a $^1/_2$-hour fire-resistance rating by Table 1020.1.
2. 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~~ 1-hour in buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.

Revise as follows

708.4.1 Supporting construction. The supporting construction for a *fire partition* shall have a *fire-resistance rating* that is equal to or greater than the required fire-resistance rating of the supported *fire partition*.

Exception: In buildings of Types IIB, IIIB and VB construction, the supporting construction requirement shall not apply to 1-hour *fire partitions* separating tenant spaces in covered and open mall buildings, *fire partitions* separating dwelling units, *fire partitions* separating sleeping units and *fire partitions* serving as corridor walls.

711.2.3 Supporting construction. 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 509 provided that the required *fire-resistance rating* does not exceed 1 hour.
2. ~~Horizontal~~ *One-hour fire resistance rated horizontal assemblies* at the separations of *dwelling units* and *sleeping units* as required by Section 420.3.

711.2.4 Fire-resistance rating. The *fire-resistance rating* of *horizontal assemblies* shall comply with Sections 711.2.4.1 through 711.2.4.6 but shall be not less than that required by the building type of construction.

711.2.4.1 Separating mixed occupancies. Except as provided in Section 711.2.4.1.1, Where the *horizontal assembly* separates mixed occupancies, the assembly shall have a *fire-resistance rating* of not less than that required by Section 508.4 based on the occupancies being separated.

Add new text as follows

711.2.4.1.1 Group I-1, R-1 and R-2 buildings. For Group I-1, R-1 and R-2 occupancies in buildings of Type III, IV and V construction that are more than two stories in height or that have dwelling or sleeping units located on a floor level that is

more than 25-feet above grade plane, the horizontal assemblies providing the separations of dwelling and sleeping units as required by Section 420.3 shall have a 2-hour fire resistance rating. In addition, any load bearing walls supporting the horizontal assembly shall comply with the requirements of Section 1604 without the use of sheathing.

711.2.4.3 Dwelling units and sleeping units. Except as provided in Section 711.2.4.3.1, *Horizontal assemblies* serving as dwelling or sleeping unit separations in accordance with Section 420.3 shall be not less than 1-hour *fire-resistance-rated* construction.

711.2.4.3.1 Group I-1, R-1 and R-2 buildings. For Group I-1, R-1 and R-2 occupancies in buildings of Type III, IV and V construction that are more than two stories in height or that have dwelling or sleeping units located on a floor level that is more than 25-feet above grade plane, the horizontal assemblies at the separation of dwelling and sleeping units as required by Section 420.3 shall have a 2-hour fire resistance rating. In addition, any load bearing walls supporting the horizontal assemblies shall meet the requirements of Section 1604 without the use of sheathing.

> **Exception:** Horizontal assemblies separating dwelling units and sleeping units shall be not less than 1 -hour fire-resistance-rated construction in a building of Types IIB, IIIB and VB construction, where the building is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.

Reason: The changing construction methods and the noticeable shift to light weight materials for Group I-1, R-1 and R-2 occupancy buildings; and the continued national trend in reducing fire department staffing numbers, this proposed code language provides for two distinct safety provisions. The first is the increased compartmentalization of the building to reduce fire spread and damage using passive fire protection methods. The second safety provision is the ability of the structure to be constructed in such a way that it retains its structural integrity after being subject to a fire. The provisions of **Section 101.3 Intent**, state:

"The purpose of this code is to establish the minimum requirements to safeguard the public health, safety and general welfare through structural strength, means of egress facilities, stability, sanitation, adequate light and ventilation, energy conservation, and safety to life and property from fire and other hazards attributed to the built environment and to provide safety to fire fighters and emergency responders during emergency operations."

Currently many of these load bearing walls are constructed in such a way that the wall sheathing is a critical part of the structural integrity of the wall. The sheathing is used for localized member stability, global stability, and in many cases the lateral load resisting system for the entire building. During an adverse event, such as a fire this sheathing can be compromised by fire damage, mechanical damage, and water damage compromising the overall structural integrity of the building. Where the current standard test used for fire resistance is the ASTM E119, Standard Test Methods for Fire Tests of Building Construction and Materials, in practice this test does not account for the reduction in strength and stiffness that results from fire and water damage. It is not practical to think that every assembly would be tested at designed load levels and the resulting strength and stiffness data used in design, as a result the proposed provisions would provide for the structure to rely on the sheathing only as a fire resistive element and would allow the structure to maintain its design strength after the sheathing was compromised or removed for any reason.

The proposed story level and floor height is based on the ability for a fire department to make a rescue from the exterior of the structure using the equipment commonly found on an NFPA 1901 equipped motorized fire engine, this using the most common extension ladder size, being a 24 foot long extension ladder which can easily reach a second floor window. In addition, for structures three stories or greater in height, the level of vertical load and potential lateral load on these walls increases and as a result an additional level of safety is needed.

The success of NFPA 13 & 13R sprinkler systems to manage and control fire is acknowledged however, the provisions of this code change are designed the assist those active fire protection systems in effectively doing their job and to provide structural stability and strength that is dictated under the provisions of Section 101.3.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Based on an independent third-party study of rectangular 4-story Type V multi-family dwellings if constructed in three different cities, this code change proposal may or may not increase the cost of construction, depending on location and material costs at the time of the construction.

A multi-family residential structure must be schematically designed to meet all of the requirements of the 2015 International Building Code to accurately evaluate the relative construction cost. Once designed, the cost comparison buildings were reviewed for code compliance, and cost estimates prepared. The study was prepared Walter G. M. Schneider III, Ph.D., P.E., MCP, CBO, CFO and Ryan L. Solnosky, Ph.D., P.E.

The building model chosen for the project was a 4 story multi-family residential structure encompassing approximately 25,000 gross square feet of building area per floor. The cost comparisons are based on the proposed target building assembled using a mixed bedroom scheme for residential occupancies.

The following construction types were included in the evaluation:

- Conventional wood framing with floor system (Type VA construction)
- Light gauge steel framing with concrete slab floor on steel deck (Type IIB construction)
- Load bearing concrete masonry with precast concrete floor (Type IIB construction)
- Load-bearing precast concrete walls and precast concrete floor (Type IIB construction)
- Load-bearing insulated concrete form (ICF) walls* and precast concrete floor (Type IIB construction)
- Load-bearing insulated concrete form (ICF) walls* and ICF concrete floor (Type IIB construction)

* For the ICF systems walls separating dwelling units were specified as concrete masonry.

The cost estimate for each building model included the complete fit out of each building with the exception of movable appliances and furniture.

From the cost estimates for the 3-city study, the report concluded that the compartmentalized construction method utilizing concrete based construction materials was cost competitive with light weight conventional wood frame construction.

Copies of the study are available on request.

FS34-18

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The increases required by this proposal are unwarranted. The cost impact statement is not credible. We always seek a balance when increasing protections and the practical. This proposal does not balance. (Vote 14-0)

Assembly Action: **None**

FS34-18

Individual Consideration Agenda

Public Comment 1:

Proponent: Douglas Schreffler, Logan Fire Company, representing selfrequests As Submitted.

Commenter's Reason: The purpose of this code is to establish the minimum requirements to safeguard the public health, safety and general welfare through structural strength, means of egress facilities, stability, sanitation, adequate light and ventilation, energy conservation, and safety to life and property from fire and other hazards attributed to the built environment and to provide safety to fire fighters and emergency responders during emergency operations. It has been well documented by NIST and UL that the fire loads in modern buildings are higher than historically has been the case, and the heat release rates are higher as well, leading to hotter, more aggressive fires. With the ASTM E-119 test reaching its one hundredth birthday this year and the basis of testing being changed very little over the years, including the all-important time temperature curve, the level of safety for firefighters and first responders has deteriorated since the test has not kept current with current fire trends.

The first part of this proposal seeks to maintain a minimum level of safety for our firefighters and first responders who have to enter buildings during fire conditions, to perform searches and conduct fire suppression activities. This is being accomplished in FS34-18 by the increase in fire rating of assemblies to increase the level of safety to make up for the change in fire intensity, compared to the 100 year old calibrated time-temperature curve in ASTM E-119.

The second part of the FS34-18 proposal addresses the change in how buildings are being constructed under the code. While it has been an option to use load bearing studs to carry high vertical loads in buildings, the way this is being accomplished is changing. Traditionally, the lateral bracing for the studs was provided by bracing elements within the wall like wood or metal blocking based on the type of construction that was being used. In addition, the lateral loads were being resisted by either discrete strapping, wood based panel sheathing, or by a discrete lateral force resisting system. This has also changed with a trend in utilizing the sheathing product as the lateral force resisting system and the element to provide the lateral support to the individual studs. The problem with this approach is that during a fire these materials are compromised or destroyed and the structural integrity is lost. The fire department applies water as part of the extinguishing effort and many of the interior sheathing products partially or completely lose their stiffness and strength as a result. After the initial extinguishment effort, the fire department then actively removes much of the remaining sheathing as part of a process called overhaul. The overhaul process is designed to identify the extent of the fire activity and ensure complete extinguishment. The result is further deterioration of the structural stability of the building and may result in a sudden collapse occurring.

One of the primary issues is that these walls are not easily identified in the field. As a result, firefighters and workers are not aware of what sheathing is acceptable to remove and what sheathing is critical for the stability of the building. The result of which will be the reduction of safety to the point where firefighters and first responders are injured or killed as a result.

The proposal helps address this issue, by requiring that the load carrying capabilities of the structural elements be accomplished without the use of sheathing and would require that positive blocking or strapping be used. These are readily identifiable and seldom removed without conscious thought.

I would like to respond to the committees comment that the increases required by this proposal are unwarranted. The nature of this proposal is seeking to balance the safety of the firefighters and first responders as required by the scope of the code with an identified shortcoming. This proposal allows the code to possibly achieve a similar level of safety that was previously enjoyed and expected prior to the move to leaning down the building to the point where a single issue could produce catastrophic failure. I would contend that this proposal does provide a level of balance that is consistent with the code process.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
See original proposal.

FS34-18

FS36-18

IBC: 708.4

Proposed Change as Submitted

Proponent: Paul Battaglia, STC Sound Control, representing STC Sound Control, President (paul@stcsoundcontrol.com)

2018 International Building Code

Revise as follows

708.4 Continuity. Fire partitions shall extend from the top of the foundation or floor/ceiling assembly below and be securely attached to one of the following:

1. The underside of the floor or roof sheathing, deck or slab above.
2. The underside of a floor/ceiling or roof/ceiling assembly having a fire-resistance rating that is not less than the fire-resistance rating of the fire partition.

Exceptions:

1. Fire partitions shall not be required to extend into a crawl space below where the floor above the crawl space has a minimum 1-hour fire-resistance rating.
2. Fire partitions serving as a corridor wall shall not be required to extend above the lower membrane of a corridor ceiling provided that the corridor ceiling membrane is equivalent to corridor wall membrane, and either of the following conditions is met:

   2.1. The room-side membrane of the corridor wall extends to the underside of the floor or roof sheathing, deck or slab of a fire-resistance-rated floor or roof above.

   2.2. The building is equipped with an automatic sprinkler system installed throughout in accordance with Section 903.3.1.1 or 903.3.1.2, including automatic sprinklers installed in the space between the top of the fire partition and underside of the floor or roof sheathing, deck or slab above.
3. Fire partitions serving as a corridor wall shall be permitted to terminate at the upper membrane of the corridor ceiling assembly where the corridor ceiling is constructed as required for the corridor wall.
4. Fire partitions separating tenant spaces in a covered or open mall building complying with Section 402.4.2.1 shall not be required to extend above the underside of a ceiling. Such ceiling shall not be required to be part of a fire-resistance-rated assembly, and the attic or space above the ceiling at tenant separation walls shall not be required to be subdivided by fire partitions.
5. Fire partitions shall be permitted to extend from the top of a floor underlayment system that is not a component of the floor/ceiling assembly where the building is equipped with an automatic sprinkler system installed throughout in accordance with Section 903.3.1.1 or 903.3.1.2.

Reason: This proposal is intended to allow *continuous* installation of floor underlayment systems, such as those required for impact noise isolation, without compromise to fire safety in buildings. Continuous installation will save 13% of system cost and speed construction. It will also provide isolation of structure-borne sound not possible with discontinuous underlayment installation.
Acoustical underlayment systems are required by IBC 1207.3 to attain high Impact Isolation Classification (IIC) ratings for floors in facilities with dwelling units and sleeping rooms. Continuous installation of underlayment is currently an integral part of many fire-rated floor/ceiling systems that include gypsum cement poured over acoustical mats, recycled newspaper mats, and plywood panels installed over rubber pads (ex: UL Design L563).

Fire partitions may be placed directly on top of these fire-rated floor/ceiling systems under the current IBC 708.4 since they are part of the fire-resistance rated floor/ceiling assemble. *There is no difference in construction details or fire behavior between adjacent rooms when fire partitions are placed on top of the underlayment systems whether the underlayment system is integral to the floor/ceiling system or it isn't.*

We propose that fire partitions should be allowed to be placed directly on these underlayment systems where they are *not* a part of the fire-rated system, especially where automatic sprinkler systems are installed. Furthermore, an underlayment system that performs as a component of a fire-rated floor/ceiling assembly will provide additional fire safety when added to an otherwise complete assembly.

Continuous installation of underlayment provides the additional benefit of structure-borne sound isolation between floors by creating a discontinuous path for sound and vibration between the underlayment and the subfloor.

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

Under current Code requirements a fire-rated partition must be installed on the top of the floor/ceiling assembly prior to placing the additional underlayment. The proposal will allow installation of underlayment systems over an entire building floor system prior to construction of any partitions, thus eliminating additional cutting and fitting around in-place partitions that add 13% to the system cost. It will also eliminate interruptions in the installation process and the related and unnecessary costs of remobilization.

	Fire Partitions in Place	Continuous Installation
Total Floor Area of Underlayment	11,240	11,586
Perimeter Length	1,943	564
Full Panels @ 4x8	352	363
Pads in Field @ 10 per panel	3,520	3,630
Pads at Perimeter @ 2'	972	282
Total Pads	4,492	3,912
Panel Cuts (feet) @ perimeter	1,943	564
Manhours for cuts @ 1.2 minutes/foot	39	11
Perimeter panels installed @ 4'	486	141
Material cost of pads @ $0.9556	$ 4,292.08	$ 3,738.31
Material cost of panels @ $31.16	$ 10,968.32	$ 11,311.08
Manhours: Pads @ 80/hour	56	49
Manhours: Panels @ 15/hour	56	34
Total Manhours	151	94
Total Material Costs	$ 15,260.40	$ 15,049.39
Total Labor Costs @ $32/hour	$ 4,827.32	$ 3,000.96
Total Cost per Square Foot	$ 1.79	$ 1.56
Savings for continuous (%)	13%	
Per square foot savings	$ 0.23	

FS36-18

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The provisions were found to be vague. What is meant by the phrase 'not a component'. The term 'underlayment' is not intended the same as one might use for the underlayment of flooring, and therefore should be defined, or a different word used. Overall there is insufficient information to guide the code user (Vote 12-2)

Assembly Action: **None**

FS36-18

Individual Consideration Agenda

Public Comment 1:

Proponent: Paul Battaglia, representing STC Sound Control, President (paul@stcsoundcontrol.com)requests As Modified by This Public Comment.

Modify as follows:

2018 International Building Code

SECTION 202 DEFINITIONS

Floor/Ceiling Assembly Floor construction with required fire protective materials that provide a fire-resistance rating.

Interior Floor Underlayment

Material or system of materials that is adhered, fastened, or placed on floor construction for patching, leveling, or acoustical purposes, including any supporting materials of 1/2-inch height or less such as sleepers, mats, spacers, or pads.

603.1 Allowable materials. Combustible materials shall be permitted in buildings of Type I or II construction in the following applications and in accordance with Sections 603.1.1 through ~~603.1.3~~603.1.27:

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 fire-resistance-rated construction is not required.
   1.3. Roof construction, including girders, trusses, framing and decking.

      Exception: In buildings of Type IA construction exceeding two *stories above grade plane*, *fire-retardant-treated wood* is not permitted in roof construction where the vertical distance from the upper floor to the roof is less than 20 feet (6096 mm).

   1.4. Balconies, porches, decks and exterior stairways not used as required exits on buildings three *stories* or less above grade plane.
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 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 Section 803.
8. *Trim* installed in accordance with Section 806.
9. Where not installed greater than 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.
10. Finish flooring installed in accordance with Section 805.
11. Partitions dividing portions of stores, offices or similar places occupied by one tenant only and that do not establish a *corridor* serving an *occupant load* of 30 or more shall be permitted to be constructed of *fire-retardant-treated* wood, 1-hour fire-resistance-rated construction or of wood panels or similar light construction up to 6 feet (1829 mm) in height.
12. Stages and platforms constructed in accordance with Sections 410.2 and 410.3, respectively.
13. Combustible *exterior wall coverings*, balconies and similar projections and bay or oriel windows in accordance with Chapter 14 and Section 705.2.3.1.
14. Blocking such as for handrails, millwork, cabinets and window and door frames.
15. Light-transmitting plastics as permitted by Chapter 26.
16. Mastics and caulking materials applied to provide flexible seals between components of *exterior wall* construction.
17. Exterior plastic veneer installed in accordance with Section 2605.2.
18. Nailing or furring strips as permitted by Section 803.15.
19. Heavy timber as permitted by Note c to Table 601 and Sections 602.4.3 and 705.2.3.1.
20. Aggregates, component materials and admixtures as permitted by Section 703.2.2.
21. Sprayed fire-resistant materials and intumescent and mastic fire-resistant coatings, determined on the basis of *fire resistance* tests in accordance with Section 703.2 and installed in accordance with Sections 1705.14 and 1705.15, respectively.
22. Materials used to protect penetrations in fire-resistance-rated assemblies in accordance with Section 714.
23. Materials used to protect joints in fire-resistance-rated assemblies in accordance with Section 715.
24. Materials allowed in the concealed spaces of buildings of Types I and II construction in accordance with Section 718.5.
25. Materials exposed within plenums complying with Section 602 of the International Mechanical Code.
26. Wall construction of freezers and coolers of less than 1,000 square feet (92.9 m^2), in size, lined on both sides with noncombustible materials and the building is protected throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1.
27. <u>Interior floor underlayment.</u>

708.4 Continuity. Fire partitions shall extend from the top of the foundation or floor/ceiling assembly below and be securely attached to one of the following:

1. The underside of the floor or roof sheathing, deck or slab above.
2. The underside of a floor/ceiling or roof/ceiling assembly having a fire-resistance rating that is not less than the fire-resistance rating of the fire partition.

Exceptions:

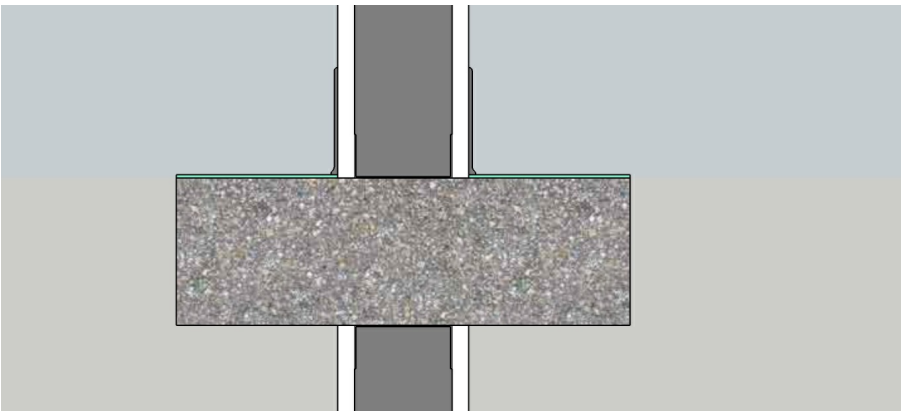
1. Fire partitions shall not be required to extend into a crawl space below where the floor above the crawl space has a minimum 1-hour fire-resistance rating.
2. Fire partitions serving as a corridor wall shall not be required to extend above the lower membrane of a corridor ceiling provided that the corridor ceiling membrane is equivalent to corridor wall membrane, and either of the following conditions is met:

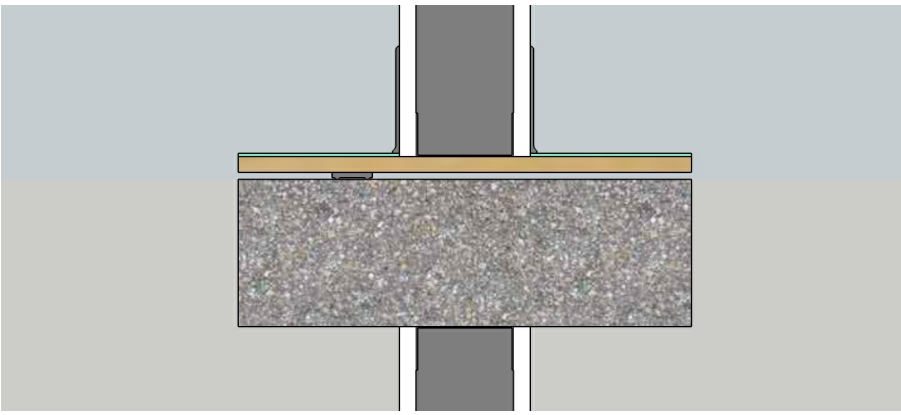
    2.1. The room-side membrane of the corridor wall extends to the underside of the floor or roof sheathing, deck or slab of a fire-resistance-rated floor or roof above.
    2.2. The building is equipped with an automatic sprinkler system installed throughout in accordance with Section 903.3.1.1 or 903.3.1.2, including automatic sprinklers installed in the space between the top of the fire partition and underside of the floor or roof sheathing, deck or slab above
3. Fire partitions serving as a corridor wall shall be permitted to terminate at the upper membrane of the corridor ceiling assembly where the corridor ceiling is constructed as required for the corridor wall.
4. Fire partitions separating tenant spaces in a covered or open mall building complying with Section 402.4.2.1 shall not be required to extend above the underside of a ceiling. Such ceiling shall not be required to be part of a fire-resistance-rated assembly, and the attic or space above the ceiling at tenant separation walls shall not be required to be subdivided by fire partitions.
5. Fire partitions shall be permitted to extend from the top of ~~a~~ an interior floor underlayment system ~~that is not a component of the floor/ceiling assembly~~ where the building is equipped with an automatic sprinkler system installed throughout in accordance with Section 903.3.1.1 or 903.3.1.2.

Commenter's Reason: This Public Comment supplements the Proposal and answers concerns raised at the Committee Hearings in April 2018. A definition of “interior floor underlayment” has been included. Also, a definition of “floor/ceiling assembly” is proposed since it has not yet been included in the Codes. “Interior floor underlayment” is included in the list of materials permitted in Construction Types I & II. The original proposal regarding continuity of fire partitions remains as an Exception, and includes fire protection.
Floor underlayment is not well-represented in the Codes. These commonly include luan plywood, recycled newspaper panels (Homasote), gypsum cement (Gypcrete) over polymeric filament mats (Acousti-mat), cork, recycled rubber mats (Regupol), and rubber pads supporting wood panels (Acoustic Sleeper). The majority of these systems are combustible, and they are not tested for critical radiant flux as are interior floor finishes (IBC 804).

Most of the interior floor underlayments that are commonly used in *non-combustible* construction have been tested and listed by Underwriters Laboratories as components of floor/ceiling assemblies in *combustible* construction. The details of fire partitions mounted on underlayment systems is a common occurrence with these UL Designs, and should be extended to non-combustible construction.

The Purpose of this proposal remains the same – eliminate an acoustical structure-borne sound flanking path that occurs as a result of the current Code language while retaining fire safety. The most effective example is a wall-mounted television set on a fire partition that is required to extend from the top of a concrete deck to the bottom of the deck above, with repetitious floor plans -- neighbors hear each others TV's quite efficiently. If the same partition were to be mounted on top of an acoustical underlayment system rather than directly on the deck, the sound path would be interrupted and privacy obtained.





Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
Cost savings can be expected, approximately 13% of the underlayment system cost due to continuous installation as indicated in the proposal.

FS36-18

FS39-18

IBC: 710.5, 710.5.3

Proposed Change as Submitted

Proponent: John Williams, Chair, representing Healthcare Committee (AHC@iccsafe.org)

2018 International Building Code

Revise as follows

710.5 Openings. Openings in smoke partitions shall comply with Sections 710.5.1 ~~and 710.5.2.~~ through 710.5.3

Add new text as follows

710.5.3 Pass through openings in Group I-2 Condition 2. Where pass through openings are provided in smoke partitions in Group I-2, Condition 2 occupancies, such openings shall comply with the following:

1. Smoke compartment in which the pass through openings occur do not contain a patient care suite or sleeping room.
2. Pass through openings are installed in a door or vision panel that is not required to have a fire protection rating.
3. The top of the pass through opening is located a maximum of 48 inches above the floor.
4. The aggregate area of all such pass through openings within a single room shall not exceed 80 square inches ($0.05m^2$).

Reason: At Section 710.5.3, the addition of pass through openings is to recognize important operational functions in the context of the corridor wall. There are several examples of this operational practice. Hospital pneumatic tube delivery systems cannot handle some materials and others where the shaking of the material compromises its effectiveness. In particular, chemotherapy, gross lab materials (tissue biopsy, small organ, etc.) and cash / checks are restricted from being delivered via pneumatic tube system, which is why walk-up pickup and delivery is still an important operational feature of some areas.
First, in a hospital pharmacy, air pressure relationships are established to keep a safe environment. From an operational standpoint, there are frequent pickups by patient care staff from an in-house pharmacy that require direct hand-off and signing of forms. In addition, there are basic security requirements from DEA and state pharmacy boards that require the pharmacy material to be secured, whether it is narcotics, opioids or chemotherapy materials. Opening and closing the door compromises the air relationships prescribed by the IMC Section 407.1, as well as security.

In a laboratory setting, air pressure relationships are critical, and many samples get delivered by hand through a pass-through. Cashier areas are set like a secured bank windows, due to the co-payment cash being delivered by staff, or a patient with a financial issue to be discussed.

This concept has existed in hospitals for a long time, because it has been allowed by the federal standard (K364). This code changes seeks to establish the same criteria to respond to the operational need of the corridor, while maintaining its integrity.

This proposal is submitted by the ICC Committee on Healthcare (CHC). The CHC was established by the ICC Board to evaluate and assess contemporary code issues relating to healthcare facilities. This is a joint effort between ICC and the American Society for Healthcare Engineering (ASHE), a subsidiary of the American Hospital Association, to eliminate duplication and conflicts in healthcare regulation. In 2017 the CHC held 2 open meetings and numerous conference calls, *which included members of the committees as well as any interested parties, to discuss and debate the proposed changes*. Information on the CHC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CHC effort can be downloaded from the CHC website at: https://www.iccsafe.org/codes-tech-support/cs/icc-committee-on-healthcare/.

Cost Impact: The code change proposal will increase the cost of construction
Costs will increase with this change because it allows extra features to be added to an opening. However, it does not add cost to the healthcare industry because we already follow these requirements in the context of the federal standard.

FS39-18

Public Hearing Results

Committee Action: **As Submitted**

Committee Reason: We do need to coordinate with the federal standards, yet there was a concern that the openings are too large and perhaps shutter to reduce actual leakage. The committee suggested a modification to clarify that all 4 items must be complied with. (Vote 13-1)

Assembly Action: **None**

FS39-18

Individual Consideration Agenda

Public Comment 1:

Proponent: John Williams, representing Healthcare Committee (ahc@iccsafe.org)requests As Modified by This Public Comment.

Modify as follows:

2018 International Building Code

710.5.3 Pass through openings in Group I-2 Condition 2. Where pass through openings are provided in smoke partitions in Group I-2, Condition 2 occupancies, such openings shall comply with all of the following:

1. The smoke ~~Smoke~~ compartment in which the pass through openings occur do not contain a patient care suite or sleeping room.
2. Pass through openings are installed in a wall, door or vision panel that is not required to have a fire ~~protection~~ resistance rating.
3. The top of the pass through opening is located a maximum of 48 inches above the floor.
4. The aggregate area of all such pass through openings within a single room shall not exceed 80 square inches ($0.05m^2$).

Commenter's Reason: The modification is in response to the improvements suggested by the committee and will provide greater clarification of the requirements.

Cost Impact: The net effect of the public comment and code change proposal will increase the cost of construction Costs will increase with this change because it allows extra features to be added to an opening. However, it does not add cost to the healthcare industry because we already follow these requirements in the context of the federal standard.

FS39-18

FS46-18

**IBC: 202, 202, 714.2.1 **

Proposed Change as Submitted

Proponent: William Koffel, representing Firestop Contractors International Association (wkoffel@koffel.com)

2018 International Building Code

SECTION 202 DEFINITIONS

Add new definition as follows

FIRESTOP IDENTIFICATION DEVICE A label or placard, of any type, that identifies the firestop system.

Add new text as follows

714.2.1 Firestop identification devices. Penetration firestop systems shall be permanently identified with a device, label or other method. The device shall be handwritten with permanent ink, or pre-printed, legible tag or label, or format readable by an electronic device. The device shall be located on both sides of the fire barrier, smoke barrier or fire wall. The device shall at a minimum have the following information:

1. Listing system number or engineering judgement number.
2. Date of Installation
3. Installing company name, contact information.
4. Manufacturer name of the firestop system.
5. "Warning, Penetration Firestop System - Do Not Remove or Tamper.

Adhesive or mechanically attached Identification devices shall be located within 6 inches (150 mm), of the penetration firestop system edge, on top of the horizontal assembly, 6 inches (150 mm) below or beside the firestop system. For multiple penetrations of the same listing number arranged within 6 inches (150 mm) of each other, the device shall be located centered under or within 6 inches (150 mm) to either side of the grouping. Hanging tags shall be attached to the penetrating item with permanent wire, string or plastic tie, within 6 inches (150 mm) of the assembly.

Reason: Installing penetration firestop systems looks as easy as applying red caulk to an assembly. Firestop systems are not easy to install. Firestop systems are very complex, detailed listed systems that take understanding of the tolerances so they work when called upon by fire.
This proposal adds a requirement to identify the firestop system used to maintain fire-resistance at the assembly. This is a way for the special inspection agency inspector, during construction, and building owner and manager, during the life of the building, to understand quickly what listing has been used. The listing has the information needed to evaluate the installation and maintain compliance during construction and through the building life cycle. It's not read caulk that's been installed. It's an assemblage of materials designed to keep fire from spreading outside the room of origin. The identification device makes the verification process much more efficient and effective.

Cost Impact: The code change proposal will increase the cost of construction
The cost of an identification device will add a very small amount to the cost of construction, but will decrease the cost of inspection and maintenance. The identification devlce cost per penetration firestop system is approximately $0.10US per penetration.

FS46-18

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The committee, in part, saw the value of such systems, but not everyone. In addition the committee expressed a number of concerns. This doesn't help improper installations, field changes not reflected on plans and then changed again in the field. Nothing prohibits improper labelling. The contractors should provide this as part of showing their compliance with the code. The label on the wall of 1 or 2 hours, etc, should be enough to indicate the type of penetration protection. (Vote 8-6)

Assembly Action: **None**

FS46-18

Individual Consideration Agenda

Public Comment 1:

Proponent: William Koffel, representing Firestop Contractors International Association (wkoffel@koffel.com)requests As Submitted.

Commenter's Reason: Clearly the Fire Safety Committee was split on the benefit of this change as evidenced by an 8-6 vote.
While the use of a firestop identification device does not, in and of itself, prevent incorrect installations, it certainly enhances the likelihood of proper oversight and enforcement. Providing the required marking on the wall simply identifies the assembly as have a certain characteristic, such as being a fire barrier. It does not provide any information regarding the protection of the penetrations of the assembly. With over 9,000 listed firestop systems in the UL s directory and thousands more in the FM Approval Guide and Intertek s directory, it s not easy to identify the system that was installed. The identification device provides an efficient method for the code official, owner s representative, and/or special inspection agency to identify what system was supposedly installed and whether the system is appropriate for the specific application. It also allows such individuals to then verify that the system was installed in accordance with the listing criteria and the manufacturer s installation instructions. Lastly, it provides the building owner with the system information so that the systems can be properly identified in the inventory required by the IFC and so that the proper maintenance and repair procedures, as identified in the manufacturer s installation instructions, can be identified and followed.

The Committee Reason states the contractors should provide such information as part of their way of demonstrating compliance with the code requirements. The FCIA membership agrees and the practice is common amongst many contractors. However, unless firestop identification systems are required by the Code, they will not be provided by all contractors.

The following photograph shows one application that would comply with the proposed language It should be noted that there are other systems that utilize other technologies, such as bar coding, that would also provide the information and would be far less obvious to the occupants within the area.

Cost Impact: The net effect of the public comment and code change proposal will increase the cost of construction Some contractors provide the identification devices already and do it with competitive pricing such that one could say there is no increase in cost. The actual cost of the identification device is approximately $0.10 US per penetration. Even if there is a small increase in the cost of construction, providing the information will most likely decrease the cost of inspection and maintenance.

FS46-18

FS48-18

IBC: 714.4.2

Proposed Change as Submitted

Proponent: Homer Maiel, representing ICC Tri-Chapter (Peninsula, East Bay, Monterey Bay) (hmaiel@gmail.com)

2018 International Building Code

Revise as follows

714.4.2 Membrane penetrations. *Membrane penetrations* shall comply with Section 714.4.1. 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 2-hour fire-resistance-rated walls and partitions by steel electrical boxes that do not exceed 16 square inches (0.0 103 m^2) in area, provided that the aggregate area of the openings through the membrane does not exceed 100 square inches (0.0645 m^2) in any 100 square feet (9.29 m^2) of wall area. The *annular space* between the wall membrane and the box shall not exceed $^1/_8$ inch (3.2 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 noncommunicating 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 718.2.1.
    1.4. By protecting both outlet boxes with *listed* putty pads.
    1.5. By other *listed* materials and methods.
2. *Membrane penetrations* by *listed* electrical boxes of any material, provided that 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 (3.2 mm) unless *listed* otherwise. Such boxes on opposite sides of the wall or partition shall be separated by one of the following:

    2.1. By the horizontal distance specified in the listing of the electrical boxes.
    2.2. By solid *fireblocking* in accordance with Section 718.2.1.
    2.3. By protecting both boxes with *listed* putty pads.
    2.4. By other *listed* materials and methods.
3. *Membrane penetrations* by electrical boxes of any size or type, that 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 that 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 E814 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 that it is covered by a metal escutcheon plate.
6. *Membrane penetrations* of maximum 2-hour fire-resistance-rated walls and partitions by steel electrical boxes that exceed 16 square inches (0.0 103 m^2) in area, or steel electrical boxes of any size having an aggregate area through the membrane exceeding 100 square inches (0.0645 m^2) in any 100 square feet (9.29 m^2) of wall area, provided that such penetrating items are protected by *listed* putty pads or other *listed* materials and methods, and installed in accordance with the listing.
7. <u>The wall membrane of 1- or 2-hour fire-resistance-rated wall *assemblies* is permitted to be interrupted with a double wood end stud at the intersection of light frame wood wall assemblies provided: the intersecting wall has a membrane of 5/8 inch Type X gypsum, all penetrating items through the double wood stud are protected in accordance with Section 714.4.1.1 or 714.4.1.2, and the interrupted membrane is tight to the double wood stud. The cavity of the 1- or 2- hour fire-resistance-rated wall assembly shall be blocked solid with material suitable as a fire block in Section 718.2 if the wall membrane is interrupted on both sides of the wall within a single stud space.</u>

Reason: This proposal provides an exception for wall assemblies similar to exception 7 currently in Section 714.5.2 for membrane penetrations of a horizontal assembly. Additional material suitable as a fire block is added to the wall cavity if a similar condition occurs on both sides of the 1- or 2- hour rated wall into the same stud cavity. Double studs at the intersection have an intrinsic fire resistance rating greater than the layer of 5/8" gypsum board and is suitable in this wall application similar to the horizontal assembly found in section 714.5.2.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal is merely guiding the user as to how to treat the intersection of two fire rated walls. In the absence of any current guidelines, this could potentially increase the cost of construction

FS48-18

Public Hearing Results

Committee Action: **As Submitted**

Committee Reason: Approved based on proponent's reason statement. The new text parallels horizontal assembly protections. (Vote 11-2)

Assembly Action: **None**

FS48-18

Individual Consideration Agenda

Public Comment 1:

Proponent: Stephen Thomas, Colorado Code Consulting, LLC, representing Himself (sthomas@coloradocode.net)requests Disapprove.

Commenter's Reason: This proposal is trying to say that a wall intersection is a penetration. This is a bad precedent to set. They are trying to compare this to the case where a wall intersects a floor- or roof-ceiling assembly. That change was based on language in the UL Directory regarding non-rated walls intersecting rated horizontal assemblies. There is no similar language in the UL Directory regarding walls intersecting other walls. The proponent has not provided any documentation to show that this has been problem. Many UL Designs include the wall intersection in their tested assembly listing. No information was provided regarding the rating of the two walls. Is there a difference between a non-rated wall intersecting a rated wall and a rated wall intersecting a rated wall? There was also no information provided to show that there is a problem with wood, but not for steel stud walls. Is there a difference between the two types of materials? This language is not needed in the code. The only justification is that we do it for horizontal assemblies, so we should do the same for walls. There needs to be more technical justification to show the need for this change.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
If the item is disapproved, there will be no change to the cost of construction.

FS48-18

FS49-18

IBC: 714.4.3, 714.5.3

Proposed Change as Submitted

Proponent: Lee Kranz, City of Bellevue, WA, representing Washington Association of Building Officials Technical Code Development Committee (lkranz@bellevuewa.gov)

2018 International Building Code

Revise as follows

714.4.3 Dissimilar materials. Noncombustible penetrating items shall not connect to combustible items beyond the point of firestopping unless it can be demonstrated that the *fire-resistance* integrity of the wall is maintained.

Exceptions:

1. Where dissimilar materials are used and the portion of the penetrating material extending into or through the fire-resistance rated assembly is combustible, the combustible material shall extend not less than 6 inches past both sides of the approved penetration firestop system before transitioning to non-combustible materials. The 6 inches shall be measured as the developed length and shall be continuous through all fittings and transitions.

2. Where dissimilar materials are used and the portion of the penetrating material extending into or through the fire-resistance rated assembly is non-combustible, the non-combustible material shall extend not less than 36 inches past both sides of the approved penetration firestop system before transitioning to combustible materials. The 36 inches shall be measured as the developed length and shall be continuous through all fittings and transitions.

714.5.3 Dissimilar materials. Noncombustible penetrating items shall not connect to combustible materials beyond the point of firestopping unless it can be demonstrated that the *fire-resistance* integrity of the *horizontal assembly* is maintained.

Exceptions:

1. Where dissimilar materials are used and the portion of the penetrating material extending into or through the fire-resistance rated assembly is combustible, the combustible material shall extend not less than 6 inches past both sides of the approved penetration firestop system before transitioning to non-combustible materials. The 6 inches shall be measured as the developed length and shall be continuous through all fittings and transitions.
2. Where dissimilar materials are used and the portion of the penetrating material extending into or through the fire-resistance rated assembly is non-combustible, the non-combustible material shall extend not less than 36 inches past both sides of the approved penetration firestop system before transitioning to combustible materials. The 36 inches shall be measured as the developed length and shall be continuous through all fittings and transitions.

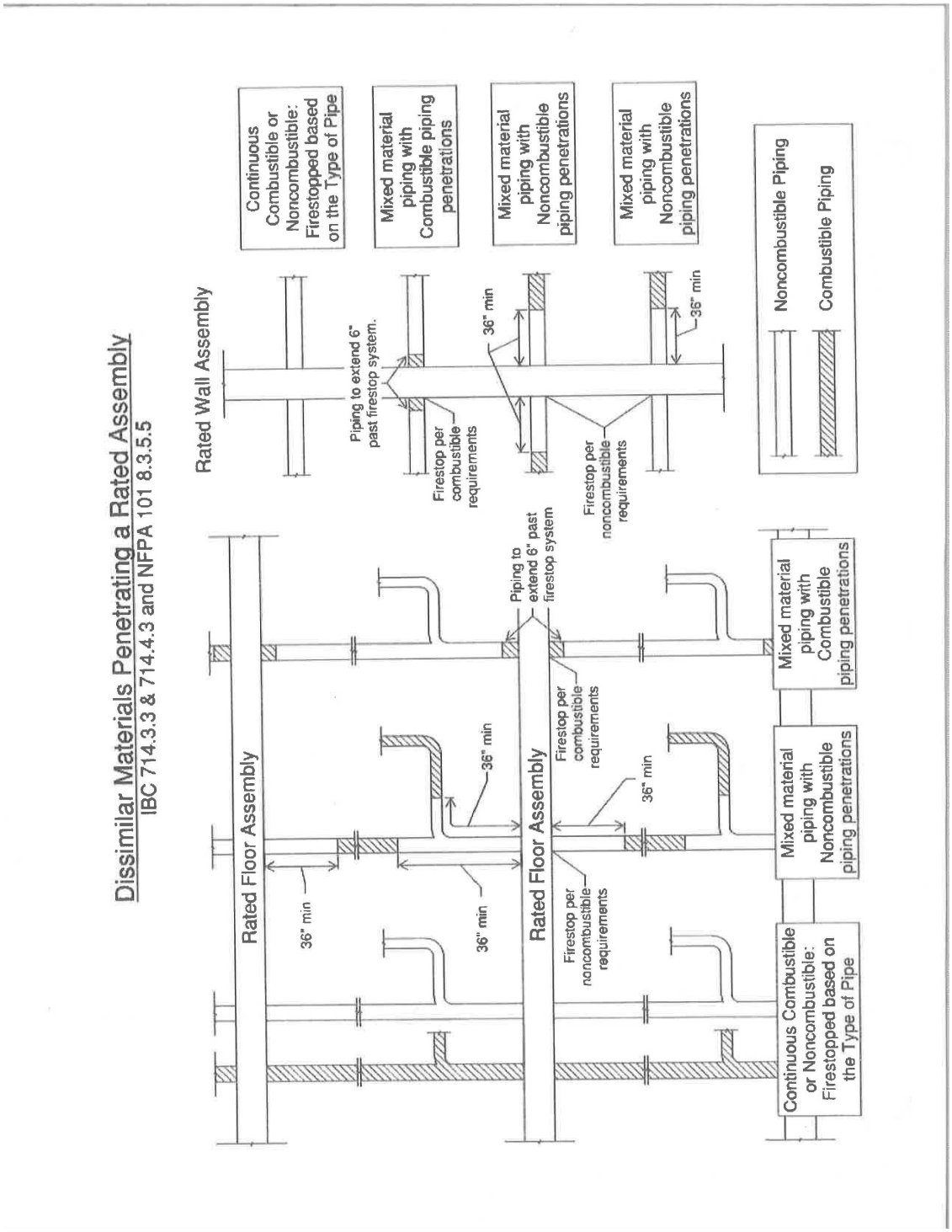
Reason: Many plumbing system installations involve the combined use of combustible and noncombustible piping, drains, waste and vents. For example, cast iron (noncombustible) drains may be used for sound control but plastic (combustible) vents are combined on each story for cost savings. The reason for these designs is understandable but the integrity of fire-resistive rated construction may be compromised as a result of mixing these materials. The 6" and 36" dimensions are drawn from Section 8.3.5.5 of the 2015 edition of NFPA 101, which provides a method that maintains the integrity of the fire-resistive rated assembly as reflected in this proposal. This code change will also reduce delays and the cost of construction by eliminating the need for testing.

NFPA 101 2015 Edition

8.3.5.5 Transitions.

8.3.5.5.1
Where piping penetrates a fire resistance–rated wall or floor assembly, combustible piping shall not connect to noncombustible piping within 36 in. (915 mm) of the firestop system or device without demonstration that the transition will not reduce the fire resistance rating, except in the case of previously approved installations.

8.3.5.5.2
Unshielded couplings shall not be used to connect noncombustible piping to combustible piping unless it can be demonstrated that the transition complies with the fire-resistive requirements of 8.3.5.1.



Bibliography: 2015 Edition of NFPA 101, Section 8.3.5.5.1 and 8.3.5.5.2.

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

This code change will reduce the cost of construction by eliminating the need for testing.

FS49-18

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The proposal is not providing the clarity it seeks. There is concern about the insufficient testing. What is the science behind the 36 inch distance. Perhaps a more specific exception to the pipes which were the focus of the debate. (Vote 14-0)

Assembly Action: **None**

FS49-18

Individual Consideration Agenda

Public Comment 1:

Proponent: Lee Kranz, representing Washington Association of Building Officials Technical Code Development Committee (lkranz@bellevuewa.gov)requests As Modified by This Public Comment.

Modify as follows:

2018 International Building Code

714.4.3 Dissimilar materials. Noncombustible penetrating items shall not connect to combustible items beyond the point of firestopping unless it can be demonstrated that the *fire-resistance* integrity of the wall is maintained~~.~~
Exception:

~~1. Where dissimilar materials are used and the portion of the penetrating material extending into or through the fire-resistance rated assembly is combustible, the combustible material shall extend not less than 6 inches past both sides of the approved penetration firestop system before transitioning to non-combustible materials. The 6 inches shall be measured as the developed length and must be continuous through all fittings and transitions.~~

~~2. Where dissimilar materials are used and the portion of the penetrating material extending into or through the fire-resistance rated assembly is non-combustible, the~~ Non-combustible materials shall be permitted to connect to combustible materials ~~shall extend~~ not less than 36 inches past both sides of an ~~the~~ approved through-penetration firestop system ~~before transitioning to combustible materials~~ that has a T rating or is exempted from a T rating, in accordance with Section 714.4.1.2. The 36 inches shall be measured as the developed length and must be continuous through all fittings and transitions.

714.5.3 Dissimilar materials. Noncombustible penetrating items shall not connect to combustible materials beyond the point of firestopping unless it can be demonstrated that the *fire-resistance* integrity of the *horizontal assembly* is maintained.

Exception:

1. ~~Where dissimilar materials are used and the portion of the penetrating material extending into or through the fire-resistance rated assembly is combustible, the combustible material shall extend not less than 6 inches past both sides of the approved penetration firestop system before transitioning to non-combustible materials. The 6 inches shall be measured as the developed length and shall be continuous through all fittings and transitions.~~
2. ~~Where dissimilar materials are used and the portion of the penetrating material extending into or through the fire-resistance rated assembly is non-combustible, the~~ Non-combustible material shall be permitted to connect to combustible materials ~~extend~~ not less than 36 inches past both sides of ~~the~~ an approved penetration firestop system ~~before transitioning to combustible materials~~ that has a T-rating or is exempted from a T-rating, in accordance with Section 714.5.1.2. The 36 inches shall be measured as the developed length and shall be continuous through all fittings and transitions.

Commenter's Reason: At the Committee Action Hearings in Columbus, it was pointed out that our original code change was flawed because it included an exception for combustible materials penetrating a fire-resistance rated floor or wall assembly but the charging language in both IBC Sections 714.4.3 and 714.5.3 applies only to noncombustible materials transitioning to combustible.

This Public Comment modifies the original code change to be consistent with NFPA 101, Section 8.3.5.5 which requires noncombustible materials to extend at least 36" past the membrane of a fire-resistance rated floor or wall assembly before transitioning to combustible materials. We presume this is to allow for conductive heat found in noncombustible materials to dissipate before the transition to combustible materials are made thereby reducing the potential for fire spread.

In this Public Comment, all references to combustible materials have been deleted. When combustible materials penetrate a fire-resistance rated floor or wall assembly conductive heat is not an issue and the code does not regulate the distance before a transition from combustible to noncombustible materials is made. The breach made in the fire-resistance rated wall or floor for combustible penetrating items will be protected by listed fire-stop assemblies which will "choke-off" the opening through the use of intumescent materials. The combustible materials will readily burn-away in a fire but the fire should not spread if an approved fire stop assembly is installed.

Cost Impact: The net effect of the public comment and code change proposal will decrease the cost of construction If approved this code change will reduce the cost of construction by allowing for combustible and non-combustible transitions to occur without the need for tests to be required.

FS49-18

FS53-18

IBC: 202 (New), 202, 715.4, 715.4.1 (New), 715.5, 715.6, 715.7, 715.8, 1705.17

Proposed Change as Submitted

Proponent: Michael O'Brian, Chair, representing FCAC (fcac@iccsafe.org)

2018 International Building Code

SECTION 202 DEFINITIONS

Add new definition as follows

PERIMETER FIRE CONTAINMENT SYSTEM. An assemblage of specific materials or products that are designed to resist for a prescribed period of time the passage of fire through voids created at the intersection of exterior curtain wall assemblies and fire-resistance-rated floor or floor/ceiling assemblies.

Revise as follows

~~**[BF]**~~ **F RATING.** The time period that the through-penetration firestop system or perimeter fire containment system limits the spread of fire through the penetration ~~when tested in accordance with ASTM E814 or UL 1479.~~or void.

715.4 Exterior curtain wall/fire-resistance-rated floor ~~intersection.~~intersections. ~~Where fire-resistance-rated floor or floor/ceiling assemblies are required, voids~~ Voids created at the intersection of ~~the~~ exterior curtain wall assemblies and ~~such floor~~ fire-resistance-rated floor or floor/ceiling assemblies shall be ~~sealed~~ protected with an *approved*perimeter fire containment system to prevent the interior spread of fire. Such systems shall ~~be securely installed and tested in accordance with ASTM E2307 to~~ provide an *F rating* for a time period not less than the *fire-resistance rating* of the floor or floor/ceiling assembly. Height and *fire-resistance* requirements for curtain wall spandrels shall comply with Section ~~705.8.5.**Exception:** Voids created at the intersection of the exterior curtain wall assemblies and such floor assemblies where the vision glass extends to the finished floor level shall be permitted to be sealed with an approved material to prevent the interior spread of fire. Such material shall be securely installed and capable of preventing the passage of flame and hot gases sufficient to ignite cotton waste where subjected to ASTM E119 time-temperature fire conditions under a minimum positive pressure differential of 0.01 inch (0.254 mm) of water column (2.5 Pa) for the time period not less than the *fire-resistance rating* of the floor assembly.~~
705.8.5.

Add new text as follows

715.4.1 Fire test criteria. Perimeter fire barriers shall be tested in accordance with the requirements of ASTM E2307.

> **Exception:** Voids created at the intersection of the exterior curtain wall assemblies and floor assemblies where the vision glass extends to the finished floor level shall be permitted to be protected with an approved material to prevent the interior spread of fire. Such material shall be securely installed and capable of preventing the passage of flame and hot gases sufficient to ignite cotton waste where subjected to ASTM E119 time-temperature fire conditions under a minimum positive pressure differential of 0.01 inch (0.254 mm) of water column (2.5 Pa) for the time period not less than the *fire-resistance rating* of the floor assembly.

Revise as follows

~~**715.4.1**~~ **715.5 Exterior curtain wall/nonfire-resistance-rated floor assembly intersections.** Voids created at the intersection of exterior curtain wall assemblies and nonfire-resistance-rated floor or floor/ceiling assemblies shall be ~~sealed~~ filled with an *approved* material or system to retard the interior spread of fire and hot gases between *stories*.

~~**715.4.2**~~ **715.6 Exterior curtain wall/vertical fire barrier intersections.** Voids created at the intersection of nonfire-resistance-rated exterior curtain wall assemblies and vertical *fire barriers* shall be filled. An approved material or system shall be used to fill the void and shall be securely installed in or on the intersection for its entire length so as not to dislodge, loosen or otherwise impair its ability to accommodate expected building movements and to retard the passage of fire and hot gases.

~~**715.5**~~ **715.7 Spandrel wall.** Height and *fire-resistance* requirements for curtain wall spandrels shall comply with Section 705.8.5. Where Section 705.8.5 does not require a fire-resistance-rated spandrel wall, the requirements of Section 715.4 shall still apply to the intersection between the spandrel wall and the floor.

~~**715.6**~~ **715.8** ~~**Fire-resistant joint systems**~~ **Joints and voids in smoke barriers.** *Fire-resistant joint systems protecting joints* in *smoke barriers*, and ~~joints~~ perimeter fire containment systems protecting voids 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 L rating of the joint system shall not exceed 5 cfm per linear foot (0.00775 m^3/s m) of joint at 0.30 inch (~~7.47~~ 74.7 Pa) of water for both the ambient temperature and elevated temperature tests.

[BF] 1705.17 Fire-resistant penetrations and joints. In high-rise buildings or in buildings assigned to *Risk Category* III or IV, *special inspections* for *through-penetrations*, membrane penetration firestops, *fire-resistant joint systems* and perimeter fire ~~barrier~~ containment systems that are tested and *listed* in accordance with Sections 714.4.1.2, 714.5.1.2, 715.3 and 715.4 shall be in accordance with Section 1705.17.1 or 1705.17.2.

Reason: The primary intent of this proposal is to introduce the phrase “Perimeter Fire Containment Systemr” to describe the method of protecting the void at the intersection of an exterior curtain wall assembly and a fire-resistance-rated floor or floor/ceiling assembly. Having such a phrase simplifies the code language by having a short and concise phrase to describe such intersections. This proposal also creates consistency with other provisions of Section 715 which states voids which are not required to be tested to any particular fire test standards are to be “filled”, and joints and voids which are required to be tested to a specific standard are to be “protected”. The revisions to Section 715.8 are intended to update the section heading to include both types of joints and voids referenced in the body of the Section and include the new language perimeter fire barrier.
The proposal compliments a proposal which reorganizes Section 715.

This proposal is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire safety and hazardous materials in new and existing buildings and facilities and the protection of life and property in wildland urban interface areas. In 2017 the Fire-CAC has held 3 open meetings. In addition, there were numerous conference calls, Regional Work Group and Task Group meetings for the current code development cycle, which included members of the committees as well as any interested parties, to discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: https://www.iccsafe.org/codes-tech-support/cs/fire-code-action-committee-fcac/

Cost Impact: The code change proposal will not increase or decrease the cost of construction
All changes are editorial in nature and as such will not change construction practices.

FS53-18

Public Hearing Results

Committee Action: As Modified

Committee Modification: Modify proposal as follows:
715.4.1 Fire test criteria.

Perimeter fire ~~barriers~~containment systems shall be tested in accordance with the requirements of ASTM E2307.

Exception: Voids created at the intersection of the exterior curtain wall assemblies and floor assemblies where the vision glass extends to the finished floor level shall be permitted to be protected with an approved material to prevent the interior spread of fire. Such material shall be securely installed and capable of preventing the passage of flame and hot gases sufficient to ignite cotton waste where subjected to ASTM E119 time-temperature fire conditions under a minimum positive pressure differential of 0.01 inch (0.254 mm) of water column (2.5 Pa) for the time period not less than the fire-resistance rating of the floor assembly.

Committee Reason: Through the new term and its definition, we now have a common method of identifying what is needed to address voids created by the intersection of exterior curtain wall assemblies and the rated floor/ceiling assemblies. (Vote 13-0)

Assembly Action: None

FS53-18

Individual Consideration Agenda

Public Comment 1:

Proponent: Dustin J. Wakefield, PE, LEED AP, Virginia Department of General Services, representing Bureau of Capital Outlay Managementrequests As Modified by This Public Comment.

Modify as follows:

2018 International Building Code

715.4 Exterior curtain wall/fire-resistance-rated floor intersections. Voids created at the intersection of exterior curtain wall assemblies and fire-resistance-rated floor or floor/ceiling assemblies shall be protected with an *approved* perimeter fire ~~containment system~~ barrier to prevent the interior spread of fire. Such systems shall provide an *F rating* for a time period not less than the *fire-resistance rating* of the floor or floor/ceiling assembly. Height and *fire-resistance* requirements for curtain wall spandrels shall comply with Section
705.8.5.

715.4.1 Fire test criteria. *Perimeter fire* ~~containment systems~~ *barriers* shall be tested in accordance with the requirements of ASTM E2307.

> **Exception:** Voids created at the intersection of the exterior curtain wall assemblies and floor assemblies where the vision glass extends to the finished floor level shall be permitted to be protected with an approved material to prevent the interior spread of fire. Such material shall be securely installed and capable of preventing the passage of flame and hot gases sufficient to ignite cotton waste where subjected to ASTM E119 time-temperature fire conditions under a minimum positive pressure differential of 0.01 inch (0.254 mm) of water column (2.5 Pa) for the time period not less than the *fire-resistance rating* of the floor assembly.

715.8 Joints and voids in smoke barriers. *Fire-resistant joint systems protecting joints* in *smoke barriers*, and *perimeter fire* ~~containment systems~~ *barriers* protecting voids 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 L rating of the joint system shall not exceed 5 cfm per linear foot (0.00775 m^3/s m) of joint at 0.30 inch (74.7 Pa) of water for both the ambient temperature and elevated temperature tests.

[BF] 1705.17 Fire-resistant penetrations and joints. In high-rise buildings or in buildings assigned to *Risk Category* III or IV, *special inspections* for *through-penetrations*, membrane penetration firestops, *fire-resistant joint systems* and perimeter fire ~~containment systems~~ barriers that are tested and *listed* in accordance with Sections 714.4.1.2, 714.5.1.2, 715.3 and 715.4 shall be in accordance with Section 1705.17.1 or 1705.17.2.

PERIMETER FIRE ~~CONTAINMENT SYSTEM.~~BARRIER. An assemblage of specific materials or products that are designed to resist for a prescribed period of time the passage of fire through voids created at the intersection of exterior curtain wall assemblies and fire-resistance-rated floor or floor/ceiling assemblies.

F RATING. The time period that the through-penetration firestop system or perimeter fire ~~containment system~~ barrier limits the spread of fire through the penetration or void.

Commenter's Reason: We do not believe the proposed change of terminology is appropriate. These listed joint systems at the intersection of rated floor assemblies and exterior curtain wall systems are tested in accordance with ASTM E2307 - Standard Test Method for Determining Fire Resistance of Perimeter Fire Barriers Using Intermediate-Scale, Multi-Story Test Apparatus.
The proposal to change the name of these joint systems to Perimeter Fire Containment Systems does not appear to be supported by the code or the referenced standards, rather, this terminology tends to show up in various product manufacturers brochures and literature. Industry terminology should be aligning with the available technical data and governing codes - not the other way around.

It is therefore our opinion that the language in the IBC currently referencing Perimeter Fire Barriers should remain unchanged for consistency throughout the code and with the governing test standards.

Bibliography: https://www.astm.org/Standards/E2307.htm
Link created on 07/12/2018

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
Since this is solely a terminology issue, there is no anticipated cost impact on the design or construction process.

FS53-18

FS54-18

IBC: 715.4, 715.5

Proposed Change as Submitted

Proponent: Michael O'Brian, Chair, representing FCAC (fcac@iccsafe.org)

2018 International Building Code

Revise as follows

715.4 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* system to prevent the interior spread of fire. Such systems shall be securely installed and tested in accordance with ASTM E2307 to provide an *F rating* for a time period not less than the *fire-resistance rating* of the floor assembly. ~~Height and *fire-resistance* requirements for curtain wall spandrels shall comply with Section 705.8.5.~~

> **Exception:** Voids created at the intersection of the exterior curtain wall assemblies and such floor assemblies where the vision glass extends to the finished floor level shall be permitted to be sealed with an approved material to prevent the interior spread of fire. Such material shall be securely installed and capable of preventing the passage of flame and hot gases sufficient to ignite cotton waste where subjected to ASTM E119 time-temperature fire conditions under a minimum positive pressure differential of 0.01 inch (0.254 mm) of water column (2.5 Pa) for the time period not less than the *fire-resistance rating* of the floor assembly.

715.5 ~~Spandrel wall.~~Curtain wall spandrels.. Height and *fire-resistance* requirements for curtain wall spandrels shall comply with Section 705.8.5. Where Section 705.8.5 does not require a fire-resistance-rated spandrel wall, the requirements of ~~Section~~ Sections 715.4 and 715.4.1 shall still apply to the intersection between the spandrel wall and the floor.

Reason: This proposal accomplishes several goals. First, it deletes a redundant reference to Section 705.8.5 from Section 715.4. The same reference is also in Section 715.5 covering curtain wall spandrels. Second, it cleans up inconsistent references to the curtain wall spandrels between the title and the body of Section 715.5. Third, it clarifies that this requirement applies to both the void at the intersection of a fire-resistance-rated floor and the curtain wall, covered in Section 715.4, and the void at the intersection of a nonfire-resistance-rated floor and the curtain wall, covered in Section 715.4.1.
The proposal compliments a proposal which reorganizes Section 715.

This proposal is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire safety and hazardous materials in new and existing buildings and facilities and the protection of life and property in wildland urban interface areas. In 2017 the Fire-CAC has held 3 open meetings. In addition, there were numerous conference calls, Regional Work Group and Task Group meetings for the current code development cycle, which included members of the committees as well as any interested parties, to discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: https://www.iccsafe.org/codes-tech-support/cs/fire-code-action-committee-fcac/

Cost Impact: The code change proposal will not increase or decrease the cost of construction
All changes are editorial in nature and as such will not change construction practices.

FS54-18

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The intent of the proposal was for consistent use of the term 'curtain wall spandrel'. There were at least 2 locations where the needed amendment was not proposed. The proponent is urged to return with a public comment. (Vote 12-1)

Assembly Action: **None**

FS54-18

Individual Consideration Agenda

Public Comment 1:

Proponent: Michael O'Brian, FCAC, representing FCAC (fcac@iccsafe.org)requests As Modified by This Public Comment.

Further modify as follows:

2018 International Building Code

715.4 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* system to prevent the interior spread of fire. Such systems shall be securely installed and tested in accordance with ASTM E2307 to provide an *F rating* for a time period not less than the *fire-resistance rating* of the floor assembly.

> **Exception:** Voids created at the intersection of the exterior curtain wall assemblies and such floor assemblies where the vision glass extends to the finished floor level shall be permitted to be sealed with an approved material to prevent the interior spread of fire. Such material shall be securely installed and capable of preventing the passage of flame and hot gases sufficient to ignite cotton waste where subjected to ASTM E119 time-temperature fire conditions under a minimum positive pressure differential of 0.01 inch (0.254 mm) of water column (2.5 Pa) for the time period not less than the *fire-resistance rating* of the floor assembly.

715.5 Curtain wall spandrels.. Height and *fire-resistance* requirements for curtain wall spandrels shall comply with Section 705.8.5. Where Section 705.8.5 does not require ~~a~~ fire-resistance-rated ~~spandrel~~ curtain wall spandrels , the requirements of Sections 715.4 and 715.4.1 shall still apply to the intersection between the ~~spandrel~~ curtain wall spandrels and the floor.

Commenter's Reason: During the Committee Action Hearings the Fire Safety Committee rightfully pointed out that FS54-18 failed to update two references to curtain wall spandrels in Section 715.5. As such, the proposal was disapproved. This Public Comment corrects those oversights.
This public comment is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire safety and hazardous materials in new and existing buildings and facilities and the protection of life and property in wildland urban interface areas. In 2017 the Fire-CAC has held 3 open meetings and in 2018 FCAC held 2 open meetings. In addition, there were numerous conference calls, Regional Work Group and Task Group meetings for the current code development cycle, which included members of the committees as well as any interested parties, to discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at:
https://www.iccsafe.org/codes-tech-support/cs/fire-code-action-committee-fcac/

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
All changes are editorial in nature and as such will not change construction practices.

FS54-18

FS56-18

IBC: Table TABLE 716.1(2)

Proposed Change as Submitted

Proponent:

Kellie Saylor, OZ Architecture, representing Code Change Committee of Colorado Chapter of the International Code Council (ksaylor@ozarch.com)

2018 International Building Code

Revise as follows

TABLE 716.1(2)

OPENING FIRE PROTECTION ASSEMBLIES, RATINGS AND MARKINGS

TYPE OF ASSEMBLY	**REQUIRED WALL ASSEMBLY RATING (hours)**	**MINIMUM FIRE DOOR AND FIRE SHUTTER ASSEMBLY RATING (hours)**	**DOOR VISION PANEL SIZE[b]**	**FIRE-RATED GLAZING MARKING DOOR VISION PANEL[c, e]**	**MINIMUM SIDELIGHT/TRANSOM ASSEMBLY RATING (hours)**		**FIRE-RATED GLAZING MARKING SIDELIGHT/TRANSOM PANEL**	
					Fire protection	Fire resistance	Fire protection	Fire resistance
Fire walls and fire barriers having a required fire-resistance rating greater than 1 hour	4	3	See Note b	D-H-W-240	Not Permitted	4	Not Permitted	W-240
	3	3a	See Note b	D-H-W-180	Not Permitted	3	Not Permitted	W-180
	2	$1^1/_2$	100 sq. in.	≤100 sq. in. = D-H-90 >100 sq. in.=D-H-W-90	Not Permitted	2	Not Permitted	W-120
	$1^1/_2$	$1^1/_2$	100 sq. in.	≤100 sq. in. = D-H-90 >100 sq. in.= D-H-W-90	Not Permitted	$1^1/_2$	Not Permitted	W-90
Enclosures for shafts, interior exit stairways and interior exit ramps.	2	$1^1/_2$	100 sq. in.[c]	≤100 sq. in. = D-H-90 > 100 sq. in.= D-H-T-W-90	Not Permitted	2	Not Permitted	W-120

Horizontal exits in fire walls[d]	4	3	100 sq. in.	≤100 sq. in. = D-H-180 > 100 sq. in.=D-H-W-240	Not Permitted	4	Not Permitted	W-240
	3	3[a]	100 sq. in.	≤100 sq. in. = D-H-180> 100 sq. in.=D-H-W-180	Not Permitted	3	Not Permitted	W-180
Fire barriers having a required fire-resistancerating of 1 hour:Enclosures forshafts, exit access stairways, exit access ramps, interior exit stairways and interior exit ramps; and exit passageway walls	1	1	100 sq. in.	≤100 sq. in. = D-H-60>100 sq. in.=D-H-T-W-60	Not Permitted	1	Not Permitted	W-60
					Fire protection			
Other fire barriers	1	$^3/_4$	Maximum size tested	D-H	$^3/_4$		D-H	
Fire partitions:Corridor walls	1 0.5	$^1/_3$b $^1/_3$b	Maximum size testedMaximum size tested	D-20 D-20	$^3/_4$b $^1/_3$		D-H-OH-45 D-H-OH-20	
Other fire partitions [f]	1 0.5	3/4$^1/_3$	Maximum size tested Maximum size tested	D-H-45D-H-20	$^3/_4$$^1/_3$		D-H-45 D-H-20	
Exterior walls	3	$1^1/_2$	100 sq. in.[b]	≤100 sq. in. = D-H-90 > 100 sq. in = D-H-W-90	Not Permitted	3	Not Permitted	W-180
	2	$1^1/_2$	Maximum size tested	D-H 90 or D-H-W-90	$1^1/_2$	2	D-H-OH-90	W-120
					Fire protection			
	1	$^3/_4$	Maximum size tested	D-H-45	$^3/_4$		D-H-45	
Smoke barriers					**Fire protection**			
	1	$^1/_3$	Maximum size tested	D-20	$^3/_4$		D-H-OH-45	

For SI: 1 square inch = 645.2 mm.

a. Two doors, each with a fire protection rating of $1^1/_2$ hours, installed on opposite sides of the same opening in a fire wall, shall be deemed equivalent in fire protection rating to one 3-hour fire door.
b. Fire-resistance-rated glazing tested to ASTM E119 in accordance with Section 716.1.2.3 shall be permitted, in the maximum size tested.
c. Under the column heading "Fire-rated glazing marking door vision panel," W refers to the fire-resistance rating of the glazing, not the frame.
d. See Section 716.2.5.1.2.1.
e. See Section 716.1.2.2.1 and Table 716.1(1) for additional permitted markings.
f. Two doors installed on opposite sides of the same opening in a fire partition shall both comply with the requirements in Table 716.1(2).

Reason:

Two doors installed on opposite sides of the same opening in a fire partition are common in adjoining hotel rooms. Currently the code is silent on the requirements for this type of "communicating" door. NFPA 101 states that only one door must be rated at a guest-to-guest room opening and some AHJ's rely on this as an interpretation since the IBC is silent. However, if only one door were rated and it was open when a fire started then the fire partition separating the rooms would be compromised. This code change proposal adds a footnote to Table 716.1(2) to indicate that both doors must be rated when installed on opposite sides of the same opening. This footnote is applied in the table under the Type of Assembly column at the row for "Other fire partitions".

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

The code change proposal will not increase or decrease the cost of construction. This code change proposal is only making a requirement more clear for a specific application. It is reasonable to assume that this is how the code is typically enforced for this application anyways so there will likely not be an increase or decrease in the cost of construction. .

FS56-18

Public Hearing Results

Errata:

A clearer version of the table was provided.

Committee Action: Disapproved

Committee Reason:

There is no documentation of the two door design being an issue in the field. As the design is usually limited to connection just 2 guest rooms, the concern over fire spread is exaggerated. (Vote 8-6)

Assembly Action: None

FS56-18

Individual Consideration Agenda

Public Comment 1:

Proponent:

Matt Archer, City of Lone Tree, representing City of Lone Tree (matt.archer@cityoflonetree.com) requests As Modified by This Public Comment

.

Replace as follows:

2018 International Building Code

TABLE 716.1(2)

OPENING FIRE PROTECTION ASSEMBLIES, RATINGS AND MARKINGS

TYPE OF ASSEMBLY	REQUIRED WALL ASSEMBLY RATING (hours)	MINIMUM FIRE DOOR AND FIRE SHUTTER ASSEMBLY RATING (hours)	DOOR VISION PANEL SIZE[b]	FIRE-RATED GLAZING MARKING DOOR VISION PANEL[c, e]	MINIMUM SIDELIGHT/TRANSOM ASSEMBLY RATING (hours)		FIRE-RATED GLAZING MARKING SIDELIGHT/TRANSOM PANEL	
					Fire protection	Fire resistance	Fire protection	Fire resistance
Fire walls and fire barriers having a required fire-resistance rating greater than 1 hour	4	3	See Note b	D-H-W-240	Not Permitted	4	Not Permitted	W-240
	3	3a	See Note b	D-H-W-180	Not Permitted	3	Not Permitted	W-180
	2	$1^1/_2$	100 sq. in.	≤100 sq. in. = D-H-90 >100 sq. in.=D-H-W-90	Not Permitted	2	Not Permitted	W-120
	$1^1/_2$	$1^1/_2$	100 sq. in.	≤100 sq. in. = D-H-90 >100 sq. in.= D-H-W-90	Not Permitted	$1^1/_2$	Not Permitted	W-90
Enclosures for shafts, interior exit stairways and interior exit ramps.	2	$1^1/_2$	100 sq. in.[c]	≤100 sq. in. = D-H-90 > 100 sq. in.= D-H-T-W-90	Not Permitted	2	Not Permitted	W-120

TYPE OF ASSEMBLY	REQUIRED WALL ASSEMBLY RATING (hours)	MINIMUM FIRE DOOR AND FIRE SHUTTER ASSEMBLY RATING (hours)	DOOR VISION PANEL SIZE[b]	FIRE-RATED GLAZING MARKING DOOR VISION PANEL[c, e]	MINIMUM SIDELIGHT/TRANSOM ASSEMBLY RATING (hours)		FIRE-RATED GLAZING MARKING SIDELIGHT/TRANSOM PANEL	
					Fire protection	Fire resistance	Fire protection	Fire resistance
Horizontal exits in fire walls[d]	4	3	100 sq. in.	≤100 sq. in. = D-H-180 > 100 sq. in.=D-H-W-240	Not Permitted	4	Not Permitted	W-240
	3	3[a]	100 sq. in.	≤100 sq. in. = D-H-180> 100 sq. in.=D-H-W-180	Not Permitted	3	Not Permitted	W-180
Fire barriers having a required fire-resistancerating of 1 hour:Enclosures forshafts, exit access stairways, exit access ramps, interior exit stairways and interior exit ramps; and exit passageway walls	1	1	100 sq. in.	≤100 sq. in. = D-H-60>100 sq. in.=D-H-T-W-60	Not Permitted	1	Not Permitted	W-60
					Fire protection			
Other fire barriers	1	$^3/_4$	Maximum size tested	D-H	$^3/_4$		D-H	
Fire partitions:Corridor walls	1 0.5	$^1/_3$b $^1/_3$b	Maximum size testedMaximum size tested	D-20 D-20	$^3/_4$b $^1/_3$		D-H-OH-45 D-H-OH-20	
Other fire partitions [f]	1 0.5	$^3/_4$ [f] $^1/_3$	Maximum size tested Maximum size tested	D-H-45D-H-20	$^3/_4$ $^1/_3$		D-H-45 D-H-20	
Exterior walls	3	$1^1/_2$	100 sq. in.[b]	≤100 sq. in. = D-H-90 > 100 sq. in = D-H-W-90	Not Permitted	3	Not Permitted	W-180
	2	$1^1/_2$	Maximum size tested	D-H 90 or D-H-W-90	$1^1/_2$	2	D-H-OH-90	W-120
					Fire protection			

TYPE OF ASSEMBLY	REQUIRED WALL ASSEMBLY RATING (hours)	MINIMUM FIRE DOOR AND FIRE SHUTTER ASSEMBLY RATING (hours)	DOOR VISION PANEL SIZE[b]	FIRE-RATED GLAZING MARKING DOOR VISION PANEL[c, e]	MINIMUM SIDELIGHT/TRANSOM ASSEMBLY RATING (hours)		FIRE-RATED GLAZING MARKING SIDELIGHT/TRANSOM PANEL	
					Fire protection	Fire resistance	Fire protection	Fire resistance
	1	$^3/_4$	Maximum size tested	D-H-45	$^3/_4$		D-H-45	
Smoke barriers					**Fire protection**			
	1	$^1/_3$	Maximum size tested	D-20	$^3/_4$		D-H-OH-45	

For SI: 1 square inch = 645.2 mm.

a. Two doors, each with a fire protection rating of $1^1/_2$ hours, installed on opposite sides of the same opening in a fire wall, shall be deemed equivalent in fire protection rating to one 3-hour fire door.
b. Fire-resistance-rated glazing tested to ASTM E119 in accordance with Section 716.1.2.3 shall be permitted, in the maximum size tested.
c. Under the column heading Fire-rated glazing marking door vision panel, W refers to the fire-resistance rating of the glazing, not the frame.
d. See Section 716.2.5.1.2.1.
e. See Section 716.1.2.2.1 and Table 716.1(1) for additional permitted markings.
f. Two doors, each with a fire rating of 20 minutes, installed on opposite sides of the same opening in a fire partition, shall be deemed equivalent in fire protection rating to one 45 minute fire door.

Commenter's Reason:

This is to add clarification to existing text for situations when you have a series of doors in a rated partition, like you would see in a pass between shared hotel rooms. Based on the committee comments, they felt that if you had two 20 minute rated doors in the single frame in one hour fire partition between hotel rooms they would be equivalent to the 45 minute rated door assembly that is required in Table 716.1 (2). This new footnote would take the place of the new footnote language in the original proposal which would require both doors to be 45 minute rated.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction

This code change proposal is only making a requirement more clear for a specific application. It is reasonable to assume that this is how the code is typically enforced for this application anyways so there will likely not be an increase or decrease in the cost of construction.

Public Comment 2:

Proponent:

Timothy Pate, representing Colorado Chapter Code Change Committee (tpate@broomfield.org) requests As Submitted

.

Commenter's Reason:

This public comment is to request membership to overturn the committee and approve the original proposal. The proposal was to add clarification to the existing code to show that when you have a set of connector doors between adjoining hotel rooms they both need to be 45 minute rated. These walls are fire partitions and the only time you can have 20 minute rated doors is when they open into the fire rated corridor. All other doors in one hour rated fire partitions as per Table 716.1 (2) are required to be 45 minute rated. Some of the committee statements were that these doors are typically both closed when rooms are not rented together so if both were 20 minute rated then it would still provide adequate protection. I have researched and not been able to find any rated door and frame assemblies that have two 20 minute rated doors in a single frame that would get a 45 minute rating. I believe that it is important to provide the proper fire protected separation between hotel rooms especially considering the transient population that uses these rooms and are not familiar with their surroundings. It is always possible that one of these doors could be left open even though the other door is locked from the other side. In these cases you would only get the 20 minute rated separation at this opening. I have reviewed many hotel plans and they always show these connector doors to both be 45 minute rated so it is apparent that these national architects believe that is what the code intends.

I urge the membership to overturn the committee and approve the original proposal ass submitted.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction

This is just to clarify the existing code requirements

FS56-18

FS60-18

IBC: 202, 202, 716.2.2.1.1

Proposed Change as Submitted

Proponent: John Woestman, Kellen Co., representing Builders Hardware Manufacturers Association (BHMA) (jwoestman@kellencompany.com)

2018 International Building Code

SECTION 202 DEFINITIONS

Add new definition as follows

TERMINATED STOPS. Factory feature of a door frame where the stops of the door frame are terminated not more than 6 inches from the bottom of the door frame. Terminated stops are also known as "hospital stops" or "sanitary stops".

Revise as follows

716.2.2.1.1 Smoke and draft control. The air leakage rate of the door assembly shall not exceed 3.0 cubic feet per minute per square foot (0.01524 $m^3/s \times m^2$) 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. Terminated stops shall be prohibited on doors required by Section 405.4.3 to comply with Section 716.2.2.1 and prohibited on doors required by Section 3006.3 Item 3, 3007.6.3, or 3008.6.3 to comply with Section 716.2.2.1.1.

Reason: The code today is silent regarding door frames with terminated stops. Interior door frames in many buildings have terminated stops, especially – but not only in – health care facilities. Some interior door frames in business occupancies, and other occupancies, may also have terminated stops.
Unfortunately, the IBC currently does not include an important requirement that door assemblies required to meet the testing requirements of UL1784 when tested without an artificial bottom seal, as required in IBC Sections 405.4.3, 3006.3(3), 3007.6.3, and 3008.6.3, should be prohibited from using door frames with terminated stops. This proposal addresses this oversight.

For other smoke and draft control door assemblies required to be tested to UL1784, this proposal is consistent with the testing requirements of UL 1784.

Terminated stops are a factory feature of a door frame, where the stops are terminated above the floor. The bottom of the stop is closed at a 45-degree or 90-degree angle. The purpose of terminated stops is to make it easier to clean that area of the floor without the extra corners to catch debris or pathogens, and to avoid getting moveable items caught on the stop. Terminated stops are also known as "hospital stops" or "sanitary stops."

Door frame with terminated stop.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal addresses what is currently allowed and prohibited in the code, but not explicitly "spelled out".

FS60-18

Public Hearing Results

Committee Action: **As Submitted**

Committee Reason: The committee was convinced by the proponent's reasons statement. In addition, the doors are seeing wide ranging use in health care occupancies without documented issued. (Vote 11-3)

Assembly Action: **None**

FS60-18

Individual Consideration Agenda

Public Comment 1:

Proponent: Keith Pardoe, representing Pardoe Consulting, LLC (kpardoe@pardoeconsultingllc.com)requests As Modified by This Public Comment.

Modify as follows:

2018 International Building Code

SECTION 202 DEFINITIONS

TERMINATED STOPS. Factory feature of a door frame where the stops of the door frame are terminated not more than 6 inches from the bottom of the door frame. Terminated stops are also known as "hospital stops" or "sanitary stops".

716.2.2.1.1 Smoke and draft control. The air leakage rate of the door assembly shall not exceed 3.0 cubic feet per minute per square foot (0.01524 m^3/s~~-~~x 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.

Exceptions:

1. Doors ~~Terminated stops shall be prohibited on doors~~ required by Section 405.4.3 shall not be permitted to have door frames with terminated stops..
2. Doors required by Sections ~~to comply with Section 716.2.2.1 and prohibited on doors required by Section~~ 3006.3 Item 3, 3007.6.3, or 3008.6.3 ~~to comply with Section 716.2.2.1.1~~ shall not be permitted to have door frames with terminated stops.

Commenter's Reason: See Public Input 257, regarding FS60-18.
I recommend the committee consider approving the changes presented in this public input for the following reasons:

1) The change presented in FS60-18 is intended to address exceptions to the standard method of testing the air leakage-rate around swinging doors. That is to say, that in most applications the doors are permitted to be tested with an artificial door bottom that can extend up as much as 6 inches from the bottom of the door frames. When tested with an artificial door bottom seal, the door frames can have terminated stops.

2) There are several conditions where smoke and draft controls doors are used that require the air leakage-rate tests to be performed WITHOUT the artificial door bottom seal. Such conditions are elevator shafts, elevator lobby doors, etc. as pointed to by the references to sections 405.4.3, 3006.3 Item 3, 3007.6.3, and 3008.6.3 that specifically state the UL 1784 test shall be conducted WITHOUT an artificial door bottom seal.

3) Since above referenced sections are exceptions to the standard method of testing, they should be separated from the main provision of 716.2.2.1.1 and appropriately listed as being exceptions.

4) Another reason for separating terminated stops from the main provision is that terminated stops are not referenced in UL 1784, and it would likely create confusion among users in the field; leading to misapplication of these limited exceptions.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction

Approving this modification will not have a cost impact.

Public Comment 2:

Proponent: Keith Pardoe, Pardoe Consulting, LLC, representing Pardoe Consulting, LLCrequests Disapprove.

Commenter's Reason: Please refer to PC 305 regarding FS60-18.
I recommend the committee disapprove this proposed change in it s current form for the following reasons:

1) The placement and phrasing of the proposed change might create confusion as to where door frames of smoke and draft controls doors are permitted to have terminated stops. The proposed change addresses an exception to 716.2.2.1.1, which relies on users of the code to lookup the referenced sections. Some users of the code might assume the prohibition of terminated stops applies to all smoke and draft control doors, which is not the intent of this proposal.

2) NFPA 105, Standard for Smoke Door Assemblies and Other Opening Protectives (2016) edition, specifically section 6.3.2.2 permits the door frames to have terminated stops.

6.3.2.2 Door frames with terminated stops shall be permitted, provided the lowest portion of the terminated stops is not greater than 6 in. (152 mm) above the bottom of the frame.*

A.6.3.2.2 Door stops in the door frames are necessary elements that provide support for the installation of gasketing materials. Door frames with terminated stops are sometimes used in rooms or spaces where the floors are subject frequent cleaning. Terminated stops convert the lowest portion of the door frames to flat profile, eliminating corners where dirt and debris might be trapped. In these cases, smoke and draft control gasketing should extend the full height of the shortened frame soffit or door stop. See Figure A.6.3.2.2.

3) NFPA 105 requires smoked door assemblies to be tested in accordance with UL 1784, which apply to fire rated and non-fire rated smoke door assemblies. Where the IBC or other building codes reference the UL 1784 test do not prohibit the use of an artificial door bottom during the tests the door frames are permitted to have terminated stops. The artificial door bottom referred to in the proposal s reason statement, is a device that is used during the UL 1784 test to seal the bottom of the door assembly in order to more accurately measure the air-leakage rate along the vertical and top edges of the doors. (It is a piece of duct tape, in many cases.) More importantly, it is not a physical component that is installed on doors in the field.

4) Smoke and Draft Control doors do not require any type of gasketing or seal at door bottoms unless the doors are installed in a pressurized area (e.g., stair tower with smoke evacuation systems) as specified in NFPA 105 (See item 5.2.4.4.2 (6) and 6.7.1.4). In the case of swinging doors installed in elevator shafts and elevator lobbies, the neutral plane of a fire within the shafts might be below the floor level of doors serving these areas. Consequently, the IBC requires smoke and draft control doors in these applications to be tested without an artificial bottom seal, which means that door frames with cannot have terminated stops; and, the gasketing materials must form a continuous seal the along the full height of the doors.

5) An alternate version of this change is presented in PC 305.

FS60-18

FS73-18

IBC: 718.2.1

Proposed Change as Submitted

Proponent: Stephen DiGiovanni, representing ICC Ad Hoc Committee on Tall Wood Buildings (TWB) (TWB@iccsafe.org)

THIS CODE CHANGE WILL BE HEARD BY THE IBC GENERAL COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THIS COMMITTEE.

2018 International Building Code

Revise as follows

718.2.1 Fireblocking materials. *Fireblocking* shall consist of the following materials:

1. Two-inch (51 mm) nominal lumber.
2. Two thicknesses of 1-inch (25 mm) nominal lumber with broken lap joints.
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.
4. One thickness of 0.75-inch (19.1 mm) particleboard with joints backed by 0.75-inch (19 mm) particleboard.
5. One-half-inch (12.7 mm) gypsum board.
6. One-fourth-inch (6.4 mm) cement-based millboard.
7. Batts or blankets of mineral wool, mineral fiber or other *approved* materials installed in such a manner as to be securely retained in place.
8. Cellulose insulation installed as tested for the specific application.
9. Mass timber complying with Section 2304.11.

Reason: The Ad Hoc Committee on Tall Wood Buildings (TWB) was created by the ICC Board to explore the science of tall wood buildings and take action on developing code changes for tall wood buildings. The TWB has created several code change proposals with respect to the concept of tall buildings of mass timber and the background information is at the end of this Statement. Within the statement are important links to information, including documents and videos, used in the deliberations which resulted in these proposals.
The purpose of this code change proposal is to recognize that mass timber as a suitable fireblocking material. The current list of acceptable materials lists “nominal lumber”, therefore since mass timber (e.g. Sawn, glued-laminated, and cross laminated timbers) are of greater mass the correlation from single nominal lumber to mass timber was determined to be of equal or greater blocking resistance to reduce the ability of fire, smoke and gasses from moving to different part of the building through combustible concealed spaces.

Background information: The ICC Board approved the establishment of an ad hoc committee for tall wood buildings in December of 2015. The purpose of the ad hoc committee is to explore the science of tall wood buildings and to investigate the feasibility and take action on developing code changes for tall wood buildings. The committee is comprised of a balance of stakeholders with additional opportunities for interested parties to participate in the four Work Groups established by the ad hoc committee, namely: Code; Fire; Standards/Definitions; and Structural. For more information, be sure to visit the ICC website https://www.iccsafe.org/codes-tech-support/cs/icc-ad-hoc-committee-on-tall-wood-buildings/ (link active and up to date as of 12/27/17). As seen in the “Meeting Minutes and Documents” and “Resource Documents” sections of the committee web page, the ad hoc committee reviewed a substantial amount of information in order to provide technical justification for code proposals.

The ad hoc committee developed proposals for the followings code sections. The committee believes this package of code changes will result in regulations that adequately address the fire and life safety issues of tall mass timber buildings.

IBC Code Section	Description
403.3.2	Water supply requirements for fire pumps in high rise buildings of Type IVA and IVB construction.
504.3	Allowable building height (feet) for buildings of Type IVA, IVB and IVC construction. No changes to Type IV HT construction.
504.4	Allowable building height (stories) for buildings of Type IVA, IVB and IVC construction. No changes to Type IV HT.
506.2	Allowable building area for buildings of Type IVA, IVB and IVC construction. No changes to Type IV HT.
508.4.4.1 509.4.1.1 (new)	Requirements for mass timber building elements serving as fire barriers or horizontal assemblies in buildings of Type IVB of IVC construction.
602.4	Type of Construction requirements for new proposed types of construction: Types IVA, IVB and IVC. No changes to Type IV HT construction. Includes definitions for new terms: Mass timber and Noncombustible protection (mass timber). **THIS IS THE KEY CODE CHANGE PROPOSAL WHICH OUTLINES THE CONSTRUCTION REQUIREMENTS FOR THE PROPOSED NEW TYPE OF MASS TIMBER BUILDINGS. THE PROPOSAL ALSO ADDRESSES CONCEALED SPACES, ADHESIVE PERFORMANCE AND EXTERIOR WALL PROTECTION.**
703.8 (new)	The performance method to determine the increase to the fire resistance rating provided by noncombustible protection applied to the mass timber building element.
703.9 (new)	Requirements for sealants and adhesives to be placed at abutting edges and intersections of mass timber building elements. The reason statement references a Group B proposal to Chapter 17 for special inspection requirements of sealants and adhesives.
718.2.1	Requirements on the use of mass timber building elements used for Fireblocking.
722.7 (new)	Requirements for the fire resistance rating of mass timber elements, including minimum required protection and gypsum board attachment requirements.
3102	Requirements for membrane structures using Type IV HT construction.
Appendix	Requirements for walls, floors and roofs of Type IV HT construction in buildings located in Fire Districts.
IFC Code Section	**Description**
701.6	Requirements which stipulate the owner's responsibility to maintain inventory of all required fire resistance rated construction in buildings of Types IVA and IVB construction. This includes an annual inspection and proper repair where necessary.
3308.4 (new)	New special precautions during construction of buildings of Types IVA, IVB and IVC construction: Standpipes; Water supply for fire department connections; Noncombustible protection required for mass timber elements as construction height increases.
Proposed changes to be submitted in 2019 Group B	
IBC Chapter 17	Required special inspections of mass timber construction • Structural • Sealants and adhesives (see IBC 703.8)
IBC Chapter 23	An update to referenced standard APA PRG 320 Standard for Performance –rated Cross-laminated Timber which is currently undergoing revision to ensure the adequacy of the adhesives under fire conditions.

In addition, fire tests designed to simulate the three new construction types (Types IVA, IVB and IVC) in the ad hoc committee proposals were conducted at the Alcohol Tobacco and Firearms test lab facility. The TWB was involved in the design of the tests, and many members witnessed the test in person or online. The results of the series of 5 fire tests provide additional support for these proposals, and validate the fire performance for each of the types of construction proposed by the committee. The fire tests consisted of one-bedroom apartments on two levels, with both apartments having a corridor leading to a stair. The purpose of the tests was to address the contribution of mass timber to a fire, the performance of connections, the performance of through-penetration fire stops, and to evaluate conditions for responding fire personnel.

To review a summary of the fire tests, please visit http://bit.ly/ATF-firetestreport

To watch summary videos of the fire tests, please visit http://bit.ly/ATF-firetestvideos

Both of these links were confirmed active on 12/27/17.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This section provides information that was not previously set forth in the code, and does not change the requirements of current code, thus there is no cost impact when compared with present requirements.

FS73-18

Public Hearing Results

Committee Action: **As Submitted**

Committee Reason: Mass timber is acceptable for fire blocking given the other materials on the list. (Vote: 14-0)

Assembly Action: **None**

FS73-18

Individual Consideration Agenda

Public Comment 1:

Proponent: Dan Nichols, representing ICC Code Correlation Committee (ccc@iccsafe.org).

Commenter's Reason: The Code Correlation Committee (CCC) is not taking a position on this code change. The CCC submitted this public comment in order to bring a correlation issue to the attention of the full voting membership for the Public Comment Hearings and the Online Governmental Consensus Vote to allow the voting membership to coordinate actions on a package of code changes submitted dealing with tall wood buildings of mass timber construction. This package includes the parent proposal G108-18; if disapproved, the related proposals G28-18, G75-18, G80-18, G84-18, G89-18, FS5-18, FS6-18, FS73-18, FS81-18 and F266-18, will not be correlated with any existing code text if they are approved.
The Code Correlation Committee is a standing committee of the International Code Council whose objectives, procedures and organization are set forth in Council Policy CP#44-13. The objective of the Code Correlation Committee is to maintain technical and editorial consistency among the International Codes and to assist staff in the evaluation and processing of code change proposals and comments that are exclusively editorial.

FS73-18

FS74-18

IBC: 718.2.6, 1402.5, 1406,1406.10.4, 1408.10.4, 2603.5.5, Chapter 35

Proposed Change as Submitted

Proponent: John Harrington, FM Global, representing FM Global (john.harrington@fmglobal.com)

2018 International Building Code

Revise as follows

718.2.6 Exterior wall coverings. *Fireblocking* shall be installed within concealed spaces of exterior wall coverings and other exterior architectural elements where permitted to be of combustible construction as specified in Section 1405 or where erected with combustible frames. *Fireblocking* shall be installed at maximum intervals of 20 feet (6096 mm) in either dimension so that there will be no concealed space exceeding 100 square feet (9.3 m^2) between *fireblocking*. Where wood furring strips are used, they shall be of *approved* wood of natural decay resistance or preservative-treated wood. If noncontinuous, such elements shall have closed ends, with not less than 4 inches (102 mm) of separation between sections.

Exceptions:

1. *Fireblocking* of cornices is not required in single-family dwellings. *Fireblocking* of cornices of a two-family dwelling is required only at the line of dwelling unit separation.
2. *Fireblocking* shall not be required where the exterior wall covering is installed on noncombustible framing and the face of the exterior wall covering exposed to the concealed space is covered by one of the following materials:

   2.1. Aluminum having a minimum thickness of 0.019 inch (0.5 mm).
   2.2. Corrosion-resistant steel having a base metal thickness not less than 0.016 inch (0.4 mm) at any point.
   2.3. Other *approved* noncombustible materials.
3. *Fireblocking* shall not be required where the exterior wall covering has been tested in accordance with, and complies with the acceptance criteria of, NFPA 285, or the 16 foot parallel panel test as described in ANSI/FM 4880. The exterior wall covering shall be installed as tested in accordance with NFPA 285, or the 16 foot parallel panel test per ANSI/FM 4880.

1402.5 Vertical and lateral flame propagation. *Exterior walls* on buildings of Type I, II, III or IV construction that are greater than 40 feet (12 192 mm) in height above grade plane and contain a combustible *water-resistive barrier* shall be tested in accordance with and comply with the acceptance criteria of NFPA 285, or the 16 foot (4877 mm) parallel panel test as described in ANSI/FM 4880. For the purposes of this section, *fenestration* products, flashing of *fenestration* products and *water-resistive-barrier* flashing and accessories at other locations, including through wall flashings, shall not be considered part of the *water-resistive barrier*.

Exceptions:

1. Walls in which the *water-resistive barrier* is the only combustible component and the *exterior wall* has a wall covering of brick, concrete, stone, terra cotta, stucco or steel with minimum thicknesses in accordance with Table 1404.2.
2. Walls in which the *water-resistive barrier* is the only combustible component and the *water-resistive barrier* has a peak heat release rate of less than 150 kW/m^2, a total heat release of less than 20 MJ/m^2 and an effective heat of combustion of less than 18 MJ/kg as determined in accordance with ASTM E1354 and has a flame spread index of 25 or less and a smoke-developed index of 450 or less as determined in accordance with ASTM E84 or UL 723. The ASTM E1354 test shall be conducted on specimens at the thickness intended for use, in the horizontal orientation and at an incident radiant heat flux of 50 kW/m^2.

1406.10.4 Full-scale tests. The MCM system shall be tested in accordance with, and comply with, the acceptance criteria of either NFPA–285, or the 16 foot parallel panel test as described in ANSI/FM 4880. Such testing shall be performed on the MCM system with the MCM in the maximum thickness intended for use.

1408.10.4 Full-scale tests. The HPL system shall be tested in accordance with, and comply with, the acceptance

criteria of either NFPA 285 ~~.~~ or the 16 foot parallel panel test as described in ANSI/FM 4880. Such testing shall be performed on the HPL system with the HPL in the minimum and maximum thicknesses intended for use.

2603.5.5 Vertical and lateral fire propagation. The exterior wall assembly shall be tested in accordance with and comply with the acceptance criteria of either NFPA 285 or the 16 foot parallel panel test as described in ANSI/FM 4880.

Exceptions:

1. One-story buildings complying with Section 2603.4.1.4.
2. Wall assemblies where the foam plastic insulation is covered on each face by not less than 1-inch (25 mm) thickness of masonry or concrete and meeting one of the following:

   2.1. There is no airspace between the insulation and the concrete or masonry.
   2.2. The insulation has a flame spread index of not more than 25 as determined in accordance with ASTM E84 or UL 723 and the maximum airspace between the insulation and the concrete or masonry is not more than 1 inch (25 mm).

Update standard(s) as follows

CHAPTER 35 REFERENCED STANDARDS

FM

FM Approvals
Headquarters Office 1151 Boston-
Providence Turnpike P.O. Box 9102
Norwood MA 02062

4880-~~2015~~2017:

Approval Standard for Class 1 Fire Rating of Building Panels or Interior Finish Materials

Reason: ANSI/FM 4880 is a consensus fire test standard that can be used to test fire exposure to the interior side or exterior side of exterior walls. The 16 ft parallel panel test is described in ANSI/FM 4880. The 16 ft parallel panel test as an alternative to the NFPA 285 test will not result in a related cost increase.

Bibliography: Agarwal, Gaurav, "Evaluation of the Fire Performance of Aluminum Composite Material (ACM) Assemblies using ANSI/FM 4880, FM Global Research Technical Report, December 20017.
Nam,Soonil and Bill, Robert G Jr. "A New Intermediate-scale Fire Test for Evaluating Building Material Flammability", SFPE Journal of Fire Protection Engineering, Feb 2009

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposal offers another method to determine use of the exception. No affect on cost of construction.

Analysis: A review of the standard proposed for inclusion in the code, FM 4880-2017, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2018. The 2015 edition of the standard is currently referenced. This proposal increases the use of the standard as well as proposes to go to the 2017 edition.

FS74-18

Public Hearing Results

Errata: The published proposal failed to include Section 1406.10.4 which was part of the proponent's submttal.

1406.10.4 Full-scale tests.

The MCM system shall be tested in accordance with, and comply with, the acceptance criteria of either NFPA 285, or the 16 foot parallel panel test as described in ANSI/FM 4880. Such testing shall be performed on the MCM system with the MCM in the maximum thickness intended for use.

Committee Action: Disapproved

Committee Reason: There has not been sufficient testing of the new standard to provide clear answers. It is not equivalent to NFPA 285. The criteria in NFPA are clear and understood. There needs to be a broader range of testing. (Vote 14-0)

Assembly Action: None

FS74-18

Individual Consideration Agenda

Public Comment 1:

Proponent: John Harrington, representing FM Global (john.harrington@fmglobal.com)requests As Modified by This Public Comment.

Replace as follows:

2018 International Building Code

1406.10.4 Full-scale tests. The MCM system shall be tested in accordance with, and comply with, the acceptance criteria of either NFPA 285, or the 16 foot parallel panel test as described in ANSI/FM 4880.. Such testing shall be performed on the MCM system with the MCM in the maximum thickness intended for use.

1408.10.4 Full-scale tests. The HPL system shall be tested in accordance with, and comply with, the acceptance criteria of either NFPA 285 or the 16 foot parallel panel test as described in ANSI/FM 4880. Such testing shall be performed on the HPL system with the HPL in the minimum and maximum thicknesses intended for use.

Commenter's Reason: 4880 is a consensus fire that can be used to test fire exposure to the interior or exterior side of exterior walls. ANSI/FM 4881 is also a standard that refers to just exterior panels and within FM 4881 it points to ANSI/FM 4880 for the fire test requirements. ANSI/FM 4881 is a standard that will be introduced during this cycle with the Group B code proposals for reference standards to be included within ICC. The 16 ft parallel panel fire test is correlated to the 50 ft FM corner test and tests an inside re-entrant corner of the wall configuration. It uses a larger heat flux consistent for external fire exposures and also covers the lesser heat flux form an interior fire exposure. The parallel panel test does not look like a building configuration because it is a smaller scale test designed to recreate fire exposure created in a large scale fire with inside corners and larger heat flux exposure, and when you scale it down you need to modify the panels arrangement to recreate the needed heat flux. ANSI/FM 4880 and ANSI/FM 4881 can be run by any testing lab. The 16 ft parallel panel test is not a replacement for NFPA 285, it is another tool for the code to use to ensure buildings are built to limit fire spread when conditions beyond a flat exterior wall may exist.

Bibliography: No cost impact from this proposal.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction

The proposal offers another method to determine use of the exception. No affect on cost of construction.

Public Comment 2:

Proponent: Justin Koscher, Polyisocyanurate Insulation Manufacturers Association (jkoscher@pima.org); John Woestman, Kellen Company, representing Extruded Polystyrene Foam Association (jwoestman@kellencompany.org);Jay Crandell, ARES Consulting, representing Foam Sheathing Committee of the American Chemistry Council

(jcrandell@aresconsulting.biz)requests Disapprove.

Commenter's Reason: Please uphold the unanimous ICC Fire Safety Code Committee action for disapproval. In reaching its decision, the Committee cited the need for more research to fully assess the equivalency of NFPA 285 and the FM 4880 16-foot Parallel Panel Test (FM 4880 16' PPT). The proponent fails to provide sufficient supporting evidence and test data in order to prove that the FM 4880 16' PPT should be approved as an alternative method to the NFPA 285 test standard in the IBC. For example, the submitted justification contained a technical report that described only seven wall assemblies tested in accordance with FM 4880 16' PPT. The review then compared these results to similar assemblies evaluated using NFPA 285. Only four of these assemblies were actually tested to the NFPA 285 standard. The other three assemblies were evaluated by the proponent using data from engineering analyses.

Additionally, in June 2018, the NFPA Standards Council approved the NFPA Fire Test Committee's request to establish a new project to evaluate the suitability of the FM 4880 16' PPT as an alternative to NFPA 285, subject to two conditions: (1) window openings – or the lack thereof within the FM 4880 16' PPT – will need to be addressed; and (2) whether the application of any new document will be mandated by the Codes. Given these developments, the NFPA Fire Test Committee should be allowed to complete its work before ICC voting members give further consideration to this concept. Therefore, the proposal should be disapproved.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
None.

FS74-18

FS78-18

IBC: 722.2.3

Proposed Change as Submitted

Proponent: Michael Hill, representing Self

2018 International Building Code

Revise as follows

722.2.3 Concrete cover over reinforcement. The minimum thickness of concrete cover over reinforcement in concrete slabs, reinforced beams and prestressed beams shall comply with this section. The structural capacity of concrete slabs, reinforced beams and prestressed beams at elevated temperatures shall be determined by calculation.

Reason: Many engineers, architects and building officials do not fully understand the difference between the tables in sections 721 and 722. The proposed addition of text to this section will reinforce the requirement for the design professional to determine the capacity of the concrete members at elevated temperatures by engineering calculations.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Clarification only

FS78-18

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The proposal appears to be addressing structural capacity in the provisions regarding fire resistance. It adds an analysis that is not now required. This will add costs. It appears to be located in the wrong location of the code.. The existing section is about concrete cover, the code change is about structural strength. (Vote 14-0)

Assembly Action: **None**

FS78-18

Individual Consideration Agenda

Public Comment 1:

Proponent: Michael Hill, City of San Diego, representing City of San Diegorequests As Modified by This Public Comment.

Modify as follows:

2018 International Building Code

722.2.3 Concrete cover over reinforcement. The minimum thickness of concrete cover over reinforcement in concrete slabs, reinforced beams and prestressed beams shall comply with this section. The structural capacity of concrete slabs, reinforced beams and prestressed beams at elevated temperatures shall be determined by calculation as required by Section 722.1 and ACI 216.1/TMS 0216.

Commenter's Reason: The two measures for designing structural elements for fire resistance are limiting heat transmission and provide sufficient strength to prevent collapse in fire conditions. These measures are known as the heat transmission endpoint and the structural endpoint. The methods in Chapter 722 consider heat transmission endpoint by requiring sufficient mass (thickness) to prevent heat transmission to the opposite side of the element, but the structural endpoint is not considered in the minimum cover tables. This proposal would provide a pointer to the designer to address the structural requirements.
In response to the committee's opinion that the proposal should be located in a structural section, the provisions and procedures in ICC Section 722 including Tables 722.2.3(1) and 722.2.3(2) can be used to establish the fire resistance rating of materials and assemblies by calculation in lieu of the prescriptive requirements of ICC Section 721. Although structural requirements are usually found in the material chapters, the structural requirements for fire rated construction are not addressed in any other section of the ICC.

In response to the committee's opinion that this proposal will increase construction costs, the proposal is revised to provide additional reference to existing structural requirements. The proposal does not require any additional analysis above what is already required by ICC Section 722.1. ICC Section 722.1 permits the calculated fire resistance of concrete, concrete masonry and clay masonry in accordance with ACI 216.1/TMS 0216.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
The proposed code change is for clarification only. The proposal does not require any analysis beyond what is already required by ICC Section 722.1.

Public Comment 2:

Proponent: Michael Hill, representing City of San Diego (mik1lyn@earthlink.net)requests As Submitted.

Commenter's Reason: The two measures for designing structural elements for fire resistance are limiting heat transmission and provide sufficient strength to prevent collapse in fire conditions. These measures are known as the heat transmission endpoint and the structural endpoint. The methods in Chapter 722 consider heat transmission endpoint by requiring sufficient mass (thickness) to prevent heat transmission to the opposite side of the element, but the structural endpoint is not considered in the minimum cover tables. This proposal would provide a pointer to the designer to address the structural requirements.
In response to the committee's opinion that the proposal should be located in a structural section, the provisions and procedures in ICC Section 722 including Tables 722.2.3(1) and 722.2.3(2) can be used to establish the fire resistance rating of materials and assemblies by calculation in lieu of the prescriptive requirements of ICC Section 721. Although structural

requirements are usually found in the material chapters, the structural requirements for fire rated construction are not addressed in any other section of the ICC.

In response to the committee's opinion that this proposal requires additional analysis that will increase construction costs, the proposal does not require any additional analysis above what is already required by ICC Section 722.1. ICC Section 722.1 permits the calculated fire resistance of concrete, concrete masonry and clay masonry in accordance with ACI 216.1/TMS 0216. The provisions and procedures in ICC Section 722 including Tables 722.2.3(1) and 722.2.3(2) can be used to establish the fire resistance rating of materials and assemblies by calculation in lieu of the prescriptive requirements of ICC Section 721.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
The proposed code change is for clarification only. The proposal does not require any additional analysis.

FS78-18

FS81-18

IBC: 722.7, 722.7.1, Table TABLE 722.7.1(1), Table TABLE 722.7.1(2), 722.7.2, 722.7.2.1, 722.7.2.2

Proposed Change as Submitted

Proponent: Stephen DiGiovanni, representing ICC Ad Hoc Committee on Tall Wood Buildings (TWB) (TWB@iccsafe.org)

THIS CODE CHANGE WILL BE HEARD BY THE IBC GENERAL COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THIS COMMITTEE.

2018 International Building Code

Add new text as follows

722.7 Fire resistance rating of mass timber. The required fire resistance of mass timber elements in Section 602.4 shall be determined in accordance with Section 703.2 or Section 703.3. The fire resistance rating of building elements shall be as required in Tables 601 and 602 and as specified elsewhere in this code. The fire resistance rating of the mass timber elements shall consist of the fire resistance of the unprotected element added to the protection time of the noncombustible protection.

722.7.1 Minimum required protection. Where required by Sections 602.4.1 through 602.4.3, noncombustible protection shall be provided for mass timber building elements in accordance with Table 722.7.1(1). The rating, in minutes, contributed by the noncombustible protection of mass timber building elements, components, or assemblies, shall be established in accordance with Section 703.8. The protection contributions indicated in Table 722.7.1(2) shall be deemed to comply with this requirement when installed and fastened in accordance with Section 722.7.2.

TABLE 722.7.1(1)
PROTECTION REQUIRED FROM NONCOMBUSTIBLE COVERING MATERIAL

Required Fire Resistance Rating of Building Element per Tables 601 and 602 (hours)	Minimum Protection Required from Noncombustible Protection (minutes)
1	40
2	80
3 or more	120

TABLE 722.7.1(2)
PROTECTION PROVIDED BY NONCOMBUSTIBLE COVERING MATERIAL

Noncombustible Protection	Protection Contribution (minutes)
$^1/_2$ inch Type X Gypsum Board	30
$^5/_8$ inch Type X Gypsum Board	40

722.7.2 Installation of gypsum board noncombustible protection. Gypsum board complying with Table 722.7.1(2) shall be installed in accordance with this section.

722.7.2.1 Interior surfaces. Layers of Type X gypsum board serving as noncombustible protection for interior surfaces of wall and ceiling assemblies determined in accordance with Table 722.7.1(1) shall be installed in accordance with the following:

1. Each layer shall be attached with Type S drywall screws of sufficient length to penetrate the mass timber at least 1 inch when driven flush with the paper surface of the gypsum board.

Exception: The third layer, where determined necessary by Section 722.7, shall be permitted to be attached with1 inch #6 Type S drywall screws to furring channels in accordance with ASTM C645.

2. Screws for attaching the base layer shall be 12 inches on center in both directions.
3. Screws for each layer after the base layer shall be 12 inches on center in both directions and offset from the screws of the previous layers by 4 inches in both directions.
4. All panel edges of any layer shall be offset 18 inches from those of the previous layer.
5. All panel edges shall be attached with screws sized and offset as in items 1 through 4 above and placed at least 1 inch but not more than 2 inches from the panel edge.
6. All panels installed at wall-to-ceiling intersections shall be installed such that ceiling panels are installed first and the wall panels are installed after the ceiling panel has been installed and is fitted tight to the ceiling panel. Where multiple layers are required, each layer shall repeat this process.
7. All panels installed at a wall-to-wall intersection shall be installed such that the panels covering an exterior wall or a wall with a greater fire resistance rating shall be installed first and the panels covering the other wall shall be fitted tight to the panel covering the first wall. Where multiple layers are required, each layer shall repeat this process.
8. Panel edges of the face layer shall be taped and finished with joint compound. Fastener heads shall be covered with joint compound.
9. Panel edges protecting mass timber elements adjacent to unprotected mass timber elements in accordance with Section 602.4.2.2 shall be covered with 1-1/4 inch metal corner bead and finished with joint compound.

722.7.2.2 Exterior surfaces. Layers of Type X gypsum board serving as noncombustible protection for the outside of the exterior heavy timber walls determined in accordance with Table 722.7.1(1) shall be fastened 12 inches on center each way and 6 inches on center at all joints or ends. All panel edges shall be attached with fasteners located at least 1inch but not more than 2 inches from the panel edge. Fasteners shall comply with one of the following:

1. Galvanized nails of minimum 12 Gage with a 7/16 inch head of sufficient length to penetrate the mass timber a minimum of 1 inch.
2. Screws which comply with ASTM C1002 (Type S, Type W, or Type G) of sufficient length to penetrate the mass timber a minimum of 1 inch.

Reason: The Ad Hoc Committee on Tall Wood Buildings (TWB) was created by the ICC Board to explore the science of tall wood buildings and take action on developing code changes for tall wood buildings. The TWB has created several code change proposals with respect to the concept of tall buildings of mass timber and the background information is at the end of this Statement. Within the statement are important links to information, including documents and videos, used in the deliberations which resulted in these proposals.
Typically, mass timber elements will be large due to structural requirements. In addition, CLT panels typically are utilized in odd number laminations. This typically results in excess capacity which means better fire endurance. Thus, mass timber elements are conservative in their fire resistance rating. Furthermore, the TWB decided to provide both a prescriptive path, as embodied in this proposal, and a performance path, embodied in another proposal.

This proposal outlines a method to calculate the fire resistance rating of a protected wood element by adding the fire resistance rating of the unprotected wood member together with the protection time provided by the noncombustible protection applied to the exposed wood.

This proposal should be considered as a companion proposal to the proposals creating new types of mass timber construction in Section 602.4 and the code proposal for Section 703.8 outlining a testing protocol to determine the contribution of noncombustible protection. This code proposal allows the user to select a prescriptive solution utilizing Type X gypsum wall board, which is deemed to comply with the basic requirements of this section and those of the proposed Section 602.4. Since this is a prescriptive solution, conditions of use such as attachment, finishing and edge treatment when bordering exposed mass timber areas, are also included in this section.

A proposal in Section 703.8 both forms the performance path for this determination and is the basis by which the contribution of the *Noncombustible Protection* to the fire resistance rating is determined. Testing of beams, columns, walls and ceiling panels has been used to establish the values found in table 722.7.1(b) for 1/2-inch Type X and 5/8-inch Type X gypsum board as well. Recent testing by AWC confirms the values derived from historic testing. A report is available at the following link: http://bit.ly/WFC-firetestofGWBonCLT . This link was confirmed active on 12/27/17.

Tests proposed in Section 703.8 may be used in the future to justify additional materials added to this table and should not be confused with “membrane protection” which is based on temperature rise on the unexposed side of a membrane attached to construction elements. Noncombustible construction is, instead, noncombustible material meeting the requirements of Section 703.5. Its contribution to the fire resistance rating of any building element is determined by this proposed new section. Simply put, it is determined by measuring the fire resistance time in minutes to the point of structural failure of a mass timber building element and then conducting a second test measuring the fire resistance time in minutes taken to the same point of structural failure. Each test is to be conducted with identical mass timber element

with identical load, construction and condition, but with the proposed noncombustible protection applied to the second assembly. The difference in time between the two samples is the contribution, in minutes, of the noncombustible protection.

Background information: The ICC Board approved the establishment of an ad hoc committee for tall wood buildings in December of 2015. The purpose of the ad hoc committee is to explore the science of tall wood buildings and to investigate the feasibility and take action on developing code changes for tall wood buildings. The committee is comprised of a balance of stakeholders with additional opportunities for interested parties to participate in the four Work Groups established by the ad hoc committee, namely: Code; Fire; Standards/Definitions; and Structural. For more information, be sure to visit the ICC website https://www.iccsafe.org/codes-tech-support/cs/icc-ad-hoc-committee-on-tall-wood-buildings/ (link active and up to date as of 12/27/17). As seen in the "Meeting Minutes and Documents" and "Resource Documents" sections of the committee web page, the ad hoc committee reviewed a substantial amount of information in order to provide technical justification for code proposals.

The ad hoc committee developed proposals for the followings code sections. The committee believes this package of code changes will result in regulations that adequately address the fire and life safety issues of tall mass timber buildings.

IBC Code Section	Description
403.3.2	Water supply requirements for fire pumps in high rise buildings of Type IVA and IVB construction.
504.3	Allowable building height (feet) for buildings of Type IVA, IVB and IVC construction. No changes to Type IV HT construction.
504.4	Allowable building height (stories) for buildings of Type IVA, IVB and IVC construction. No changes to Type IV HT.
506.2	Allowable building area for buildings of Type IVA, IVB and IVC construction. No changes to Type IV HT.
508.4.4.1 509.4.1.1 (new)	Requirements for mass timber building elements serving as fire barriers or horizontal assemblies in buildings of Type IVB of IVC construction.
602.4	Type of Construction requirements for new proposed types of construction: Types IVA, IVB and IVC. No changes to Type IV HT construction. Includes definitions for new terms: Mass timber and Noncombustible protection (mass timber). **THIS IS THE KEY CODE CHANGE PROPOSAL WHICH OUTLINES THE CONSTRUCTION REQUIREMENTS FOR THE PROPOSED NEW TYPE OF MASS TIMBER BUILDINGS. THE PROPOSAL ALSO ADDRESSES CONCEALED SPACES, ADHESIVE PERFORMANCE AND EXTERIOR WALL PROTECTION.**
703.8 (new)	The performance method to determine the increase to the fire resistance rating provided by noncombustible protection applied to the mass timber building element.
703.9 (new)	Requirements for sealants and adhesives to be placed at abutting edges and intersections of mass timber building elements. The reason statement references a Group B proposal to Chapter 17 for special inspection requirements of sealants and adhesives.
718.2.1	Requirements on the use of mass timber building elements used for Fireblocking.
722.7 (new)	Requirements for the fire resistance rating of mass timber elements, including minimum required protection and gypsum board attachment requirements.
3102	Requirements for membrane structures using Type IV HT construction.
3314.7 (new)	New special precautions during construction of buildings of Types IVA, IVB and IVC construction: Standpipes; Water supply for fire department connections; Noncombustible protection required for mass timber elements as construction height increases.
Appendix	Requirements for walls, floors and roofs of Type IV HT construction in buildings located in Fire Districts.
IFC Code Section	**Description**
701.6	Requirements which stipulate the owner's responsibility to maintain inventory of all required fire resistance rated construction in buildings of Types IVA and IVB construction. This includes an annual inspection and proper repair where necessary.
Proposed changes to be submitted in 2019 Group B	
IBC Chapter 17	Required special inspections of mass timber construction • Structural • Sealants and adhesives (see IBC 703.8)
IBC Chapter 23	An update to referenced standard APA PRG 320 Standard for Performance –rated Cross-laminated Timber which is currently undergoing revision to ensure the adequacy of the adhesives under fire conditions.

In addition, fire tests designed to simulate the three new construction types (Types IVA, IVB and IVC) in the ad hoc committee proposals were conducted at the Alcohol Tobacco and Firearms test lab facility. The TWB was involved in the design of the tests, and many members witnessed the test in person or online. The results of the series of 5 fire tests provide additional support for these proposals, and validate the fire performance for each of the types of construction proposed by the committee. The fire tests consisted of one-bedroom apartments on two levels, with both apartments having a corridor leading to a stair. The purpose of the tests was to address the contribution of mass timber to a fire, the performance of connections, the performance of through-penetration fire stops, and to evaluate conditions for responding fire personnel.

To review a summary of the fire tests, please visit:

http://bit.ly/ATF-firetestreport

To watch summary videos of the fire tests, which are accelerated to run in 3 ½ minutes, please visit:

http://bit.ly/ATF-firetestvideos

Both of these links were confirmed active on 12/27/17.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This section provides information that was not previously set forth in the code, and does not change the requirements of current code, thus there is no cost impact when compared with present requirements.

Analysis: The referenced standards, ASTM C645 and ASTM C1002, are currently referenced in 2018 I-codes.

FS81-18

Public Hearing Results

Committee Action: As Modified

Committee Modification: In the column of TABLE 722.7.1(2) that addresses 1/2 inch Type X Gypsum Board, change the protection contribution value (in minutes) to 25 instead of 30.

Committee Reason: The modification coordinates well with the existing language in the code. The committee recommends approval based upon the proponent's reason statement. (Vote: 14-0)

Assembly Action: None

FS81-18

Individual Consideration Agenda

Public Comment 1:

Proponent: Michael Kerner, ClarkDietrichB Buildings Systems, representing ClarkDietrich Building Systemsrequests Disapprove.

Commenter's Reason: There are incorrect references to the types of screws to be used as well as a an incorrect specification reference.
Paragraph 7.22.7.2.1, Item 1: Delete type S screws. These are not the type of screw for attaching gypsum board to wood members.

Under the "Exemption" the wrong ASTM specification is referenced. ASTM C645 should be deleted. This is a product specification, not an installation specification.

Paragraph 722.7.2.2, Item 2: Delete any reference to Type S and Type G screws. These are not the appropriate screws for attaching gypsum board to wood member. Type S screws are for attachment to cold-formed steel framing members and Type G screws are for attaching gypsum board to gypsum board.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
There is no cost impact to disapproving the original proposal. See the cost impact statement contained in the proposal.

Public Comment 2:

Proponent: Adam Shoemaker, representing ClarkDietrich (adam.shoemaker@clarkdietrich.com)requests Disapprove.

Commenter's Reason: Proposed section 722.7.2.1 references the wrong type of screw for this application per ASTM standards, and C645 is not the correct reference for furring channel installation.
Proposed section 722.7.2.2 references the wrong type of screw for this application per ASTM standards.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
No cost impact.

Public Comment 3:

Proponent: Dan Nichols, representing ICC Code Correlation Committee (ccc@iccsafe.org).

Commenter's Reason: The Code Correlation Committee (CCC) is not taking a position on this code change. The CCC submitted this public comment in order to bring a correlation issue to the attention of the full voting membership for the Public Comment Hearings and the Online Governmental Consensus Vote to allow the voting membership to coordinate actions on a package of code changes submitted dealing with tall wood buildings of mass timber construction. This package includes the parent proposal G108-18; if disapproved, the related proposals G28-18, G75-18, G80-18, G84-18, G89-18, FS5-18, FS6-18, FS73-18, FS81-18 and F266-18, will not be correlated with any existing code text if they are approved.
The Code Correlation Committee is a standing committee of the International Code Council whose objectives, procedures and organization are set forth in Council Policy CP#44-13. The objective of the Code Correlation Committee is to maintain technical and editorial consistency among the International Codes and to assist staff in the evaluation and processing of code change proposals and comments that are exclusively editorial.

FS82-18

IBC: 803.9, IFC 803.9

Proposed Change as Submitted

Proponent: Marcelo Hirschler, GBH International, representing GBH International (gbhint@aol.com)

2018 International Building Code

Revise as follows

803.9 ~~High-density polyethylene (HDPE) and polypropylene (PP).~~Solid thermoplastics.. Where solid thermoplastics that melt and drip when exposed to flame, including but not limited to, polypropylene (PP), high-density polyethylene ~~or polypropylene is~~ (HDPE), solid polycarbonate, solid polystyrene, and solid acryclic materials, are used as an *interior finish*, ~~it~~ they shall comply with Section 803.1.1.

2018 International Fire Code

~~[BF]~~ 803.9 ~~High-density polyethylene (HDPE) and polypropylene (PP).~~Solid thermoplastics.. Where solid thermoplastics that melt and drip when exposed to flame, including but not limited to, polypropylene (PP), high-density polyethylene ~~or polypropylene is~~ (HDPE), solid polycarbonate, solid polystyrene, and solid acrylic materials, are used as an interior finish, ~~it~~ they shall comply with Section 803.1.1.

Reason: The same reason that HDPE and PP are not permitted to be used as interior finish simply based on testing to ASTM E84 also applies to some solid thermoplastics that melt and drip when exposed to flame. For proper fire safety they should be tested to NFPA 286.
Note that this applies purely to interior finish and that it does not cover foam plastics, which are already required to be tested to NFPA 286 if used as interior finish.

Cost Impact: The code change proposal will increase the cost of construction
This will require more materials to be tested in accordance with a more rigorous (and more reliable) but more costly fire test.

FS82-18

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The committee determined there was no data presented to indicate there was a problem, the committee was unclear what the proposal applied to, and they had concerns for potential unintended consequences. (Vote 14-0).

Assembly Action: **None**

FS82-18

Individual Consideration Agenda

Public Comment 1:

Proponent: Marcelo Hirschler, representing GBH International (mmh@gbhint.com)requests As Modified by This Public Comment.

Replace as follows:

2018 International Building Code

803.9 High-density polyethylene (HDPE) and polypropylene (PP). Where high-density polyethylene or polypropylene is used as an *interior finish*, it shall comply with Section 803.1.1.

803.10 Thermoplastics other than foam plastics Where a thermoplastic material, other than a foam plastic, is used as an interior finish, it shall comply with Section 803.1.1.

> **Exception:** Where a thermoplastic material, other than a foam plastic, is tested in accordance with ASTM E84 or UL 723 and the test report states that all portions of the test specimen ahead of the flame front remained in position during the test.

2018 International Fire Code

[BF] 803.9 High-density polyethylene (HDPE) and polypropylene (PP). Where high-density polyethylene or polypropylene is used as an interior finish, it shall comply with Section 803.1.1.

[BF] 803.10 Thermoplastics other than foam plastics Where a thermoplastic material, other than a foam plastic, is used as an interior finish, it shall comply with Section 803.1.1.

> **Exception:** Where a thermoplastic material, other than a foam plastic, is tested in accordance with ASTM E84 or UL 723 and the test report states that all portions of the test specimen ahead of the flame front remained in position during the test.

Commenter's Reason: This public comment addresses the concerns expressed by the committee and commenters. The following has been changed: instead of talking about "solid" thermoplastics it talks about thermoplastics that are not foam plastics. It also replaces the terms "melt and drip" by the actual performance during the fire test, using language similar to that used elsewhere in the code, such as in sections on polypropylene siding and plastic composites.
In ASTM E84 (Steiner tunnel) the material is exposed to a flame from below the test specimen. It is well known that some rigid thermoplastics (also known in the plastics industry as solid thermoplastics, as opposed to foamed thermoplastics) will melt when exposed to a flame from below. The result may be (if the test specimen melts and falls to the floor before the flame front reaches it) misleading because the test specimen is not actually exposed. The code recognizes that this behavior is typical of PP and HDPE, which is why the section requires that they be tested to NFPA 286 and not to ASTM E84 when used as interior finish. Therefore, the code change proposal (with the modifications) is intended to treat other rigid (not foamed) thermoplastics the same way as PP and HDPE. This code proposal does not affect foam plastics, which are properly covered by chapter 26.

Instead of placing the item in the same section a new section is proposed to be created. This proposal does not replace any code section but adds a new code section, both to the IBC and to the IFC.

Cost Impact: The net effect of the public comment and code change proposal will increase the cost of construction

This code proposal will require some plastic materials to be tested to a more expensive fire test (NFPA 286 instead of ASTM E84) because the test results from using ASTM E84 for those materials are inappropriate.

FS82-18

FS83-18

IBC: 803.9 (IFC [BF] 803.9)

Proposed Change as Submitted

Proponent: Julius Ballanco, JB Engineering and Code Consulting, P.C., representing Bradley Corporation (JBENGINEER@aol.com)

2018 International Building Code

Revise as follows

803.9 High-density polyethylene (HDPE) and polypropylene (PP). Where high-density polyethylene or polypropylene is used as an *interior finish*, it shall comply with Section 803.1.1. Where high-density polyethylene toilet and urinal partitions are used, they shall comply with Section 1209 and the interior finish requirements of Section 803.1.1 or 803.1.2.

Reason: This proposal adds a requirement indicating that toilet and urinal partitions made of HDPE or PP are not regulated by this section. The interior finish requirements for toiler and urinal partitions would still apply, however, the Class of material in Table 803.3 would be the applicable requirements.
The interior finish requirements are concerned with the fire aspects of a building component. However, there is no history of a fire concern with HDPE water closet and urinal. A study was completed by NFPA Research entitled, "Non-Residential Structure Fires That Originated in Lavatories, Locker Rooms or Coat Check Rooms," dated November 2017, authored by Marty Ahrens. The report shows no fire issue with water closet or urinal partitions. There are no fire deaths reported from fires originating in a commercial toilet room. The results are not surprising.

HDPE partition manufacturers have a framing system that protects the edges of the HDPE material. As a result, the HDPE partitions cannot readily ignite. The typical cause of a fire origin in a toilet room is the waste basket or electrical appliance. There is no fire ignition source in the vicinity of a water closet or urinal partition.

What must be understood is that while fire-retardant chemicals can be added to HDPE used for water closet and urinal partitions, however, the chemicals change the exterior surface requirements of the partitions. The fire-retardant chemicals make the surface more porous. It also makes the surface less scratch resistant. As a result, the partitions would no longer have the same cleanliness and sanitation aspect required for a water closet or urinal partition. This would in effect eliminate the acceptance of HDPE partitions.

The NFPA study clearly establishes that a fire hazard with HDPE water closet or urinal partitions does not exist. It is more important to emphasize the sanitary and health issues as identified in Section 1209.

Cost Impact: The code change proposal will decrease the cost of construction
The change will remove an unnecessary requirement for water closet and urinal partitions.

FS83-18

Public Hearing Results

Errata: Section numbers shown to indicate the coordinating section in the IFC that will change.

Committee Action: Disapproved

Committee Reason: The committee did not find adequate fire issues associated with bathrooms to warrant the proposed requirements, and desired consistency with the G-7 decision, which was disapproval of a proposal to eliminate toilet room privacy partitions from the definition of Interior Wall and Ceiling Finish. (Vote 14-0)

Assembly Action: None

FS83-18

Individual Consideration Agenda

Public Comment 1:

Proponent: Julius Ballanco, JB Engineering and Code Consulting, P.C., representing American Society of Plumbing Engineers - Sr. Director of Technical and Regulatory Affairs (jbengineer@aol.com); Andrew Klein, representing Building Owners and Managers Association International (andrew@asklein.com); Matt Sigler, Plumbing Manufacturers International, representing Plumbing Manufacturers International (msigler@safeplumbing.org); Ramiro Mata, representing American Society of Plumbing Engineers - Sr. Director of Technical and Regulatory Affairs (rmata@aspe.org)requests As Submitted.

Commenter's Reason: This change will allow toilet and urinal partitions to be evaluated in accordance with ASTM E84 or UL 723, as well as, NFPA 286. The current requirement only allow testing in accordance with NFPA 286. NFPA 286 is not an appropriate test for determining the viability of plastic toilet and urinal partitions. NFPA 286, often referred to as the room corner fire test, is a standard for fire testing of interior wall finish material and/or ceiling finish material to determine equivalency to a Class A material.
The intent of the standard is to evaluate the flammability characteristics of wall and ceiling finish material. The room size for the fire test is 8 feet wide by 12 feet long by 8 feet high. In order to perform this evaluation, wall finish material being tested is applied to the entire wall surface of three walls. The fire source for the test is a 12 inch by 12 inch by 6 inch high burner that is located in the corner against the two walls. The heat output of the burner is 40 kW (136,485 Btu/hr) for the first 5 minutes and 160 kW (549,942 Btu/hr) for the next 10 minutes. The burner is designed to have the flame reach the ceiling during the last 10 minutes of the test.

When testing interior wall finish material, the total amount of wall area covered by the material is 256 square feet. A toilet or urinal partition is not applied to a wall as an interior finish material. Furthermore, toilet and urinal partitions do not account for 256 square feet of surface area in a toilet room that is 8 feet by 12 feet in area. Toilet partitions are not even installed against a wall, they are installed out from a wall to provide a privacy barrier around a water closet. The wall serves as the privacy barrier for a corner or rear section of a water closet compartment. In a room 8 feet by 12 feet, only one water closet compartment would typically be installed based on ADA dimensional requirements. If a second water closet compartment was installed, there would not be adequate space, based on the Plumbing Code requirements, for the two lavatories that would also be required.

An ADA compartment would measure 56 inches by 60 inches. Partitions are 56 inches in height, typically installed 12 inches from the finished floor. The total square footage of the toilet partition would be 45 square feet; NOT 256 square feet of material.

The fire test required by NFPA 286 would require 5.7 times the surface area or material volume to be tested compared to what could possibly be installed in the test size room. Increasing the volume of material is a simple means of causing a failure during a fire test by adding an unrealistic fuel load. A more appropriate fire test would be of the anticipated volume of the material, as well as, anticipating the fire source.

Another fallacy of applying NFPA 286 to toilet partitions is the burner requirements during the test. The burner must provide a heat output of 40 kW or 136,485 Btu/hr for the first five minutes. For the remaining 10 minutes, the heat output must be 160 kW or 549,942 Btu/hr. This heat output requires an extensive fuel load to generate the equivalent heat release in an actual fire in a commercial toilet room.

Toilet partitions are only located in commercial toilet rooms or bathrooms. There is no fuel load of any significance in a commercial toilet room. There is no fuel source under a toilet partition, whereas the burner is applied directly to the toilet partition in the NFPA 286 test. Within the confines of a toilet partition is a water closet. The water closet is made of

vitreous china and filled with water. There is no fuel source. If a flush valve is connected to the water closet, the flush valve is made of brass, which is not a fuel source. The floors in commercial toilet rooms are ceramic tile, which do not burn.

The only fuel load associated with a commercial toilet room is typically a trash container and paper dispenser. However, both are located a distance away from a toilet partition. Other possible fuel loads in a commercial toilet room could be a baby changing station, which is made of the same material as a toilet partition but is not required to comply with NFPA 286. A plastic shower enclosure is another fuel load, which also is not required to comply with NFPA 286.

Hence, there is no fuel load in a commercial toilet room that can generate a heat release of 160 kW or 549,942 Btu/hr near a plastic toilet partition.

When a new fire test is added to the Building Code, a full analysis should be performed to determine its applicability. No such analysis was performed on plastic toilet partitions. If a proper fire analysis was performed, it would clearly show that NFPA 286 should not apply to toilet or urinal partitions. There is no fire concern with plastic toilet and urinal partitions.

Plastic toilet and urinal partitions have been installed for more than 25 years. NFPA Research, Data and Analytics Division prepared a report entitled, “Non-Residential Structure Fires That Originated in Lavatories, Locker Rooms or Coat Check Rooms,” dated November 2017. Not one fire death was reported involving a plastic toilet or urinal partition. This is not surprising since there is no recorded fire problem associated with plastic toilet partitions.

The more important requirements for toilet and urinal partitions relate to sanitation and performance. Plastic toilet and urinal partitions do not facilitate the growth of bacteria. This is important in a toilet room environment to maintain proper sanitation. They are also readily cleanable.

Plastic toilet partitions are low maintenance and moisture resistant, even in extreme wet or humid environments. Plastic toilet and urinal partitions are fabricated from high density polyethylene (HDPE). Many manufacturers use an advanced formula of at least 30% pre-consumer recycled HDPE in their partitions.

From a performance standpoint there is a concern with toilet room partitions being subjected to vandalism, graffiti, and scratching. Plastic partitions are hard to scratch. This is verified by testing to ASTM D2197. Graffiti is easily removed. This is verified by testing to ASTM D6578. They are also hard to dent, which is verified by testing to ASTM D2794.

Based on performance and the lack of a fire problem, plastic toilet and urinal partitions should be permitted to be tested in accordance with ASTM E84 or UL 723 as a Class C interior finish material, not mandated to be a Class A material tested to NFPA 286.

Cost Impact: The net effect of the public comment and code change proposal will decrease the cost of construction This will lower the cost of construction by allowing Class C HDPE toilet and urinal partitions. There is no justification for prohibiting these partitions that have been successfully installed and used for more than 25 years.

FS83-18

FS85-18

IBC: Table TABLE 803.13

Proposed Change as Submitted

Proponent: Gregory Nicholls, representing The American Institute of Architects (gnicholls@preview-group.com)

2018 International Building Code

Revise as follows

TABLE 803.13
INTERIOR WALL AND CEILING FINISH REQUIREMENTS BY OCCUPANCYk

GROUP	SPRINKLERED[l]			NONSPRINKLERED		
	Interior exit stairways and ramps and exit passageways[a, b]	**Enclosures for fire-resistive rated corridors, and enclosure for surfaces adjacent to exit access stairways and ramps, and unenclosed exit discharge elements [a,n]**	**Rooms and enclosed spaces[c]**	**Interior exit stairways and ramps and exit passageways[a, b]**	**Enclosures for fire-resistive rated corridors, and enclosure for surfaces adjacent to exit access stairways and ramps, and enclosed portions of exit discharge elements [a,n]**	**Rooms and enclosed spaces[c]**
A-1 & A-2	B	B	C	A	A[d]	B[e]
A-3[f], A-4, A-5	B	B	C	A	A[d]	C
B, E, M, R-1	B	C[m]	C	A	B	C
R-4	B	C	C	A	B	B
F	C	C	C	B	C	C
H	B	B	C[g]	A	A	B
I-1	B	C	C	A	B	B
I-2	B	B	B[h, i]	A	A	B
I-3	A	A[j]	C	A	A	B
I-4	B	B	B[h, i]	A	A	B
R-2	C	C	C	B	B	C
R-3	C	C	C	C	C	C
S	C	C	C	B	B	C
U	No restrictions			No restrictions		

For SI: 1 inch = 25.4 mm, 1 square foot = 0.0929 m^2.

a. Class C interior finish materials shall be permitted 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 803.15.1.

b. In other than Group I-3 occupancies in buildings less than three stories above grade plane, Class B interior finish for nonsprinklered buildings and Class C interior finish for sprinklered buildings shall be permitted in interior exit stairways and ramps.
c. Requirements for rooms and enclosed spaces shall be based on 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 to be enclosing spaces and the rooms or spaces on both sides shall be considered to be one room or space. 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 be not 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 wainscotting extending not more than 48 inches above the finished floor in corridors and exit access stairways and ramps.
k. Finish materials as provided for in other sections of this code.
l. Applies when protected by an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2.
m. Corridors in ambulatory care facilities shall be provided with Class A or B materials.
<u>n. Unenclosed exit discharge elements include those providing the fire-resistive rated floors below</u>

Reason: The current table does not clearly or adequately address what should be done with exit discharge elements allowed by Section 1028.1 exception 1. The reference to "lobbies" appears to be an antiquated reference to the older versions of the legacy codes that used that term in the exit discharge description. But the problem is that the intermediate space (such as a lobby or vestibule) allowed by the exception does not have to be enclosed when certain conditions are met, and is not an interior exit stairway, ramp or passageway.
This proposal seeks to revise the table to provide clear direction on where these exit discharge elements belong, and provide those spaces with requirements less restrictive than enclosed exit elements but more restrictive than typical spaces. Experience seeing numerous office and hotel lobbies used as an exit discharge element would lead us to believe that this table has not been applied to the finishes in exit discharge spaces, so this change also attempts to remain in focus to actual construction.

With these areas such as corridors, exit access elements and discharges which are often open to the rest of the floor, where does the authority of this table stop and start? For corridors that are not required to be rated, what difference is there between the spaces they can and often are open to and the corridor itself? So the proposal delineates fire-resistive corridors from others that can be treated as rooms and spaces. For the unenclosed exit access stairs and ramps and the unenclosed exit discharge elements, the new text provides some clarity that the limits of the finish ratings would only apply to the walls and ceilings by the ramps, stairs, vestibules and lobby/exit discharge path. The addition of footnote n provides for the rated floor below these elements required by the conditions in the exception to Section 1028.1.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
THe current code is not clear on what is required for finishes in exit discharge elements, so there is no comparative cost.

FS85-18

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The committee determined the current table is understandable and not in need of clarification. Furthermore they concluded corridors should not be split between sprinkled and non-sprinkled as proposed. (Vote 14-0)

Assembly Action: **None**

FS85-18

Individual Consideration Agenda

Public Comment 1:

Proponent: David Collins, representing The American Institute of Architects (dcollins@preview-group.com)requests As Modified by This Public Comment.

Modify as follows:

2018 International Building Code

TABLE 803.13
INTERIOR WALL AND CEILING FINISH REQUIREMENTS BY OCCUPANCYk

GROUP	SPRINKLERED[l]			NONSPRINKLERED		
	Interior exit stairways and ramps and exit passageways[b]	~~Enclosures for fire-resistive rated corridors~~Corridors, and ~~enclosure for surfaces adjacent to exit~~ exit access stairways and ramps, and unenclosed exit discharge elements[a,n]	Rooms and enclosed spaces[c]	Interior exit stairways and ramps and exit passageways[a, b]	~~Enclosures for fire-resistive rated corridors~~Corridors, and ~~enclosure for surfaces adjacent to~~ exit access stairways and ramps, and enclosed portions of exit discharge elements [a,n]	Rooms and enclosed spaces[c]
A-1 ~~&~~ A-2	B	B	C	A	A[d]	B[e]
A-3[f], A-4, A-5	B	B	C	A	A[d]	C
B, E, M, R-1	B	C[m]	C	A	B	C
R-4	B	C	C	A	B	B
F	C	C	C	B	C	C
H	B	B	C[g]	A	A	B
I-1	B	C	C	A	B	B
I-2	B	B	B[h, i]	A	A	B
I-3	A	A[j]	C	A	A	B
I-4	B	B	B[h, i]	A	A	B
R-2	C	C	C	B	B	C
R-3	C	C	C	C	C	C
S	C	C	C	B	B	C
U	No restrictions			No restrictions		

For SI:

1 inch = 25.4 mm, 1 square foot = 0.0929 m^2.

a.Class C interior finish materials shall be permitted 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 803.15.1.

b. In other than Group I-3 occupancies in buildings less than three stories above grade plane, Class B interior finish for nonsprinklered buildings and Class C interior finish for sprinklered buildings shall be permitted in interior exit stairways and ramps.
c. Requirements for rooms and enclosed spaces shall be based on 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 to be enclosing spaces and the rooms or spaces on both sides shall be considered to be one room or space. 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 be not 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 wainscotting extending not more than 48 inches above the finished floor in corridors and exit access stairways and ramps.
k. Finish materials as provided for in other sections of this code.
l. Applies when protected by an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2.
m. Corridors in ambulatory care facilities shall be provided with Class A or B materials.
n. Unenclosed exit discharge elements include those providing the fire-resistive rated floors below

Commenter's Reason: The committee rejected the portion of the proposal to have separate requirements for sprinkled and unsprinkled corridors, so that has been eliminated by this modification.
But, although the committee did indicate the existing table is understandable, they missed the problem of it being incomplete. The current Table 803.13 IBC does not tell the user what is required for unenclosed exit discharge elements, such as the exit discharge options in Section 1028.1, exceptions 1 and 2. Here the code allows exits to discharge to interior spaces without any classification in the current table. These level of exit discharge areas and vestibules are not: Interior exits or passageways, corridors, exit access stairways or ramps. They should not have the lowest level of finish materials, as allowed for typical rooms and enclosed spaces.

This proposed code change provides the appropriate compromise position between exits and rooms, and clarifies the code to prevent both too restrictive or too loose an interpretation of how to regulate finishes in exit discharge areas and vestibules.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
As the code currently is silent on this question, this should make it easier for the user to understand and apply the code.

FS85-18

FS91-18

IBC: 1402.2

Proposed Change as Submitted

Proponent: Theresa Weston, representing Air Barrier Association (theresa.a.weston@dupont.com)

2018 International Building Code

Revise as follows

1402.2 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 1404.4. 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 1403.2, 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 Section 1404.3 <u>and Section C402.5 of the International Energy Conservation Code.</u>

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 1403.2 and 1404.4, 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 E331 under the following conditions:

   2.1. *Exterior wall envelope* test assemblies shall include not fewer than one opening, one control joint, one wall/eave interface and one wall sill. Tested openings and penetrations shall be representative of the intended end-use configuration.
   2.2. *Exterior wall envelope* test assemblies shall be not less than 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/m^2).
   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.
3. *Exterior insulation and finish systems* (EIFS) complying with Section 1407.4.1.

Reason: Air leakage control is currently dealt with in the I-codes based on energy efficiency considerations, but it is also critical to protection against moisture condensation. Air leakage can move 100x more moisture than vapor diffusion, and vapor retarders will not work properly without air leakage control. As stated in the Whole Building Design Guide:
"Moisture contributed by air leakage is a significant source and should be a serious concern in the design of the wall system. In fact, the design of the building envelope for minimizing air leakage is more critical than the design of the vapor barrier.

To illustrate this point, consider that the amount of moisture contributed to a building by the air that flows through a crack 1/16th inch thick by 1 foot long is just over 5 pints per day in a light breeze. In contrast, the amount of moisture contributed by vapor diffusion through a 10 foot by 50-foot painted block wall over the same period equals just under 1/3 of a pint (about 5 ounces)."

It is important to include air leakage control in Section 1402.2 as it will highlight its importance to moisture management and facilitate the inclusion of air leakage control in water management details.

Cost Impact: The code change proposal will increase the cost of construction
For jurisdictions that adopt both the IBC and IECC, there will be no cost impact as this proposed provision is already in existing code provisions. For jurisdictions that do not adopt the IECC, there will be increased cost of incorporating air barriers into the construction, but that cost will be offset by reducing air infiltration related condensation moisture issues and associated liability.

FS91-18

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The committee determined the proposed requirements needs to be in the IBC, not provided as a reference to the IECC, and a limitation to the prescriptive approach was not desirable. (Vote 10-4).

Assembly Action: **None**

FS91-18

Individual Consideration Agenda

Public Comment 1:

Proponent: Theresa Weston, representing Air Barrier Association (theresa.a.weston@dupont.com)requests As Modified by This Public Comment.

Replace as follows:

2018 International Building Code

1404.3 Vapor retarders. Vapor retarders as described in Section 1404.3.3 shall be provided in accordance with Sections 1404.3.1 and 1404.3.2, or an approved design using accepted engineering practice for hygrothermal analysis. Vapor retarders shall be installed in accordance with 1404.3.3

1404.3.3 Installation Vapor retarders shall be installed in accordance with the manufacturer s instructions or an approved design. Where a vapor retarder also functions as an air barrier, the vapor retarder shall be installed as a continuous air barrier in accordance with the International Energy Conservation Code.

Commenter's Reason: The committee appeared to agree with the concept that vapor retarders needed to be installed as or in conjunction with an air barrier, but was uncomfortable with a specific reference to the IECC sections. This public comment clarifies and focuses the original intent of the proposal to be specific the vapor barrier installation and only references the IECC so that a conflict will not occur between the IBC and the IECC.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This should not cause any cost increase, as it does not add new requirements. Rather it clarifies the installation of already required components.

FS91-18

FS93-18

IBC: 202 (New), 1402.2, 1404.5 (New), 1404.5.1 (New), 1404.5.2 (New), Chapter 35

Proposed Change as Submitted

Proponent: Jay Crandell, P.E., ARES Consulting, representing Foam Sheathing Committee of the American Chemistry Council (jcrandell@aresconsulting.biz)

2018 International Building Code

Add new definition as follows

WIND-DRIVEN RAIN INDEX. A representation of the combined climate effects of wind and rain which affect the magnitude and frequency of rain deposition on building exterior surfaces.

Revise as follows

1402.2 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 1404.4. 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 1403.2, 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 Section 1404.3. Where required by Section 1404.5, additional provisions for weather protection shall be provided.

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 1403.2 and 1404.4, 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 E331 under the following conditions:

   2.1. *Exterior wall envelope* test assemblies shall include not fewer than one opening, one control joint, one wall/eave interface and one wall sill. Tested openings and penetrations shall be representative of the intended end-use configuration.
   2.2. *Exterior wall envelope* test assemblies shall be not less than 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/m^2).
   2.4. *Exterior wall envelope* assemblies shall be subjected to a minimum test exposure duration of 2 hours.

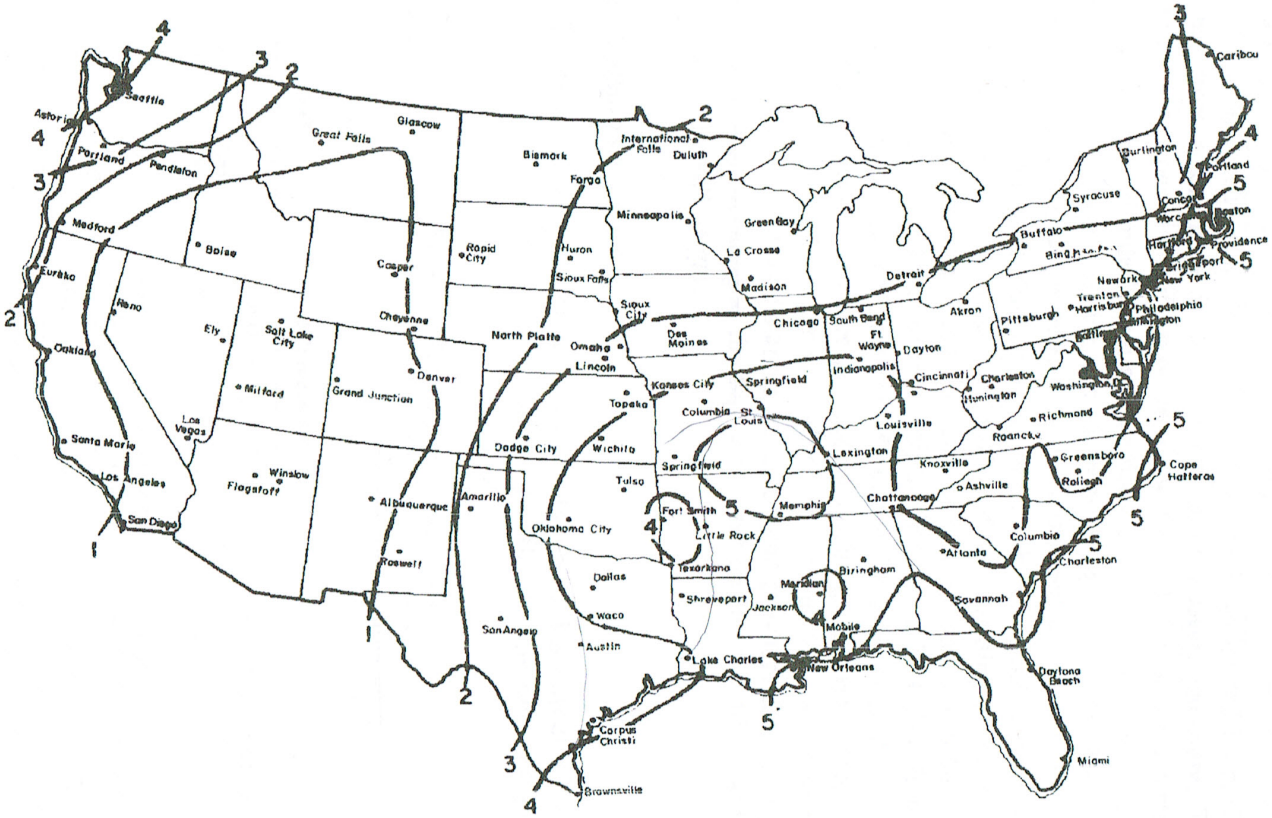
   The *exterior wall envelope* design shall be considered to resist wind-driven rain where the results of testing indicate that water did not penetrate control joints in the *exterior wall envelope*, joints at the perimeter of openings or intersections of terminations with dissimilar materials.
3. *Exterior insulation and finish systems* (EIFS) complying with Section 1407.4.1.

Add new text as follows

1404.5 Additional provisions for weather protection. The provisions of Section 1404.5.1 and 1404.5.2 shall apply in the required wind-driven rain index and climate zones and, where not required, shall be permitted.

1404.5.1 Enhanced drainage. Where the wind-driven rain index of Figure 1404.5.1 is 4 or greater, the means of drainage required by Section 1402.2 shall be satisfied by one of the following:

1. A drained air space not less than nominal 3/16-inch deep behind the cladding,
2. An open drainage material, not less than nominal 1/4-inch thick and with a cross-section area that is not less than 80 percent open, installed between the cladding and backing,
3. Hollow-backed metal or vinyl siding installed in accordance with the manufacturer's instructions, or
4. An approved drainage design with drainage performance at least equivalent to Items 1, 2, or 3, or not less than 90 percent drainage efficiency as measured in accordance with ASTM E 2273 or Annex A2 of ASTM E 2925.



Reprinted, with permission, from ASTM STP778 Masonry: Materials, Properties, and Performance, copyright ASTM International, 100 Barr Harbor Drive, West Conshohocken, PA 19428.

1404.5.1
WIND-DRIVEN RAIN INDEX

1404.5.2 Protection against inward vapor drive. Where claddings addressed in Sections 1404.10 and 1404.15 are used in Climate Zones 1A, 2A, or 3A in accordance with Chapter 3 of the International Energy Conservation Code and installed over wood-based or gypsum-based sheathing, a ventilated air space shall be provided in accordance with Exception 2 in Section 2510.6 and drainage shall be provided in accordance with Items 1, 2, or 4 of Section 1404.5.1.

Exceptions:

1. An approved drainage and ventilation design, including vent inlets and outlets, with ventilation performance at least equivalent to Items 1 or 2 of Section 1404.5.1 as measured in accordance with Annex A1 of ASTM E 2925.
2. An air space for ventilation shall not be required where foam plastic insulating sheathing complying with ASTM C 578 or ASTM C 1289 is located between the cladding and the wood-based or gypsum-based sheathing.

Add new standard(s) follows

CHAPTER **35 REFERENCED STANDARDS**

ASTM

ASTM International
100 Barr Harbor Drive, P.O. Box C700
West Conshohocken PA 19428-2959
US

E2925-17:

Standard Specification for Manufactured Polymeric Drainage and Ventilation Materials Used to Provide a Rainscreen Function

Reason: Proposed new Section 1404.5 is needed to provide adequate moisture performance for exterior wall coverings

and vulnerable wall materials in hazardous climate conditions that are prone to cause moisture problems. In these cases, the generic minimum weather protection practices in the code are unreliable and increase the risk of moisture durability problems including material degradation, rot, and mold. This proposal will serve to address this problem and provide risk-consistent solutions in coordination with climate hazards (e.g., wind-driven rain) as they vary across the U.S. In regions of low-to-moderate hazard, this proposal requires no change in practice but permits the enhanced provisions to be used.
First, the existing exceptions in Section 1402.2 are unchanged. Therefore, where these existing exceptions apply, the enhanced requirements of proposed Section 1404.5 would not apply because the charging language for use of Section 1404.5 is located in Section 1402.2.

Second, the provisions of proposed Section 1404.5 are required only in the more extreme climates of the U.S. with regard to moisture effects on exterior walls of buildings. However, the practices employed are beneficial in all climates; therefore, they are permitted to be used in other climate conditions.

Within Section 1404.5, proposed Section 1404.5.1 addresses drainage for exterior wall coverings in climates with significant wind-driven rain hazard. In these climates, the need for enhanced drainage is well understood from experience and research. For example, these provisions are modeled very closely after provisions found in the National Building Code of Canada (Section 9.27) as applied to climates with significant wind-driven rain. The NBC provsions were necessitated by wide-spread water intrusion problems and are based on research, field studies, and expert judgment. In the U.S. similar problems are occurring, particularly with conventional stucco installations on wood frame construction. These provisions will also help mitigate risk of water intrusion damage related to normal imperfections in exterior wall covering installation.

Also within Section 1404.5, proposed Section 1404.5.2 addresses inward vapor drives which present a well-known cause of moisture problems for walls clad with "reservoir claddings" such as adhered veneer (1404.10) and stucco (1404.15). These cladding types absorb water rainwater and then while drying (particularly with impinging energy from the sun) create significant inward vapor drives, forcing water vapor through underlying layer(s), such as the water resistive barrier, and into moisture sensitive materials within the wall assembly (such as wood-based and gypsum-based sheathings). Moisture sensitive materials such as wood-based and gypsum-based sheathings backing stucco and adhered veneers are particularly vulnerable if not adequately protected. Other reservoir claddings, like anchored masonry veneer (i.e., not adhered), already comply with Section 1404.5.2 due to the presence of a nominal 1-inch or greater vented air space behind the veneer.

The proposed provisions of Section 1404.5.2 coordinate with changes made last code cycle for Section 2510.6, exception 2. However, these requirements are broadly applicable and, thus, are best located in Chapter 14 and not hidden in an incomplete exception statement back in Chapter 25. More importantly, Section 1404.5.2 ensures the ventilated air space required in Exception 2 of Section 2510.6 also complies with the drainage requirements of Section 1404.5.1 and this serves to define a minimum size or effectiveness of the ventilated air space. Additionally, the charging language for Section 1404.5 permits these enhanced practices or options to be used in any climate zone, not just those limited conditions addressed in Exception 2 of Section 2510.6.

The exceptions in Section 1404.5.2 provide useful alternative means of addressing inward vapor drives from reservoir claddings. The first exception provides a means to justify use of alternative drainage and ventilation designs. The second exception provides a means to avoid use of a ventilated air space. It works by way of blocking the inward movement of water vapor from the reservoir cladding by use of lower permeneance foam plastic insulating sheathing behind the cladding. This practice has been used successfully to prevent inward vapor drives from reservoir claddings and protect underlying moisture sensitive wall materials. It is also commonly used with 1-coat stucco systems. The drainage requirements of Section 1404.5.1 would still apply where applicable.

The provisions of Section 1404.5 are supported by various sources as documented in the research report ("Moisture Control Guide") referenced in the bibliography. The wind-driven rain map provided as new Figure 1404.5.1 is based on an ASTM paper as noted as the source for the figure. It is also very consistent with a more recent wind-driven rain climatology study by the University of Georgia.

From a resiliency perspective, it is no less appropriate to consider actions to address variation of building durability climate hazards across the U.S. as it is to consider variation in structural hazards such as wind, snow, and earthquake loads as they also vary across the U.S. In fact, durability problems related to climate-driven moisture effects and associated vulnerabilities of construction materials and methods often contribute to damages from structural hazards. Thus, this proposal will help ensure intended structural performance for the service life of a building.

Bibliography: Model Moisture Control Guidelines for Light-Frame Walls: A Building Code Supplement for Builders, Designers, and Code Officials, ABTG Research Report No. 1701-01, 2017, Applied Building Technology Group LLC, https://www.appliedbuildingtech.com/rr/1701-01

Cost Impact: The code change proposal will increase the cost of construction
cdpACCESS does not provide a option to declare "The code change proposal will increase and decrease cost of

construction" (which is perhaps a more appropriate description of the cost impact of this proposal for reasons that follow).

For most of the U.S. these provisions do not apply and there is no cost impact. However, proposed Section 1404.5.1 will increase costs for cladding installation on some types of construction in the more hazardous wind-driven rain climates by requiring provision of adequate drainage behind claddings. However, there is no change or cost impact for claddings that already meet the requirements (e.g., anchored brick veneer) or which are already inherently drained (e.g., vinyl siding). There also is no change or cost impact for walls of concrete or masonry construction per Section 1402.2, Exception 1, or for claddings meeting the existing performance requirement of Section 1402.2, Exception 2 (e.g., barrier EIFS).

Proposed Section 1404.5.2 would appear to increase cost for stucco and adhered veneer installations that are in hot-humid climates and which do not already address inward driven moisture, but the drainage and ventilation requirements are already vaguely required (complete in concept but not in detail) in Exception 2 of Section 2510.6 of the code. Also, Exception 1 of Section 1402.2 prevents any cost impact to installations on concrete or masonry construction. Finally, proposed Section 1404.5.2 includes additional options for compliance (e.g., exceptions) that may actually reduce cost of compliance for some stucco and adhered veneer installations.

Without robust data on the variation in construction types and cladding types by regional climate conditions, it is difficult to determine the magnitude of cost impact and whether or not it is a net increase or decrease in cost for a population of buildings representative of those built using the IBC. But, it is clear in some specific cases there could be a cost increase. In these specific cases, one conventional solution that would satisfy both Sections 1404.5.1 and 1404.5.2 would be to provide furring behind the cladding (and this is not necessarily the low-cost solution). The total cost of furring including overhead and profit per the 2017 RS Means Open Shop Building Construction Costs manual ranges from about $0.60/SF ($1.17/LF 1x3 wood furring pneumatically nailed to wood framing at 24"oc) to $2.22/SF (metal furring at 16"oc). Considering the many cases where there is no cost impact, this proposal will range in cost impact of $0/SF to as much as $2.22/SF depending on a number of factors. It is likely that the net impact is closer to $0/SF than $2.22/SF.

FS93-18

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The proponent requested disapproval after he had tabled the item. He was unable to address the concerns with the proposal in the time frame of the day. (Vote 13-0).

Assembly Action: **None**

FS93-18

Individual Consideration Agenda

Public Comment 1:

Proponent: Jay Crandell, representing Foam Sheathing Committee of the American Chemistry Council (jcrandell@aresconsulting.biz)requests As Modified by This Public Comment.

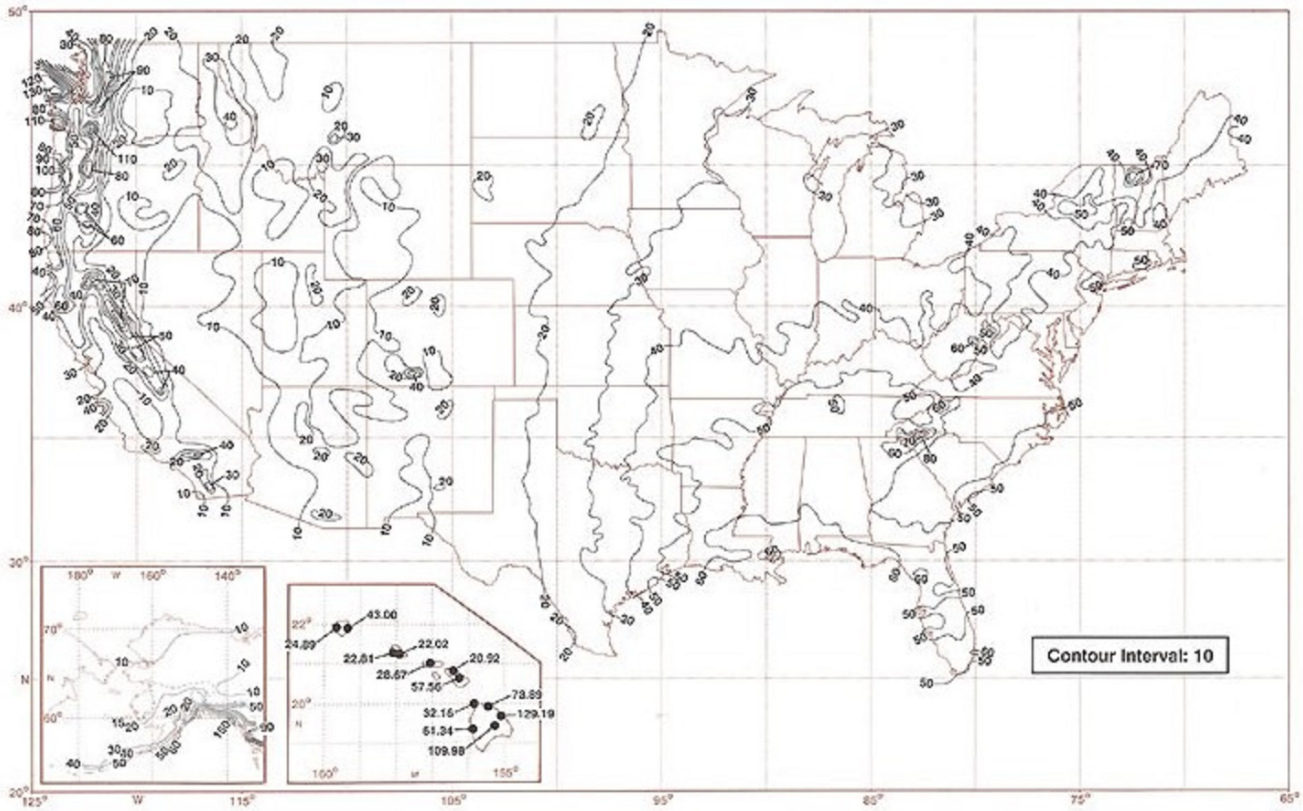
Replace as follows:

2018 International Building Code

1402.2.1 Extreme precipitation regions. Where the average annual precipitation amount is 50 inches (1270 mm) or greater as determined in accordance with Figure 1402.2.1 or local climate data, the means of drainage required by Section 1402.2 shall comply with one of the following:

1. An air space for drainage not less than 3/16-inch (4.7 mm) deep behind the cladding,
2. An *approved* exterior wall covering assembly, cladding, drainage material or design with drainage efficiency of 90 percent or greater as measured in accordance with ASTM E 2273 or Annex A2 of ASTM E 2925.

Exception: An *approved* design based on site-specific conditions including wind-driven rain exposure, building height, and use of overhangs or other methods of protecting walls from water intrusion caused by wind-driven rain.



Source: National Oceanic and Atmospheric Administration, National Climate Data Center, Asheville, NC

1402.2.1

AVERAGE ANNUAL PRECIPITATION AMOUNT (INCHES)

CHAPTER **35 REFERENCED STANDARDS**

ASTM

E2925 - 17: Standard Specification for Manufactured Polymeric Drainage and Ventilation Materials Used to Provide a Rainscreen Function 1402.2.1

Commenter's Reason: This public comment represents an attempt to address constructive feedback from the FS committee and various commenters on the original FS93 proposal, focusing on the wind-driven rain provisions. All those who testified at the committee hearing have been provided opportunity to review and comment as was intended by the proponent's request to disapprove at the first hearing as a result of insufficient time to develop an appropriate modification. This public comment is a result of that outreach, but should not be taken as having achieved complete unanimity.

It is well-known that wind-driven rain is the primary hazard related to water-intrusion in building walls; therefore, it is important to recognize appropriate risk-consistent practices in the code to address areas subject to known and extreme rain exposure, especially on a routine annual basis. Where applicable, this proposal will also help address areas with extreme, but lower-frequency events such as tropical storms and hurricanes. A well-known and commonly employed technique is to use a rainscreen cladding system which this proposal supports in a manner that is broadly inclusive of various materials and methods.

Specifically, this proposal responds to the various comments from the committee and floor testimony as documented by video footage at the committee hearing:

1. Precipitation map: This PC replaces the originally proposed wind-driven rain index map because it did not cover all U.S. states (e.g., AK and HI) and wind-driven rain index data is not readily available. The proposed new U.S. map is an average annual precipitation map produced by NOAA and includes contours showing variation in precipitation at a national scale, including AK and HI. However, on a county-by-county basis, appropriate micro-scale data is best sourced from local climate data because rainfall amounts can vary significantly in some states or even counties. Such local data and state/local maps are readily available. Thus, the proposal allows the proposed national map or local climate data to be used as similarly done for other climatic criteria in the IBC (see several examples from IBC listed below).

2. Criteria Impact: Several commenters also were concerned with the original proposal impacting too large an area of the U.S. This map reduces the extent of areas affected by use of 50 inches of average annual rainfall as the trigger for the enhanced drainage provisions. To relax this criteria any further would begin to remove areas with a known history of

problems that have been or can be resolved with enhanced drainage requirements. Based on a University of Georgia study of wind-driven rain climatology, this rainfall region also aligns reasonably well with regions that routinely experience significant wind-driven rain and, therefore, the 50" annual precipitation criteria reasonably isolates the most extreme wind-driven rainfall locations of the U.S. Finally, localities may adopt or amend this criteria based on local experience as commonly done through the local adoption process. For example, states or counties within hurricane prone regions (that are not otherwise captured by the 50 annual average precipitation region) may consider these enhanced drainage (rainscreen) provisions to help address concern with water intrusion during more extreme (and less routine) wind-driven rain conditions.

3. Compliance Options: There was disagreement on creating a laundry list as originally proposed and, therefore, this PC has shortened the list of compliance options to two simple conditions: (1) provide a minimum drainage space or (2) an assembly with a drainage material or method that meets currently accepted and widely used standardized performance testing requirements for drainage. Many (if not all) existing drainage materials and drainable wraps comply with the cited ASTM test standards and 90% drainage efficiency criteria. Thus, this PC is inclusive and will help support a level playing field and provide market assurances for materials and methods providing enhanced drainage capabilities. The 90% drainage efficiency is also consistent with current requirements in the IBC (Section 1407.4.1) and IRC (Section R703.9.2) for drainable EIFS.

4. An exception is provided to allow the flexibility to use alternative site-specific designed solutions to mitigate wind-driven rain effects. This recognizes that designers may use features such as overhangs to protect walls or portions of walls from wind-driven rain.

5. Specifying a minimum drainage space also will help address one committee member's concern with control of exterior fire propagation by avoiding drainage spaces that are larger than necessary to provide adequate drainage and also provide guidance in configuring wall assemblies (where a drainage space is provided) for NFPA 285 assembly testing to ensure fire performance and drainage needs are coordinated for durability and safety.

6. Finally, the provision is moved to a more appropriate location as a subsection of 1402.2 (rather than being a separate section referenced from Section 1402.2) which simplifies the proposal and code organization.

It should be noted that the approach taken in this proposal and its allowance to use local climatic or hazard conditions is consistent with several other similar applications in the IBC as follows:

[From 1609.3] *In nonhurricane-prone regions, when the basic design wind speed, V, is estimated from regional climatic data, the basic design wind speed, V, shall be determined in accordance with Chapter 26 of ASCE 7.*

[From 1611.1] *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.*

[From 1612.3.1] *Obtain and reasonably utilize any design flood elevation and floodway data available from a federal, state or other source.*

[From 2304.12.4] *In geographical areas where hazard of termite damage is known to be very heavy,*

[From 2304.12.2.3] *Supporting member for permanent appurtenances. Naturally durable or preservative treated wood shall be utilized for those portions of wood members that form the structural supports of buildings, balconies, porches or similar permanent building appurtenances where such members are exposed to the weather without adequate protection from a roof, eave, overhang or other covering to prevent moisture or water accumulation on the surface or at joints between members. Exception: Buildings located in a geographical region where experience has demonstrated that climatic conditions preclude the need to use durable materials where the structure is exposed to the weather.*

Cost Impact: The net effect of the public comment and code change proposal will increase the cost of construction The first cost impact is limited to only those regions with high exposure to rain and, within those regions, only to cases where rainscreen claddings or drainage systems are not already employed that meet the requirements. This proposal will serve to decrease cost and improve resiliency over the life-cycle of a building in these high hazard areas. See the original proposal s cost impact statement for more detail.

Public Comment 2:

Proponent: Jay Crandell, P.E., ARES Consulting, representing Foam Sheathing Committee of the American Chemistry Council (jcrandell@aresconsulting.biz)requests As Modified by This Public Comment.

Replace as follows:

2018 International Building Code

1402.2.1 Moist climate zones. Where adhered masonry veneer or cement plaster are used on frame walls in Climate Zones 1A, 2A, or 3A, a ventilated air space shall be provided between the cladding and a water-resistive barrier applied over wood-based sheathing in accordance with Section 2510.6 in addition to a means for draining water to the exterior.

> **Exception:** An air space for ventilation shall not be required where foam plastic insulating sheathing complying with ASTM C 578 or ASTM C 1289 is located between the cladding and the frame wall assembly.

Commenter's Reason: This public comment focuses on the "moist climate zone" portion of the original FS93 proposal. This portion of the original proposal did not receive any opposition at committee hearing. It is consistent with provisions already included in Section 2510.6 of the IBC last code cycle. However, this proposal places these requirements more prominently within the weather protection provisions of Chapter 14. A coordinating change will be made to Section 2510.6 in the Group B hearing cycle.
The only technical change represented in this PC (and also in the original proposal's treatment of moist climate zones) is the exception statement which recognizes an accepted and successful practice for use of foam plastic insulating sheathing behind adhered veneers and stucco cement plaster. The foam sheathing creates a block to inward water vapor drives from reservoir claddings such that a ventilated air-space is not required. Drainage is still required because the exception only applies to the airspace for ventilation.

Cost Impact: The net effect of the public comment and code change proposal will decrease the cost of construction
This proposal is based on language currently on Section 2510.6 (see Exception 2), so there is no cost impact in regard to the existing provisions. However, the exception statement provides potential for cost decrease for assemblies that employ foam plastic insulating sheathing as an alternative means to control inward vapor drives (without eliminating the need to provide a means for drainage).

FS93-18

FS94-18

IBC: 1402.3

Proposed Change as Submitted

Proponent: David Collins, The American Institute of Architects, representing The American Institute of Architects (dcollins@preview-group.com)

2018 International Building Code

Add new text as follows

1402.3 Fenestration. Vertical fenestration and skylights, including windows and doors, shall comply with the International Energy Conservation Code, as applicable.

Reason: The IECC contains detailed requirements regarding doors, windows and skylights which apply to all buildings. Primarily fenestration is located in the exterior walls of the building. Obviously skylights are located in the roof. The IBC already addresses the quantity and fire resistance of openings in Chapter 7. Chapter 14 addresses the overall integrity of exterior walls. Providing energy efficient fenestration is part of the design consideration of exterior walls. The fenestration requirements are somewhat complex and should remain in the IECC, but the existence of the IECC provisions need to be referenced in the IBC to reduce the possibility of them being overlooked.
This proposal is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire safety and hazardous materials in new and existing buildings and facilities and the protection of life and property in wildland urban interface areas. In 2017 the Fire-CAC has held 3 open meetings. In addition, there were numerous conference calls, Regional Work Group and Task Group meetings for the current code development cycle, which included members of the committees as well as any interested parties, to discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: https://www.iccsafe.org/codes-tech-support/cs/fire-code-action-committee-fcac/

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This requirement already exists in the IECC. Inclusions in the IBC doesn't result in any construction not already anticipated.

FS94-18

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The committee deemed the proposed pointer not necessary, indicating users should know to use all the codes. (Vote 14-0).

Assembly Action: **None**

FS94-18

Individual Consideration Agenda

Public Comment 1:

Proponent: David Collins, representing The American Institute of Architects (dcollins@preview-group.com)requests As Submitted.

Commenter's Reason: Criteria for exterior openings in the ICC family of codes address various elements of regulation of openings. The IBC includes limitations for the number and percentage of area permitted in a wall based on the location of the building on a site. The IECC limits the area of the openings based on exposure and the energy efficiency of the opening device (window, door, etc.). It is the responsibility of the designer to determine the implications of these two distinct sets of criteria. All too often the user of the code (designer and code official) over look one in favor of the other. This change is a simple effort to remind all users of the code what the limitations are for fenestrations within the family of codes so that errors will not occur costing loss of important features of code compliance that must be rectified, or worse the owner/user of the facility is impacted by costly failures of the building to perform.

The ICC family of codes includes various pointers to other provisions within its codes or even literally duplicates them to assure their use and appropriate application. This change does the same. We urge your approval of this simple code change.

Cost Impact: The net effect of the public comment and code change proposal will decrease the cost of construction This change will reduce the cost of redesign or changes during the construction process due to inadvertant oversight of important provisions in the ICC Codes.

FS94-18

FS95-18

IBC: 1402.5

Proposed Change as Submitted

Proponent: Tim Earl, GBH International, representing self (tearl@gbhinternational.com)

2018 International Building Code

Add new text as follows

1402.5 Exterior wall envelope. Exterior walls on buildings of Type I, II, III, or IV construction that are greater than 40 feet (12,192 mm) in height above grade plane where the exterior wall envelope contains a combustible material, the complete exterior wall envelope shall be tested as a system in accordance with and comply with the acceptance criteria of NFPA 285 unless compliance with NFPA 285 is specifically exempted elsewhere in this Chapter.

> **Exception:** An exterior wall envelope where the only combustible component is a water-resistive barrier in compliance with section 1402.6.

Reason: This code change proposal is a generic requirement that ensures that all exterior wall envelope systems containing combustible materials must be tested to NFPA 285 as a complete system (if they exceed 40 ft. in height) unless otherwise exempted by other provisions of Chapter 14.
This proposal is followed by a series of proposals addressing various issues associated with combustible materials in exterior walls. The intent of these proposals is to provide a reasonable set of code requirements to ensure fire safety and weather protection for buildings that utilize combustible materials and/or assemblies for the building exterior wall envelope. Just as at present, no testing of completely non-combustible exterior walls would be required.

An alternate proposal addresses added requirements in the case of the presence of projections or interior corners.

The issue of wind effects has been raised but no standard test (or standardized variations of a standard test) exists that can address that.

The definition of “exterior wall envelope” in the IBC makes it clear that it is the “product” that needs to be tested because the fire performance of any system is affected by the fire performance of all its components. Therefore, if each component is fire tested individually and they all meet the requirements, there is no assurance that the entire system (meaning the exterior wall envelope) will perform adequately and meet the requirements.

This was always the intent for fire performance testing and minimum fire safety requirements of the chapter, but the section as currently written is not as clear as it should be. This is intended to address concerns with current language and requirements that could ultimately lead to tragic fires like the one in Grenfell Tower(London, England).

Note: The current definition for EXTERIOR WALL ENVELOPE in the IBC follows:

A system or assembly of exterior wall components, including exterior wall finish materials, that provides protection of the building structural members, including framing and sheathing materials, and conditioned interior space, from the detrimental effects of the exterior environment.

Cost Impact: The code change proposal will increase the cost of construction
While it was always the intent that systems be tested, if users were not testing the entire exterior wall system, they will now be required to do so.

FS95-18

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The committee indicated the proposal was difficult to understand and the issue should be addressed in Section 1405. (Vote 9-5)

Assembly Action: **None**

FS95-18

Individual Consideration Agenda

Public Comment 1:

Proponent: Michael O'Brian, FCAC, representing FCAC (fcac@iccsafe.org)requests As Modified by This Public Comment.

Modify as follows:

2018 International Building Code

1402.5 Exterior wall envelope. Exterior walls on buildings of Type I, II, III, or IV construction that are greater than 40 feet (12,192 mm) in height above grade plane where the exterior wall envelope contains a combustible material other than a water resistive barrier in compliance with Section 1402.6, the complete exterior wall envelope shall be tested as a system in accordance with and comply with the acceptance criteria of NFPA 285 ~~unless compliance with NFPA 285 is specifically exempted elsewhere in this Chapter.~~**~~Exception:~~** ~~An exterior wall envelope where the only combustible component is a water-resistive barrier in compliance with section 1402.6~~
. Exterior wall systems containing foam plastic insulation shall comply with Section 2603.

SECTION 1405 COMBUSTIBLE ~~MATERIALS ON THE EXTERIOR SIDE OF EXTERIOR WALLS~~ EXTERIOR WALL COVERINGS

Commenter's Reason: This public comment is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire safety and hazardous materials in new and existing buildings and facilities and the protection of life and property in wildland urban interface areas. In 2017 the Fire-CAC has held 3 open meetings and in 2018 FCAC held 2 open meetings. In addition, there were numerous conference calls, Regional Work Group and Task Group meetings for the current code development cycle, which included members of the committees as well as any interested parties, to discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: https://www.iccsafe.org/codes-tech-support/cs/fire-code-action-committee-fcac/

This public comment addresses the Committee concerns to make the requirement clearer and more concise that exterior wall systems with combustible components be tested to NFPA 285. The use of the term exterior wall envelope (as opposed to system or other terminology) is consistent with the current definitions (See Below). Any combustible electrical, plumbing or mechanical components would not be included in the NFPA 285 full envelope test, as these are not included the definition of the exterior wall envelope.

This requirement to test the complete exterior wall system is essential to ensure that any wall design with a combination of combustible and noncombustible building components is tested to NFPA 285 in a fashion to ensure the system will appropriately limit fire spread along the outside surface or within the exterior wall envelope. This requirement would prohibit separate testing of individual components which may perform very differently from the complete exterior wall envelope or system.

Current IBC definitions:

EXTERIOR WALL ENVELOPE. A system or assembly of exterior wall components, including exterior wall finish materials, that provides protection of the building structural members, including framing and sheathing materials, and conditioned interior space, from the detrimental effects of the exterior environment.

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, facias, gutters and leaders.

Cost Impact: The net effect of the public comment and code change proposal will increase the cost of construction While it was always the intent that systems be tested, if users were not testing the entire exterior wall system, they will now be required to do so.

FS95-18

FS96-18

IBC: 1402.6 (New), 1402.6.1 (New), 1402.6.2 (New), 1402.6.3 (New), 1402.6.4 (New), 1402.6.5 (New), 1402.6.6 (New), 1402.6.7 (New), 1402.6.8 (New), 1402.6.9 (New), 1402.6.10 (New), 1402.6.11 (New), 1402.6.12 (New), 1402.6.13 (New), 1402.6.14 (New), 1402.6.15 (New), 1402.6.16 (New), 1402.6.17 (New), 1402.6.18 (New), 1402.6.19 (New), 1402.6.20 (New), 1402.6.21 (New), 1402.6.22 (New), 1402.6.23 (New), Chapter 35

Proposed Change as Submitted

Proponent: Ronald Nickson, Nickson Code Consulting, representing Rockwool (nicksoncodeconsulting@gmail.com)

2018 International Building Code

Add new text as follows

1402.6 Flame spread of wall and attic protection. Where a building is not required to comply with NFPA 285, the exterior walls, or combination of exterior walls and eaves shall comply with Section 1402.6.20 when subject to fire testing in accordance with Sections 1402.6.2 through 1402.6.23.

Exceptions:

1. When there is or no observed flame spread above the lower 8 feet of the 16-foot test assembly, the wall assembly being tested is considered to have passed the test and is acceptable for use on the exterior of buildings.
2. Where eaves are located at a height greater than 8 feet above grade, the wall includes a gable vent or the building is designed with a parapet and low sloped roof, the exterior wall system above 8 feet from grade can be constructed using any alternative approved materials, provided the assembly of the lower 8 feet above grade of the wall assembly is permitted in accordance to Exception 1 to Section 1402.6.

1402.6.1 Wall sections deemed to comply. Wall assemblies listed below are deemed to comply with Section 1402.6 when the water-resistant barrier is the only combustible component and the water-resistive barrier has a peak heat release rate of less than 150 kW/m^2, a total peak heat release of less than 20 MJ/m^2 and an effective heat of combustion of less than 18 MJ/kg as determined in accordance with ASTM E1354 and has a flame spread index of 25 or less and a smoke-developed index of 450 or less as determined in accordance with ASTM E84 or UL 723. The ASTM E1354 test shall be conducted on specimens at the thickness intended for use, in the horizontal orientation and at an incident radiant heat flux of 50 kW/m^2.

1. The following wall assemble is deemed to comply with Section 1402.6 and is acceptable for use on the exterior wall of buildings when the attic space, exterior wall with gable vents, or parapet with low sloped roofs are more than 16 feet above grade plane. The wall assembly is required on the lower portion of the wall to a height of 16-feet above grade plane.

   1.1. Vinyl siding over water-resistant barrier and 1/2 inch plywood.
2. The following wall assemblies are deemed to comply with the Exception to Section 1402.6 and are acceptable for use on all exterior walls. The wall assembly is required on the lower portion of the wall to a height of 8-feet above grade plane.

   2.1. Fiber cement siding over water-resistant barrier and 1-inch R-5 EPS.
   2.2. 3/8-inch base coat stucco over water-resistant barrier and 1/2-inch plywood.
   2.3. 3/8-inch base coat stucco over water-resistant barrier, 1-inch R-5 EPS and 1/2-inch plywood.
   2.4. EIFS with 3/16-inch base coat of fiberglass mesh w/acrylic finish over water-resistant barrier and 1/2-inch plywood.
   2.5. EIFS with 3/16-inch base coat of fiberglass mesh w/acrylic finish over water-resistant barrier 1.5-inches EPS and 1/2-inch plywood.
   2.6. Vinyl siding over water-resistant barrier, mineral wool boards and 1/2-inch OSB.

1402.6.2 Fire test. This fire-test-response procedure prescribes a method to assess the fire performance of a vertically oriented specimen, eave projection and roof that encloses an attic space, exposed to direct flame impingement in a simulated external fire. When tested in accordance with 1402.6, when present, the eave construction shall be uniform and continuous around the perimeter of the test specimen.

1402.6.3 Test assembly. The test assembly wall dimensions shall be 16 feet wide and 16 feet high and have a supporting wall on each end that extends back 8 feet at a 90-degree angle to the 16-foot wall. The eave shall be

constructed as an 18-inch projection, extending horizontally from the top of the 16-foot wall section. The roof and attic spaces shall be constructed such that the roof extends from the projection's fascia at an angle of 6:12. The roof shall be covered with 5/8-inch OSB roof sheathing and roofing materials. The roof members shall have an intermediate supporting vertical member extending from the top of the 16-foot wall as well as at the ends of the 8 foot walls.

1402.6.4 Joint detail. The test assembly shall incorporate joint detail(s) representative of actual installation.

1402.6.5 Wall detail. The wall assembly used as the test specimen shall include sheathing, weather barrier and cladding attached to the exterior surface of the structural support elements.

1402.6.6 Wall material. For wall assemblies composed of layered materials, such as sheathing, water-resistive barrier, continuous exterior insulation and siding (cladding), the installation of such layered materials shall be in accordance with the manufacturer's instructions, or in the absence of such instructions, applicable building code requirements. In the absence of manufacturer's specifications, the wall assembly shall include the following minimum components: nominal 2x4 studs spaced 16 in (410 mm) on center, and the desired exterior siding material. If sheathing is used, tests shall be run on typical 7/16 in. oriented strand board (OSB) of Exposure 1 rating. Where specified by the manufacturer, sheathing materials and installation shall be in accordance with the manufacturer's instructions. The type, thickness, and installation method of any sheathing method of any sheathing shall be included in the report.

1402.6.7 Accelerated aging/weathering and pre-test conditions of test material. When required by a regulatory or other agency a pre-test accelerated aging/weathering of the samples shall be completed. The manufacturer shall have the option to conduct such weathering. Weathering shall be conducted as specified by the regulatory agency or applicable methods as specified for the product. Details of the weathering method used, or reference to a standard test method, shall be included in the report.

1402.6.8 Test samples. Two hygroscopic samples of each materials from the same stock from which the test assembly was constructed shall be tacked to the test assembly during construction in such a manner that they are easily removed. These pieces shall be conditioned with the completed test specimen.

1402.6.9 Storage. The completed test assemblies and samples shall be stored indoors at temperatures not lower than 60ºF (16ºC) nor higher than 90ºF (32ºC) for the period of time necessary to cure the assembly components. Test assemblies are to be stored so that each will be surrounded by freely circulating air.

1402.6.10 Sample testing. Just prior to the assembly testing, the pieces of hygroscopic materials prepared in 705.2.5.2.1 shall be tested for moisture content.

1402.6.11 Moisture determination. Samples of like materials shall be reported as the average. For lumber and other wood-based materials, use Test Method ASTM D4442. Alternatively, the moisture content for lumber and other wood-based materials is permitted to be measured using a moisture meter. For other hygroscopic materials, use test methods appropriate for those materials.

1402.6.12 Lumber used in the construction of the supporting wall structure. The moisture content shall not be more than 12 percent. For wood sheathing, the moisture content shall not exceed 8%. For other hygroscopic materials, the moisture shall be within ranges specified by the manufacturer before the assembly is constructed. These specified ranges shall be typical for exposure.

1402.6.13 Burner details. The ignition source for the test shall be gas diffusion burner with a nominal 4 in. wide by 39 in. (100 mm wide by 1000 mm) long porous top surface of a refractory material. With the exception of top surface dimensions, the essential configuration of the burner is comparable to the burner design describe in Test Method E2257.

1402.6.14 Burner enclosure. The burner enclosure shall be positioned so that it is centered relative to the width of the16-foot test wall. The distance from the bottom of the test assembly to the top surface of the burner shall be 12 plus or minus 2 inches. (300 plus or minus 50 mm). The bottom of the test assembly shall be protected from burner fire exposure by the placement of a 4 foot (1220 mm) wide thermal barrier.

1402.6.15 Procedure. The ambient temperature in the test room shall be above 60ºF (15ºC) and the relative humidity shall be less than 75 percent. The test room shall be draft-protected and equipped with an exhaust hood system for removal of products of combustion during the test.

1402.6.16 Horizontal air flow. The horizontal air flow, measured at a horizontal distance of 20 inches. (0.5m) from the edge of the wall assembly, shall not exceed 1.64 feet per second (0.5 m/s).

1402.6.17 Test assembly position. Prior to testing position the test assembly under the exhaust hood and set the gas burner for the prescribed level of output.

1402.6.18 Burner output. Once the burner output is verified, position the specimen holder assembly at the desired test location under the collection hood.

1402.6.19 Burner ignition. Simultaneously ignite the gas burner and start the timer marking the beginning of the test. Control the burner to a constant 100 kw output. Control the hood duct flow to collect all products of combustion.

1402.6.20 Flame exposure. Continue the flame exposure for a period of 20 minutes, or until such time that observations of flames in the attic space have been made. The specimen will have passed the test if no flame intrusion was observed into the attic space.

1402.6.21 Documentation. Perform photographic or video documentation, or both, before, during and after each test.

1402.6.22 Report. The report shall include the following:

1. Name and address of the testing laboratory.
2. Name and address of test sponsor.
3. Description of the test assembly including construction details of the wall system, details of individual components and the manufacturer's installation details and limitations as applicable.
4. Number of specimens tested.
5. Conditioning of test assemblies.
6. Pre-test accelerated aging/weathering exposure, as applicable.
7. Moisture content of hygroscopic elements of the wall system construction at the time of testing.
8. Details of the calibration including heat supply rate.
9. Date of test, identification number and date of report.

1402.6.23 Test Results. The test results shall include:

1. A notation of the time and location of the breach of the flame into the attic space.
2. A determination of the presence of glow on the unexposed side of the assembly at the end of the 60-minute observation period.
3. Observations of the burning characteristics of the exposed surface of the test during and after the test exposure.

Add new standard(s) follows

ASTM

ASTM International
100 Barr Harbor Drive, P.O. Box C700
West Conshohocken PA 19428-2959
US

D4442-16:

Standard Test method for Heat and Visible Smoke Release Rates for Materials and Products Using an Oxygen Consumption Calorimeter

E2257-17:

Standard Test Method for Room Fire Test of Wall and Ceiling Materials and Assemblies

---

Reason: The proposed change establishes a material-neutral, engineering solution, that allows for a wide range of options and design solutions to address the issue of fire spreading across the exterior wall and breaching the attic space, from fires that originate on the exterior of a building. The risks associated to exterior fires of this type have been rising dramatically due to changes in the energy code that require more wall insulation. The increased insulation can be accommodated by increasing the wall thickness and installing more insulation in the wall cavity or by adding continuous insulation to the exterior of the more typical 2x4 or 2x6 wall. The exterior insulation does not present a fire hazard if it is non-combustible or protected in a way to prevent the insulation from being involved in a fire originating near the exterior wall from fires in nearby buildings, landscaping and in some cases radiative heat from the windows of a nearby building. This code proposal incorporated into the IBC is a means to evaluate the spread of fire on the exterior of buildings that also includes testing to determine if the fire spreads into the attic. The provisions in the proposal are based on fire

testing research performed at UL, Fire Service Summary Report: Study of Residential Attic Fire Mitigation Tactics and Exterior Fire Spread Hazards on Firefighter Safety, funded by the Department of Homeland Security, and UL fire test, Verification Services Project for Exterior Wall Mock-up Fire Demonstration with Comfortboard 80 Insulation Products. Work is now underway with UL/ANSI to develop a standard that can be referenced in future editions of the ICC Codes. Section 1402.6.1 adding the list of wall configurations deemed to comply includes wall assemblies that were tested in the above referenced test by UL. Based on that testing the listed wall assemblies would comply with the test procedure proposed by this code change. The section is based on provisions in the IECC that lists materials and assemblies that are deemed to comply with the IECC requirements for air leakage.

A report from NFPA Research entitled, Residential Structure Fires Originating On Outer Walls, Spreading On Exterior Walls Or Trim, and Beginning On An Outer Wall with Plastic, January 2018, identifies the problem that now exists because of the increased use of unprotected combustible products used to meet the current energy code requirements. The report documents the number of residential fires where the item contributing most flame spread was exterior sidewall covering and surface finish. From 2005 to 2015, this type of fire occurs on average 7663 times per year, causing an annual average of 50 casualties, 345 injuries and $539 million in property loss.

UL fire test, Verification Services Project for Exterior Wall Mock-up Fire Demonstrations with Comfortboard 80 Insulation Products has shown that a fire can reach the attic in a building through the soffit in 2-3 minutes in buildings with unprotected combustible products in the exterior wall. In buildings with light siding and non-combustible insulation, tested using the same procedure, the exterior of the building does not catch on fire and thus the issue of the fire getting into the attic never happens.

The methodology proposed for fire testing in this proposal, assess the flame spread of the exterior wall and the time it takes for a fire to breach the attic space. To have a complete solution to the spread of fire into the attic it is imperative that the exterior wall meet the criteria in Section 1405.1 concerning Combustible Materials on the Exterior Side of Exterior Walls. A companion change has been submitted to add Type V construction to the section.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The cost impact if any is minor. Some cost will be incurred by material manufacturers to determine compliance with the required test procedure. Material and installation cost are basically natural.

Analysis: A review of the standard proposeds for inclusion in the code, ASTM E2257-17 and ASTM D4442-16, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2018.

FS96-18

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The committee determined the modification (Nickson 8) was out of order, upon which the proponent requested disapproval. The committee disapproved, noting the language was cumbersome and complex, and there was no merit without the modification. (Vote 14-0)

Assembly Action: **None**

FS96-18

Individual Consideration Agenda

Public Comment 1:

Proponent: Ronald Nickson, representing Rockwool (nicksoncodeconsulting@gmail.com)requests As Modified by This Public Comment.

Replace as follows:

2018 International Building Code

1402.6 Flame spread up the exterior wall surface. Where a building is not required to comply with NFPA 285, exterior walls and exterior walls with eaves shall comply with Section 1402.6.1.

1402.6.1 Wall sections deemed to comply. Wall assemblies specified in Sections 1402.6.1.1 and 1402.6.1.2 are deemed to comply with Section 1402.6 where the water-resistant barrier is the only combustible component provided the water-resistant barrier complies with both of the following:

1. A peak heat release rate of 150 kW/m, a total peak heat release of less than 20 MJ/m and an effective heat of combustion of less than 18 MJ/kg as determined in accordance with ASTM E1354.
2. A flame spread index of 25 or less and a smoke-developed index of 450 or less as determined in accordance with ASTM E84 or UL 723.

The ASTM E1354 test shall be conducted on a specimen at the thickness intended for use, in the horizontal orientation and at an incident radiant heat flux of 50 kW/m^2.

1402.6.1.1 Wall Assembly The following wall assembly, with no external insulation, is deemed to comply with Section 1402.6 and is acceptable for use on the exterior wall of buildings when the attic space, exterior wall with gable vents, or parapet with low sloped roof is more than 16 feet (4880 mm) above grade plane:
Vinyl siding over water-resistant barrier and 1/2 inch wood structural panel.

1402.6.1.2 Deemed to comply wall assemblies. The following wall assemblies are deemed to comply with Section 1402.6 and are acceptable for use on the lower 8 feet (2440 mm) of all exterior walls. The materials of exterior wall systems shall not be limited above the lower 8 feet above grade where eaves are located at a height greater than 8 feet (2440 mm) above grade, where the wall includes a gable vent, or where the building is designed with a parapet and a low sloped roof, provided the wall assembly of the lower 8 feet (2440 mm) above grade consists with one of the following:

1. Fiber cement siding over 1 inch polystyrene water-resistant barrier and 1/2 inch wood structural panel.
2. Fiber cement siding over mineral wool insulation, water-resistant barrier and 1/2 inch wood structural panel.
3. 3/8 inch base coat stucco over water-resistant barrier and 1/2 inch wood structural panel.
4. 3/8 inch base coat stucco over 1 inch polystyrene water-resistant barrier and 1/2 inch wood structural panel.
5. Any thickness base coat stucco over mineral wool insulation, water-resistant barrier and 1/2 inch structural panel.
6. EIFS with 3/16 inch base coat of fiberglass mesh with acrylic finish over 1.5 inch EPS, water-resistant barrier and 1/2 inch structural panel.
7. EIFS with any thickness of base coat and finish coat over mineral wool insulation, water-resistant barrier and 1/2 inch wood structural panel.
8. Vinyl siding over mineral wool insulation, water-resistant barrier and 1/2 inch wood structural panel.
9. 8 inch wood lap siding over water-resistant barrier and 1/2 inch wood structural panel.
10. 8 inch wood lap siding over mineral wool insulation, water-resistant barrier and 1/2 inch wood structural panel.
11. Wall assemblies where the foam plastic insulation is covered on each face by not less than 1-inch (25mm) thickness of masonry or concrete and meeting one of the following:

    11.1. There is no airspace between the insulation and the concrete, masonry or thermal barrier.
    11.2. The insulation has a flame spread index of not more than 25 as determined in accordance with ASTM E84 or UL 723 and the maximum airspace between the insulation and the concrete, masonry or thermal barrier is not more than 1 inch (25 mm).

Commenter's Reason: The public comment, supported by the ICC Fire Code Action Committee (FCAC) and the National Association of State Fire Marshals (NASFM), simplifies and revises the original proposal to a listing of the wall configurations that are acceptable when the exterior wall is not required to comply with IBC Section 1402.5, which requires walls greater than 40 feet in height to be tested in accordance with NFPA 285. The proposal is in response to the recent changes in the IECC for increased insulation, which in some cases is installed on the exterior of the wall and can contribute to the spread of fire up the exterior wall. This concern is documented by NFPA and the U.S. Fire Administration's National Fire Incident Reporting System (NFIRS 5.0) which documents that there is an annual average of 7645 residential fires that spread on the exterior wall surface with 50 casualties, 345 injuries and $539M in property damage.
The deemed to comply wall configurations are based on testing completed by UL following the procedures of ASTM E2707 with various burner flame ignitions ranging from 50 kW - 300 kW. Of the 32 test completed, 20 were with a flame ignition of 100 kW. The 100 kW flame was selected as the basis for the original proposal, this public comment and the deem to comply wall configurations because it allows for testing of the flame spread up the exterior of the wall as compared to the 150 kW basis for ASTM E2707 which is designed for flame penetrations thru the wall. The tests completed by UL were either 2x4 or 2x6 walls with structural wood panels (plywood or OSB) and different exterior materials. Walls with non-combustible siding, such as EIFS, stucco, fiber cement over no insulation or a combustible insulation had no sustained ignition when exposed to the 100 kW fire in the UL testing. Walls with no sustained ignition are included in the proposal as deemed to comply wall configurations. Other wall configurations with mineral wool exterior insulation are also included as deemed to comply based on testing done on walls with mineral wool exterior insulation which also had no flame spread up the exterior surface of the wall. Walls with siding that melted (vinyl) and mineral wool insulation also passed the test. Walls with a siding that melted with foam plastic insulation failed the test. Vinyl siding over structural wood panels (no exterior insulation) passed the test when the wall was 16 feet high.

The UL testing is reported in two reports: (1) Study of Residential Attic Fire Mitigation Tactics and Exterior Fire Spread Hazards on Fire Fighter Safety (available at: https://ulfirefightersafety.org/docs/Attic-Final-Report-Online.pdf), and (2) Verification Services Project for Exterior Wall Mock-up Fire Demonstration with Comfortboard 80 Insulation (available by request from proponent).

The deemed to comply wall sections include the majority of current wall configurations. Other wall configurations can be approved by the code official per IBC Section 104.11 Alternative materials, designs and methods of construction and equipment.

Cost Impact: The net effect of the public comment and code change proposal will increase the cost of construction
In zones 6-7 there could be a cost increase depending upon the design and the basis for cost consideration. However, in zones 1-5 and 8 design using the U-value configuration for solution and code compliance as compared to the R-value code solution are available that will reduce the cost of construction.

Public Comment 2:

Proponent: John Woestman, Kellen Company, representing Extruded Polystyrene Foam Association (jwoestman@kellencompany.org); Justin Koscher, Polyisocyanurate Insulation Manufacturers Association (jkoscher@pima.org); Jay Crandell, ARES Consulting, representing Foam Sheathing Committee of the American Chemistry Council (jcrandell@aresconsulting.biz) requests Disapprove.

Commenter's Reason: Please support the Committees unanimous vote for disapproval. In the original proposal, the proponent created a fire test to address a problem that was not substantiated.
The proponent then attempted to move a floor modification and described a substantial change to an existing consensus-based standard (ASTM E2707) using the code development process. Although his request was ruled out of order, the proponent stated he would bring it back in Public Comment.

In both cases, Section 3.6.3.2 of ICC CP-28 states that the standards referenced by the ICC codes shall be developed and maintained through a consensus process such as ASTM or ANSI. The modifications to the ASTM standard have not been vetted through a consensus process by a balanced group of stakeholders, as evidenced by the significant alterations and scope of the public comment.

Although the original FS96-18 cited a number of citations justifying the need for and providing a fire test as a response, for this change, no details have been submitted. One of these reports included a UL research program which was to develop improved firefighter tactics by providing the fire service with scientific knowledge on the dynamics of attic and exterior fires. The applicability of this work to FS96-18 is unknown.

This topic belongs in a consensus standard setting organization such as ASTM and should not be included in the IBC until this work is completed.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This public comment requests disapproval - the code will not be changed with support of this public comment.

FS96-18

FS99-18

IBC: 1402.5, 1402.5.1, Table Table 1402.5

Proposed Change as Submitted

Proponent: Jeffrey Shapiro, Lake Travis Fire Rescue, representing Lake Travis Fire Rescue (jshapiro@ltfr.org)

2018 International Building Code

Revise as follows

1402.5 ~~Vertical and lateral~~ Fire testing of exterior walls for flame propagation. *Exterior walls* on buildings of Type I, II, III or IV construction that are greater than 40 feet (12 192 mm) in height above grade plane ~~and contain a combustible *water-resistive barrier* shall be tested~~ that include combustible components shall be tested for flame propagation in accordance with and comply with the acceptance criteria of ~~NFPA 285.~~ the test methods in Table 1402.5. The complete exterior wall envelope shall be tested. For the purposes of this section, fenestration products, flashing of fenestration products and water-resistive-barrier flashing and accessories at other locations, including through wall flashings, shall not be considered part of the water-resistive ~~barrier.~~barrier.

Exceptions:

1. Walls in which the *water-resistive barrier* is the only combustible component and the *exterior wall* has a wall covering of brick, concrete, stone, terra cotta, stucco or steel with minimum thicknesses in accordance with Table 1404.2.
2. Walls in which the *water-resistive barrier* is the only combustible component and the *water-resistive barrier* has a peak heat release rate of less than 150 kW/m^2, a total heat release of less than 20 MJ/m^2 and an effective heat of combustion of less than 18 MJ/kg as determined in accordance with ASTM E1354 and has a flame spread index of 25 or less and a smoke-developed index of 450 or less as determined in accordance with ASTM E84 or UL 723. The ASTM E1354 test shall be conducted on specimens at the thickness intended for use, in the horizontal orientation and at an incident radiant heat flux of 50 kW/m^2.

Add new text as follows

1402.5.1 Supplemental requirements for test method. Where compliance with this section is required by Table 1402.5, the following shall apply:

1. Where an exterior wall will include one or more horizontal projections, the wall assembly shall be tested in accordance with NFPA 285 using a test sample that incorporates a horizontal projection that extends 5 feet from the exterior wall surface and is located 36 inches above the window opening. The tested assembly shall be required to comply with the acceptance criteria of NFPA 285.
2. Where an exterior wall will include one or more interior corners, the wall assembly shall be tested in accordance with one of the following options:

   2.1 NFPA 285 using a test sample that incorporates a corner that is located at the left or right edge of the window opening and extends an exterior wall surface at a right angle to the plane of the window that creates a 5 foot deep interior corner. The tested assembly shall be required to comply with the acceptance criteria of NFPA 285.

   2.2 NFPA 285 using the standard wall assembly and an additional test using the 16 foot parallel panel test specified in FM 4880. The tested assembly shall be required to comply with the acceptance criteria of both NFPA 285 and FM 4880.
3. Where an exterior wall will include both horizontal projections and interior corners, the wall shall be tested in accordance with both Item 1 and Item 2.
4. Tests in Item 1 and Item 2.1 shall be conducted with wind applied at 60 second intervals, accomplished by cycling the fan or fans on and off for the duration of the test. Fans shall apply a uniformly distributed wind speed of 30 feet per second to the face of the test assembly when running at full speed.

Table 1402.5
REQUIRED EXTERIOR WALL FIRE TEST METHOD

Exterior Wall Configuration[a]	**Required Test Method**
Flat wall surface	NFPA 285
Projections or interior corners	See Section 1402.5.1

a. Where no projections or interior corners exceed 12 inches, measured perpendicular to the wall surface, the wall is considered to be a flat wall surface

Reason: For the past year, I have been attempting to get the NFPA 285 committee to consider adjustments to the NFPA 285 test procedure to address the issues of building geometry and wind. My approach has been to fight attempts to expand the use of NFPA 285 to include any wall assembly until changes are made to the standard to address these concerns. The development process for NFPA 285 has been very contentious on this issue, with the committee completely reversing course from one meeting to the next, and ultimately, the NFPA Standards Council refused to issue the latest update and returned the entire document to the technical committee.
The fire service has very little voice in the NFPA 285 process compared to industry interests, and it has been very difficult to get the committee to give these concerns due consideration, and on this issue, I am representing the perspective of the fire service and a code official. Lacking the ability to get appropriate consideration from the NFPA 285 technical committee, I am seeking to get the IBC to establish parameters for exterior wall tests that would be dictated to anyone writing test protocols for IBC buildings with walls regulated by this section.

The fire service is well aware of the effects of wind driven fires and of building geometry when it comes to fire behavior, and we can ill afford the risk of catastrophic high-rise fires involving exterior walls. While it has been claimed that there have been no such documented losses involving NFPA 285 compliant panels on buildings, the lack of a bad fire does not equate to a conclusion that everything is fine. Instead, numerous catastrophic exterior fires that have occurred just happened to occur on buildings with non-compliant walls assemblies. What would have happened if NFPA 285 compliant panels were used? Nobody can say for certain.

The current NFPA 285 test method is scoped to ONLY include non-bearing geometrically flat curtain walls attached to buildings, and I have no issue with the current test method continuing for this application. However, the effectiveness of this test method for assemblies with overhangs and inside corners that can intensify the fire exposure needs to be known before these untested geometric variations should be permitted by NFPA 285 or the IBC. UL's mantra is "know by test." We haven't tested, therefore, we don't know.

The addition of a wind application to the proposed samples with overhangs and/or corners recognizes that wind turbulence is likely to further increase fire intensity. Inside corners will form a flame vortex, and overhangs are expected to concentrate heat beneath the overhang. Either could cause an assembly that might pass the basic NFPA 285 test to fail.

The suggested parameters for the depth of extensions and wind speed (which approximately equates to 20 mph) are my best estimate, as a fire protection engineer and former firefighter, at a reasonable test. I have asked a variety of individuals involved in this issue to offer suggestions or run sample tests and got nowhere.

The fire service would be unwise to accept the risk of catastrophic high-rise fires by knowingly standing by while the NFPA 285 test method is exploited. Without knowing the fire performance consequences of stretching the test method to allow assemblies that are not well represented in the test, we cannot reasonably assure public safety or firefighter safety. We must do a better job of making sure we get this issue right because Grenfell Tower was a wake up call with respect to the consequences of inadequate testing. Do we really want to allow buildings to be built with untested wall configurations only to later learn that we screwed up and created a large pool of dangerous existing buildings? The time to address these concerns is now, before NFPA 285 loses its current scoping constraints and before tall wood buildings gain access to a test method that wasn't designed for that application.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Currently, NFPA 285's scope is limited to not include all types of wall assemblies that are being addressed by this proposal. Compliance with additional tests being proposed may or may not have an impact on the cost of construction, depending on whether existing assemblies and materials are able to pass the proposed test protocols.

FS99-18

Public Hearing Results

Errata: The table did not appear in the CAH.

Committee Action: Disapproved

Committee Reason: The committee concluded there are too many questions of how wall geometry and wind are considerations in the testing procedures, there is no standardized method for measuring the effects of wind on fire, and it is not known how wind will effect buildings over 40'. (Vote 14-0).

Assembly Action: None

FS99-18

Individual Consideration Agenda

Public Comment 1:

Proponent: Stephen DiGiovanni, representing self (sdigiovanni@clarkcountynv.gov)requests As Modified by This Public Comment.

Replace as follows:

2018 International Building Code

1402.5 Vertical and lateral flame propagation. *Exterior walls* on buildings of Type I, II, III or IV construction that are greater than 40 feet (12 192 mm) in height above grade plane ~~and contain a combustible *water-resistive barrier*~~ that include combustible components shall be tested ~~in~~ for flame propagation in accordance with and comply with the acceptance criteria of NFPA 285. For the purposes of this section, *fenestration* products, flashing of *fenestration* products and *water-resistive-barrier* flashing and accessories at other locations, including through wall flashings, shall not be considered part of the *water-resistive barrier*.

Exceptions:

1. Walls in which the *water-resistive barrier* is the only combustible component and the *exterior wall* has a wall covering of brick, concrete, stone, terra cotta, stucco or steel with minimum thicknesses in accordance with Table 1404.2.
2. Walls in which the *water-resistive barrier* is the only combustible component and the *water-resistive barrier* has a peak heat release rate of less than 150 kW/m^2, a total heat release of less than 20 MJ/m^2 and an effective heat of combustion of less than 18 MJ/kg as determined in accordance with ASTM E1354 and has a flame spread index of 25 or less and a smoke-developed index of 450 or less as determined in accordance with ASTM E84 or UL 723. The ASTM E1354 test shall be conducted on specimens at the thickness intended for use, in the horizontal orientation and at an incident radiant heat flux of 50 kW/m^2.

1402.5.1 Supplemental tests for exterior walls with projections. Where an exterior wall includes projections that exceed 24 inches as measured from the exterior wall, the complete exterior envelope shall be tested in accordance with one of the following options:

1. NFPA 285 using a standard wall assembly, and additional that incorporates a wing wall that is located at the edge of the window opening and extends 5 feet perpendicularly from the plane of the wall and the full height of the test sample, and is constructed with identical materials and methods as the test sample. The heat flux specified at a height of 2.0 ft above the window opening shall be increased by 100% to double the heat flux from that prescribed by NFPA 285. The tested assembly shall be required to comply with the acceptance criteria of NFPA 285.
2. NFPA 285 using the standard wall assembly and an additional test using the 16 foot parallel panel test specified in FM 4880. The tested assembly shall be required to comply with the acceptance criteria of both NFPA 285 and FM 4880.

Commenter's Reason: Exterior wall fire spread is an ongoing concern in the fire safety community. During code hearings, there were a variety of proposals intended to bolster the exterior wall testing requirements from the IBC. These proposals addressed a variety of issues, such as projections and wind. Of the many proposals, only FS98-18 and

FS105-18 were approved. FS98 changed the title to Section 1402.5 to "Water Barriers" and FS105 added an exception to allow additional materials to be water-resistive barriers; essentially, none of the approved proposals addressed exterior flame spread of other materials or address projections or wind.

As both FS98 and FS105 reinforce the use of Section 1402.5 as a means to address combustibility of the water resistive barrier, this proposal seeks to separate the issue of exterior wall flame spread. As such, this proposal is submitted to change the existing code section 1402.5, and then add a subsection thereto. In addition, this proposal can work with any other public comments that may clarify the language from the 2018 Section 1402.5, as the true technical change is added as a standalone subsection. Regardless of whether solely through this public comment or in conjunction with others, by having new code sections, the code is clear in requiring exterior wall tests be conducted for the purpose of exterior flame spread analysis, separate from those requirements to address the water barrier material.

The original proposal addressed both vertical (i.e. re-entrant angle wall) and horizontal (i.e. balconies) projections. This comments seeks to maintain the vertical projection by the addition of the wing wall. The balcony style horizontal projection is not addressed, as there is concern that the balcony feature would act as a fire block material that could potentially allow a wall assembly to pass, when it otherwise would not.

The wing wall is substantiated by observation of other international exterior wall test standards. For instance, the wing wall is a feature that is already incorporated into standards such as ISO 13785 and BS 8414. Please note that the proposed NFPA 285 wing wall requirements for 5 feet depth and alignment with a window edge are similar features to those present in the aforementioned international standards.

For the issue of wind, there are two impacts to consider. First, wind is expected to change the geometry of the flame front by moving the flame around, and potentially away from, the wall. While there are scenarios where the geometry effects would increase flame spread, there are just as likely scenarios where the geometry changes would allow a wall to pass, when it otherwise would not. Second, wind is expected to increase fire intensity. While the issue of geometry yields an inconclusive effect, there is no doubt that an increase in fire intensity during testing will result in a more rigorous test procedure.

Again, in observing the international tests, the exterior heat flux immediately above the window opening (0.6 m above) are somewhat greater than that provided for in NFPA 285. In time increments, the NFPA 285 heat flux requirements at 2 feet (610 mm) above the window opening range up to a maximum of 3.8w/cm2, However, the heat flux for BS 8414, for instance, is approximately 7.5 w/cm2 at a height of 0.6 m above the window opening. This represents an increased heat flux of approximately double the heat flux requirement of NFPA 285. As a 100% increase is seen as a significant increase in heat flux, the proposal seeks to require that this increased heat flux be used for the option that utilizes NFPA 285 testing only.

As provided in the original proposal, this comment provides an option to use a standard NFPA 285 test, and associate this with the FM 4880 parallel panel test. As FM 4880 has increased heat flux, and addresses the issue of projections by facing the panels to each other, this comment agrees that the FM 4880 test is a suitable option for this purpose.

In summary, the issue of exterior wall flame spread is current and present, and there is a need to bolster our requirements. This proposal seeks to provide reasonable increases to current acceptance criteria, which are already present in other test standards, in order to address the current exterior wall flame spread issues.

Cost Impact: The net effect of the public comment and code change proposal will increase the cost of construction Currently, NFPA 285 (without modification) is accepted for all wall assemblies. This proposal will require additional testing for wall assemblies, which will likely result in construction cost increases as these additional test costs and passed on.

Public Comment 2:

Proponent: Michael O'Brian, FCAC, representing FCAC (fcac@iccsafe.org); Jeffrey Shapiro, Lake Travis Fire Rescue (jshapiro@ltfr.org)requests As Modified by This Public Comment.

Replace as follows:

2018 International Building Code

1410 VERTICAL AND LATERAL FLAME PROPAGATION FIRE TEST

1410.1 General. Where another section of this code requires fire testing to comply with this section, testing to determine the fire propagation characteristics shall comply with Sections 1410.1.1 through 1410.1.3

1410.1.1 Test Procedure. Testing shall be conducted in accordance with NFPA 285.

1410.1.2 Acceptance criteria. The test specimen shall comply with the NFPA 285 acceptance criteria.

1410.1.3 Application of test results. Test results shall be applied in accordance with one of the following:

1. NFPA 285 Test results shall be directly applicable to exterior wall assemblies and panels used as components of curtain wall assemblies, which are installed without interior corners or horizontal projections that exceed 12 inches as measured perpendicular to the wall surface.
2. For conditions not covered by Item 1, application of the NFPA 285 test results shall be subject to the approval of the building official based on the recommendation of a registered design professional prepared in accordance with Section 104.11.

Evaluation of the suitability of the proposed exterior wall for the intended installation shall include the possible need for: testing an assembly with interior corners and horizontal projections, increasing the severity of the NFPA 285 fire exposure, and conducting additional tests using other approved exterior wall test methods.

718.2.6 Exterior wall coverings. *Fireblocking* shall be installed within concealed spaces of exterior wall coverings and other exterior architectural elements where permitted to be of combustible construction as specified in Section 1405 or where erected with combustible frames. *Fireblocking* shall be installed at maximum intervals of 20 feet (6096 mm) in either dimension so that there will be no concealed space exceeding 100 square feet (9.3 m^2) between *fireblocking*. Where wood furring strips are used, they shall be of *approved* wood of natural decay resistance or preservative-treated wood. If noncontinuous, such elements shall have closed ends, with not less than 4 inches (102 mm) of separation between sections.

Exceptions:

1. *Fireblocking* of cornices is not required in single-family dwellings. *Fireblocking* of cornices of a two-family dwelling is required only at the line of dwelling unit separation.
2. *Fireblocking* shall not be required where the exterior wall covering is installed on noncombustible framing and the face of the exterior wall covering exposed to the concealed space is covered by one of the following materials:

   2.1. Aluminum having a minimum thickness of 0.019 inch (0.5 mm).
   2.2. Corrosion-resistant steel having a base metal thickness not less than 0.016 inch (0.4 mm) at any point.
   2.3. Other *approved* noncombustible materials.
3. *Fireblocking* shall not be required where the exterior wall covering has been tested in accordance with ~~, and complies with the acceptance criteria of, NFPA 285~~Section 1410. The exterior wall covering shall be installed as tested in accordance with ~~NFPA 285~~Section 1410.

1402.5 Vertical and lateral flame propagation. *Exterior walls* on buildings of Type I, II, III or IV construction that are greater than 40 feet (12 192 mm) in height above grade plane and contain a combustible *water-resistive barrier* shall be tested in accordance with ~~and comply with the acceptance criteria of NFPA 285~~Section 1410. For the purposes of this section, *fenestration* products, flashing of *fenestration* products and *water-resistive-barrier* flashing and accessories at other locations, including through wall flashings, shall not be considered part of the *water-resistive barrier*.

Exceptions:

1. Walls in which the *water-resistive barrier* is the only combustible component and the *exterior wall* has a wall covering of brick, concrete, stone, terra cotta, stucco or steel with minimum thicknesses in accordance with Table 1404.2.
2. Walls in which the *water-resistive barrier* is the only combustible component and the *water-resistive barrier* has a peak heat release rate of less than 150 kW/m^2, a total heat release of less than 20 MJ/m^2 and an effective heat of combustion of less than 18 MJ/kg as determined in accordance with ASTM E1354 and has a flame spread index of 25 or less and a smoke-developed index of 450 or less as determined in accordance with ASTM E84 or UL 723. The ASTM E1354 test shall be conducted on specimens at the thickness intended for use, in the horizontal orientation and at an incident radiant heat flux of 50 kW/m^2.

1406.10.4 Full-scale tests. The MCM system shall be tested in accordance with ~~, and comply with, the acceptance criteria of NFPA 285~~Section 1410. Such testing shall be performed on the MCM system with the MCM in the maximum thickness intended for use.

1408.10.4 Full-scale tests. The HPL system shall be tested in accordance with ~~, and comply with, the acceptance criteria of NFPA 285~~Section 1410. Such testing shall be performed on the HPL system with the HPL in the minimum and

maximum thicknesses intended for use.

[BG] 1510.6.2 Type I, II, III or IV construction. Regardless of the requirements in Section 1510.6, *mechanical equipment screens* that are located on the roof decks of buildings of Type I, II, III or IV construction shall be permitted to be constructed of combustible materials in accordance with any one of the following limitations:

1. The fire separation distance shall be not less than 20 feet (6096 mm) and the height of the mechanical equipment screen above the roof deck shall not exceed 4 feet (1219 mm) as measured to the highest point on the *mechanical equipment screen*.
2. The fire separation distance shall be not less than 20 feet (6096 mm) and the *mechanical equipment screen* shall be constructed of fire-retardant-treated wood complying with Section 2303.2 for exterior installation.
3. Where exterior wall covering panels are used, the panels shall have a flame spread index of 25 or less when tested in the minimum and maximum thicknesses intended for use, with each face tested independently in accordance with ASTM E84 or UL 723. The panels shall be tested in the minimum and maximum thicknesses intended for use in accordance with ~~,~~ Section 1410 and shall ~~comply with the acceptance criteria of, NFPA 285 and shall~~ be installed as tested. Where the panels are tested as part of an exterior wall assembly in accordance with ~~NFPA 285~~Section 1410, the panels shall be installed on the face of the *mechanical equipment screen* supporting structure in the same manner as they were installed on the tested exterior wall assembly.

2603.5.5 Vertical and lateral fire propagation. The exterior wall assembly shall be tested in accordance with ~~and comply with the acceptance criteria of NFPA 285~~Section 1410.

Exceptions:

1. One-story buildings complying with Section 2603.4.1.4.
2. Wall assemblies where the foam plastic insulation is covered on each face by not less than 1-inch (25 mm) thickness of masonry or concrete and meeting one of the following:

   2.1. There is no airspace between the insulation and the concrete or masonry.
   2.2. The insulation has a flame spread index of not more than 25 as determined in accordance with ASTM E84 or UL 723 and the maximum airspace between the insulation and the concrete or masonry is not more than 1 inch (25 mm).

Commenter's Reason: At the committee hearing, there was broad support for the idea of limiting application of NFPA 285 test results to installations that are consistent with what is actually tested. NFPA 285 ONLY tests flat, vertical wall assemblies (see first photo below for an illustration of the test setup and fire exposure). It does not evaluate the ability of assemblies to survive increased fire exposure (heat flux) caused by inside corners; it does not evaluate the risk of fire penetration into wall assemblies at intersections with horizontal overhangs; and it does not evaluate the ability of horizontally installed assemblies to resist fire penetration (conditions such as those shown in the third photo below). Even without those variables, the fire exposure used in the test is questionably inadequate to judge performance in a realistic fire exposure (such as the one shown in the second photo below, which was taken during the American Wood Council's recent demonstrations of new Type IV construction methods). But with the added variables, which will certainly increase the exposure and risk of assembly failure, it is clearly inappropriate to allow NFPA 285 assemblies to be applied carte blanche under the IBC without further consideration of the fire risk.
Objections to the original proposal primarily focused on the difficulty of determining suitable prescriptive code-based modifications to a referenced fire test method. This public comment resolves that concern by limiting application of the NFPA 285 test method to what is tested and requiring that any other application of the test results be dealt with as an alternative method of compliance because it would involve using the test method beyond its historic scope limitations and the test setup.

The scope of NFPA 285 currently states:

This standard provides a test method for determining the fire propagation characteristics of exterior non-load-bearing wall assemblies and panels used as components of curtain wall assemblies, that are constructed using combustible materials or that incorporate combustible components, and that are intended to be installed on buildings required to have exterior walls of noncombustible construction.

Ignoring the aforementioned concerns and the fact that the current test method has not been publicly vetted for expanded applications, issues raised multiple times during the current NFPA 285 development cycle, the NFPA 285 Technical Committee recently acted without legitimate justification to remove the scope restrictions that limit the test method to non-bearing assemblies. They also expanded applications to include combustible structures, such as mass

timber high-rise buildings, in the next edition. That increases the possibility for an exterior wall fire to directly involve structural elements of a combustible high-rise building outside of the sprinklered envelope and above the height limit of fire department master streams.

The intent of this public comment is assuring that any application of the NFPA 285 test that goes beyond the standardized test method or what is actually tested must be treated as an alternative method of compliance (not unlike the approach approved by the Fire Safety Code Development Committee for Proposal FS1-2018). This will assure that the code official will have input into the process of determining whether the NFPA 285 test results are being appropriately applied, based on the recommendation and analysis of a recognized design professional, and whether additional testing or analysis may be necessary to gain approval. Like all alternative method proposals, each instance will require individual analysis, and the same solution may not be appropriate in all cases.

Given recent major fires involving exterior wall fire propagation, and particularly the Grenfell incident, it is unconscionable to not have the next edition of the IBC establish a reasonable limit on the use of NFPA 285 test results equating to conditions that are actually tested. This is especially important given the irresponsible action of the NFPA 285 committee to propose a scope expansion without first reviewing and reconsidering the suitability of the current test parameters for real-life applications, especially those involving combustible structures. Although catastrophic fires to date have not been documented as NFPA 285 examples, that certainly does not equate to a conclusion that such fires could not occur. Case-in-point, where are the fire incidents demonstrating NFPA 285 successes?

In conclusion, when NFPA 285 tested assemblies are installed outside of the tested configuration, the performance of the tested assembly is currently entirely unknown. Therefore, the supplemental analysis and code official approval required by this public comment is appropriate to ensure that the potential dangers to the public and to firefighters will not be overlooked or ignored.

NOTE: Other than the addition of Section 1410, the remaining portions of this public comment simply change the reference pointers from NFPA 285 to the new Section 1410. The revision shown for Section 1402.5 is NOT intended to override the outcome on Proposal FS99-18. The only Section 1402.5 change to be made by this public comment is revising the NFPA 285 reference that ends up in this section so that it points to the new Section 1410.

This public comment is also submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire safety and hazardous materials in new and existing buildings and facilities and the protection of life and property in wildland urban interface areas. In 2017 the Fire-CAC has held 3 open meetings and in 2018 FCAC held 2 open meetings. In addition, there were numerous conference calls, Regional Work Group and Task Group meetings for the current code development cycle, which included members of the committees as well as any interested parties, to discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: https://www.iccsafe.org/codes-tech-support/cs/fire-code-action-committee-fcac/

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
Currently, NFPA 285 s scope is limited to not include all types of wall assemblies that are being addressed by this proposal. Compliance with additional technical analysis as proposed may have an impact on the cost of construction as it may require additional tests.

Public Comment 3:

Proponent: Jesse Beitel, Jensen Hughes representing XPSA, representing Extruded Polystyrene Foam Association (jbeitel@haifire.com); Jay Crandell (jcrandell@aresconsulting.biz); Richard Justin Koscher (jkoscher@pima.org)requests Disapprove.

Commenter's Reason: Please uphold the unanimous ICC Fire Safety Code Committee action for disapproval. The proposal intended to add modifications in the NFPA 285 test method such as changes in test wall configuration(s) and requirements for the application of a wind exposure to the test wall.

The Committee, unanimously voted disapproval of this proposal due to questions concerning how proposed test details would be performed, their impact on performance of the test and the capability of the test laboratories to carry out the proposed test modifications in a manner that would ensure reproducible and repeatable test results.

The use of a wind exposure has many potential problem. In fact, the NFPA 285 test was developed so that the test can be conducted indoors and eliminate the non-reproducibility caused by winds during the outdoor two-story building test (UBC26-4).

The proposed change to add a corner configuration or add other wall features, presents some of the same issues with respect to how to build these features, how does this change the test and does other items such as instrumentation, pass/fail criteria, etc. need to be changed as well.

Additionally, any changes to the applicability of the test standard or its scope will change the use of the standard and because significant issues with respect to previously tested assemblies and how new assemblies are to be tested.

These types of changes are significant and must be properly vetted and discussed by the Committee responsible for the test standard and go through the standard revision process so it will meet the requirements for use in ICC Codes Additionally it is imperative to have exploratory, reproducibilry and repeatability testing performed (as was done with the current NFPA 285) before the changes are incorporated into the test method.

The NFPA 285 is under the purview of the NFPA Technical Committee on Fire Tests. The Committee in June, 2018 discussed these potential changes as well as others to the scope of the standard and determined that they would be discussed in the next revision cycle of NFPA 285. Currently, there is no data to demonstrate the need for these changes, no data to show it effect of these changes on tested wall assemblies etc. Thus, it was not possible to include these items in the test method at this point in time.

Finally, NFPA 285 is an excellent test to determine vertical and horizontal flame-spread on or with exterior walls. The actual real world fires that have involved NFPA complying wall assemblies', the wall assemblies have performed as predicted by the NFPA 285 test.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
None

FS99-18

FS103-18

IBC: 1402.5

Proposed Change as Submitted

Proponent: Thomas Meyers, Building Intuition, LLC, representing Self (codeconsultant@gmail.com)

2018 International Building Code

Revise as follows

1402.5 Vertical and lateral flame propagation. *Exterior walls* on buildings of Type I, II, III or IV construction that are greater than 40 feet (12 192 mm) in height above grade plane and contain a combustible *water-resistive barrier* shall be tested in accordance with and comply with the acceptance criteria of NFPA 285. For the purposes of this section, *fenestration* products, flashing of *fenestration* products and *water-resistive-barrier* flashing and accessories at other locations, including through wall flashings, shall not be considered part of the *water-resistive barrier*.

Exceptions:

1. Walls in which the *water-resistive barrier* is the only combustible component and the *exterior wall* has a wall covering of brick, concrete, stone, terra cotta, stucco or steel with minimum thicknesses in accordance with Table 1404.2.
2. Walls in which the *water-resistive barrier* is the only combustible component and the *water-resistive barrier* has a peak heat release rate of less than 150 kW/m^2, a total heat release of less than 20 MJ/m^2 and an effective heat of combustion of less than 18 MJ/kg as determined in accordance with ASTM E1354 and has a flame spread index of 25 or less and a smoke-developed index of 450 or less as determined in accordance with ASTM E84 or UL 723. The ASTM E1354 test shall be conducted on specimens at the thickness intended for use, in the horizontal orientation and at an incident radiant heat flux of 50 kW/m^2.
3. Walls in which the water-resistive barrier is applied over pressure-impregnated, fire-retardant-treated-wood complying with Section 2303.2 and the water-resistive barrier complies with Exception 1 or Exception 2.

Reason: Recent building cladding fires, such as the Grenfell Tower fire in London, have prompted review of the application of the NFPA 285 test standard to identify potential existing conflicts and areas of needed improvement or clarification. Section 1402.5 appears to create a conflict resulting in significant industry confusion regarding the use of *fire-retardant-treated wood* (FRTW) in Types I, II, III, & IV construction as allowed by Section 602 and 603. This section suggests that FRTW cannot be used with a NFPA 285 compliant water-resistive barrier beyond 40 feet in height. The code currently allows FRTW used in Type III construction to extend to 85 feet in height. As FRTW does not meet the definition of "noncombustible" per Section 703.5, Exceptions 1 and 2 cannot be applied. This change provides for the needed clarification to permit FRTW to be used as permitted in Section 602 and 603 in conjunction with a NFPA 285 compliant water-resistive barrier.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Potential construction savings where FRTW use was denied due to existence of a combustible water-resistive barrier.

FS103-18

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The committee determined there was no technical justification to introduce fire retardant treated wood. (Vote 12-2)

Assembly Action: **None**

FS103-18

Individual Consideration Agenda

Public Comment 1:

Proponent: Thomas Meyers, Building Intuition, LLC, representing Self (codeconsultant@gmail.com)requests As Modified by This Public Comment.

Modify as follows:

2018 International Building Code

1402.5 Vertical and lateral flame propagation. *Exterior walls* on buildings of Type I, II, III or IV construction that are greater than 40 feet (12 192 mm) in height above grade plane and contain a combustible *water-resistive barrier* shall be tested in accordance with and comply with the acceptance criteria of NFPA 285. For the purposes of this section, *fenestration* products, flashing of *fenestration* products and *water-resistive-barrier* flashing and accessories at other locations, including through wall flashings, shall not be considered part of the *water-resistive barrier*.

Exceptions:

1. Walls in which the *water-resistive barrier* is the only combustible component and the *exterior wall* has a wall covering of brick, concrete, stone, terra cotta, stucco or steel with minimum thicknesses in accordance with Table 1404.2.
2. Walls in which the *water-resistive barrier* is the only combustible component and the *water-resistive barrier* has a peak heat release rate of less than 150 kW/m^2, a total heat release of less than 20 MJ/m^2 and an effective heat of combustion of less than 18 MJ/kg as determined in accordance with ASTM E1354 and has a flame spread index of 25 or less and a smoke-developed index of 450 or less as determined in accordance with ASTM E84 or UL 723. The ASTM E1354 test shall be conducted on specimens at the thickness intended for use, in the horizontal orientation and at an incident radiant heat flux of 50 kW/m^2.
3. Walls in which the water-resistive barrier is applied over ~~pressure-impregnated,~~ fire-retardant-treated-wood complying with Section 2303.2 and the water-resistive barrier complies with Exception 1 or Exception 2.

Commenter's Reason: This section specifically addresses the use of water resistive barriers on buildings of Type I, II, III, and IV construction. During testimony on this item, the following issues were raised:
1. The proposed exception's limitation to only pressure preservative fire retardant materials is too restrictive. This public comment removes that restriction.

2. There is no technical justification for the change. Testimony was provided showing that at least one fire retardant treated wood manufacturer has multiple assemblies that pass this standard using combustible insulative and water resistive materials within the assembly. Unfortunately, most of the testimony focused on the NFPA 285 and considerable disagreement on its validity for testing certain materials and assemblies used on building exteriors. Regardless, this is the test standard that was approved in a previous code cycle and compliance is required until either the standard is revised or until a new standard is proposed as a replacement.

Meanwhile, Type III buildings are being constructed across the United States using a combination of fire retardant treated wood in conjunction with thin water resistive barriers. This code section has caused considerable problems in approvals processes as projects are stalled and subject to engineering judgments and other "alternates" justifications to carry on construction that has otherwise been safely demonstrated for decades.

Approval of the public comment will allow the continued successful practice of using combustible water resistive barriers in conjunction with fire retardant treated wood.

Cost Impact: The net effect of the public comment and code change proposal will decrease the cost of construction The current confusion caused by this code section has added performance documentation costs for project approvals.

Staff Analysis: If approved, these changes would be applied to the section as approved by FS98.

FS103-18

FS104-18

IBC: 1402.5

Proposed Change as Submitted

Proponent: Ali Fattah, City of San Diego, representing City of San Diego (afattah@sandiego.gov)

2018 International Building Code

Revise as follows

1402.5 Vertical and lateral flame propagation. *Exterior walls* on buildings of Type I, II, III or IV construction that are greater than 40 feet (12 192 mm) in height above grade plane and contain a combustible *water-resistive barrier* shall be tested in accordance with and comply with the acceptance criteria of NFPA 285. For the purposes of this section, *fenestration* products, flashing of *fenestration* products and *water-resistive-barrier* flashing and accessories at other locations, including through wall flashings, shall not be considered part of the *water-resistive barrier*.

Exceptions:

1. Walls in which the *water-resistive barrier* is the only combustible component and the *exterior wall* has a wall covering of brick, concrete, stone, terra cotta, stucco or steel with minimum thicknesses in accordance with Table 1404.2.
2. Walls in which the *water-resistive barrier* is the only combustible component and the *water-resistive barrier* has a peak heat release rate of less than 150 kW/m^2, a total heat release of less than 20 MJ/m^2 and an effective heat of combustion of less than 18 MJ/kg as determined in accordance with ASTM E1354 and has a flame spread index of 25 or less and a smoke-developed index of 450 or less as determined in accordance with ASTM E84 or UL 723. The ASTM E1354 test shall be conducted on specimens at the thickness intended for use, in the horizontal orientation and at an incident radiant heat flux of 50 kW/m^2.
3. Exterior walls on buildings of Type III construction in which the water-resistive barrier is installed directly on exterior gypsum sheathing and the exterior wall has a wall covering of adhered veneer or stucco applied directly to the water-resistive barrier.

Reason: The IBC requires that exterior walls incorporating combustible water-resistive barriers in buildings higher than 40 ft and constructed of Type I, I, III or IV construction be tested to NFPA 285. Grade building paper has not been tested, Type V buildings can have a height that exceeds 40 ft and are not addressed. All the wall assemblies listed do not incorporate wood studs. The proposed code change ensures that the ignition of the water resistive barrier will not be caused by ignition of the combustible sheathing such as OSB or plywood. Section 703.5.2 conceptually addresses this issue similarly to that where a thin material is laminated on a non-combustible material can be considered non-combustible if it meets a flame spread rating. Exception 1 in Section 1402.5 also recognizes the benefit of the combustible water resistive barrier in a non-combustible wall. Similarly this code change recognize that the ignition potential for a combustible water resistive barrier sandwiched between two non-combustible sheathing materials or plaster without flue space is very limited. While there may be drainage planes between the stucco and the water resistive barrier the flue space is small enough to be negligible.
We have received several alternate methods and materials requests to utilize Grad D paper in lieu of listed proprietary water resistive barriers since the generic legacy material has not been tested ad all the listed wall assemblies are listed on metal framing. We have also reviewed fire analysis of heat release rates, time to ignition and various other parameters comparing the legacy material to the proprietary materials and they appear to have comparable properties and as a result chose to not include Type V buildings permitted to have a height in excess of 40 ft to this code change.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposed code change provides an option that does not require the use of proprietary water resistive barriers.

FS104-18

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The committee concluded the proposal did not contribute to improved fire safety, it did not clarify the properties of first resistant barriers, nor did it define adhered veneer. (Vote 13-1).

Assembly Action: **None**

FS104-18

Individual Consideration Agenda

Public Comment 1:

Proponent: Ali Fattah, City of San Diego, representing San Diego Area Chapter of ICCrequests As Modified by This Public Comment.

Further modify as follows:

2018 International Building Code

1402.5 Vertical and lateral flame propagation. *Exterior walls* on buildings of Type I, II, III or IV construction that are greater than 40 feet (12 192 mm) in height above grade plane and contain a combustible *water-resistive barrier* shall be tested in accordance with and comply with the acceptance criteria of NFPA 285. For the purposes of this section, *fenestration* products, flashing of *fenestration* products and *water-resistive-barrier* flashing and accessories at other locations, including through wall flashings, shall not be considered part of the *water-resistive barrier*.

Exceptions:

1. Walls in which the *water-resistive barrier* is the only combustible component and the *exterior wall* has a wall covering of brick, concrete, stone, terra cotta, stucco or steel with minimum thicknesses in accordance with Table 1404.2.
2. Walls in which the *water-resistive barrier* is the only combustible component and the *water-resistive barrier* has a peak heat release rate of less than 150 kW/m^2, a total heat release of less than 20 MJ/m^2 and an effective heat of combustion of less than 18 MJ/kg as determined in accordance with ASTM E1354 and has a flame spread index of 25 or less and a smoke-developed index of 450 or less as determined in accordance with ASTM E84 or UL 723. The ASTM E1354 test shall be conducted on specimens at the thickness intended for use, in the horizontal orientation and at an incident radiant heat flux of 50 kW/m^2.
3. Exterior walls on buildings of Type III construction in which the water-resistive barrier is installed directly on exterior gypsum sheathing and the exterior wall has a wall covering of adhered veneer or stucco applied directly to the water-resistive barrier. The *water-resistive barrier* shall have a peak heat release rate of less than 150 kW/m^2, a total heat release of less than 20 MJ/m^2 and an effective heat of combustion of less than 18 MJ/kg as determined in accordance with ASTM E1354 and a flame spread index of 25 or less and a smoke-developed index of 450 or less as determined in accordance with ASTM E84 or UL 723. The ASTM E1354 test shall be conducted on specimens at the thickness intended for use, in the horizontal orientation and at an incident radiant heat flux of 50 kW/m^2.

Commenter's Reason: This public comment has been submitted been submitted in response to feedback from the committee and speakers that spoke in opposition to the proposal. Persons in opposition were supposed of the concept where exterior walls utilizing wood framing is addressed in the exceptions. Code requirements that can not be enforced, whether because the requirements conflict with a referenced standard, or whether tested assemblies do not exist to implement a code requirement are not enforced.
When combustible water resistive barriers were first regulated in chapter 14 the main impetus was due observations made when testing wall assemblies utilizing claddings and foam plastic insulation. Cladding systems typically include void spaces that create a flue effect up behind the cladding that allows fire to spread vertically within the way assembly. At the time of the original code change conventional methods typical for installation of stucco used as an exterior wall covering were not evaluated nor were exterior wall assemblies incorporating wood. Only proprietary materials incorporating plastics have been tested and they are popular in exterior wall assemblies including claddings such as siding products, MCM, stone veneers, etc. have been tested to demonstrate compliance with IBC Section 1402.5 and the assembly listings list them for use in metal framed exterior walls.

Type V construction is excluded due the height limit imposed on the type of construction and since the entire exterior wall assembly is permitted to be combustible. Missed in the code requirement when Section 1402.5 were first developed is the reality that:

> The height Type V construction can be extended up to 60 feet; and
> That Type III construction when incorporating fire retardant treated wood (FRTW) within the exterior wall is original. While incorporating better protected exterior load bearing walls and FRTW Type III construction is still combustible.

A further complication is the fact that as presently written NFPA 285 requires testing of cladding assembles attached to non-combustible framing presumably to verify the behavior of the cladding alone knowing that the exterior wall assembly might fail the test sooner.

During testimony a misunderstanding of Type III construction was evident. The construction is limited to a height of up to 85 ft and that the exterior wall covering is always required to be non-combustible. Furthermore the WRB is not the only combustible element so exception 1 to Section 1402.5 can not apply to Type III construction. We also learned from the testimony that exception # 1 ad 2 were developed based on observations in testing and that justification was not provided in the code change as initially proposed to effectively extend the applicability of exception 1 to Type III construction.

We have become aware of listing agencies, and agencies producing research reports, that evaluate exterior wall assemblies incorporating WRB for conformance with IBC Section 1402.5 have begun to recognize comparisons of WRB not tested in a particular assembly in listing wall assemblies that have not been tested to NFPA 285. Furthermore, these agencies are producing engineering judgements addressing the use of wood framing in wall assemblies that have been tested with non-combustible framing. That was the spirit of the original code change where we sought to justify the omission of testing in cases where both interior and exterior exposure to the WRB are eliminated and thus the possibility of ignition diminished. Furthermore, the original code change also recognized the limited ability for fire to spread within the wall assembly de a lack of flue space in stucco assemblies for example.

The public comment recognizes that there should be a limit to the combustibility of the WRB so proposed exception # 3 incorporates the limitations in exception 2.

We hope that the membership of ICC will help jurisdictions in the southwest better enforce Chapter 14 of the IBC and allow the use of combustible WRB materials in combustible wall assemblies and assemblies that incorporate WRB materials such as Grade D paper that comply with the flammability limits of exception 2.

Cost Impact: The net effect of the public comment and code change proposal will decrease the cost of construction The code change will reduce the need for costly full exterior wall assemblies or the ned for engineering judgement and the processing of Code Modifications or Alternate Methods and Materials applications all of which require additional processing costs.

FS104-18

FS108-18

IBC: 1403.2

Proposed Change as Submitted

Proponent: Joseph Lstiburek, representing Self (joe@buildingscience.com)

2018 International Building Code

Revise as follows

1403.2 Water-resistive barrier. Not fewer than one layer of No.15 asphalt felt, complying with ASTM D226 for Type 1 felt or other *approved* materials with a water resistance complying with ASTM E2556, Type I, shall be attached to the studs or sheathing, with flashing as described in Section 1404.4, in such a manner as to provide a continuous *water-resistive barrier* behind the *exterior wall* veneer.

Reason:
The existing code language gives insufficient guidance for other approved materials. The added language addresses this issue and provides a specific performance requirement for water resistance and provides consistency with other sections of the code that relate specifically to water-resistive barriers.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This change gives better guidiance for water resistance.

FS108-18

Public Hearing Results

Committee Action: As Modified

Committee Modification: 1403.2 Water-resistive barrier.
Not fewer than one layer of water-resistive barrier material ~~No.15 asphalt felt, complying with ASTM D226 for Type 1 felt or other approved materials with a water resistance complying with ASTM E2556, Type I,~~ shall be attached to the studs or sheathing, with flashing as described in Section 1404.4, in such a manner as to provide a continuous water-resistive barrier behind the exterior wall veneer. Water-resistive barriers shall comply with one of the following:

(1) No. 15 felt complying with ASTM D226, Type 1,

(2) ASTM E2556, Type I or II,

(3) ASTM E331 in accordance with Section 1402.2, or

(4) other approved materials installed in accordance with the manufacturer's installation instructions.

Committee Reason: The committee determined the proposal clarifies the intent of the section, the modification addresses all material types, allows for innovation, and is consistent with appropriate standard references. (Vote 14-0)

Assembly Action: None

FS108-18

Individual Consideration Agenda

Public Comment 1:

Proponent: Richard Popp, Meyer Concrete Pumping & Conveyor Service, LLC., representing Meyer Concrete Pumping & Conveyor Service, LLC.requests Disapprove.

Commenter's Reason: Allowing wood structures to be built above the level of fire department access is a serious mistake. Wood does not offer the resilience and fire protection of non-combustible alternatives like concrete and steel. Cross-Laminated Timber chars in a fire; however, charring is not equivalent to noncombustible. Note: if the char rate is 1” per hour in a fire, then after 2 hours in a fire, a 6” thick CLT wood load bearing wall will only have 2” of structural material left. This is not acceptable and is not addressed in the code change proposals. Should you pass this, you are putting countless lives and making an even larger impact on the generations to come as the world's forests are being depleted. Be smart about this and do not pass this.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
The code change will not increase or decrease the cost of construction

FS108-18

FS110-18

IBC: 1403.8

Proposed Change as Submitted

Proponent: Michael O'Brian, Chair, representing FCAC (FCAC@iccsafe.org)

2018 International Building Code

Revise as follows

1403.8 ~~Plastics.~~Plastic construction elements. Plastic ~~panel, apron or spandrel walls as defined in this code~~ construction elements of the exterior wall envelope, including aprons, panels and spandrels shall not be limited in thickness, provided that such plastics and their assemblies conform to the applicable requirements of Chapter 26 and are constructed of *approved* weather-resistant materials of adequate strength to resist the wind loads for cladding specified in Chapter 16. Plastic spandrel walls shall also comply with the applicable requirements of section 715.5. Light transmitting plastic wall panels shall comply with Section 2607.

Reason: This code change proposal is intended to clarify the requirements for plastic construction elements in exterior walls. This section is confusing as currently written.
Section 1404.8 does not address plastics in general, but does contain some requirements for specific plastic construction elements on exterior walls. The following terms are not defined in the IBC code: plastic panels, plastic aprons and plastic spandrel walls. The only reference to spandrel walls (and not specifically to plastic spandrel walls) is in section 715.5. Plastic panels are not mentioned in the code, except for light transmitting plastic wall panels that are referenced in section 2607.

In view of the fact that the section as written is confusing, this proposal will serve to clarify the requirements for better understanding by designers and building code officials, without changing requirements.

This proposal is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire safety and hazardous materials in new and existing buildings and facilities and the protection of life and property in wildland urban interface areas. In 2017 the Fire-CAC has held 3 open meetings. In addition, there were numerous conference calls, Regional Work Group and Task Group meetings for the current code development cycle, which included members of the committees as well as any interested parties, to discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: https://www.iccsafe.org/codes-tech-support/cs/fire-code-action-committee-fcac/

This proposal is one in a series of related proposals intended to address different technical changes to Chapter 14. While the Fire Code Committee will consider each proposal independently, the intent is for approval of all proposals in this package which have been submitted as a correlated set of companion code change proposals.

The FCAC analyzed several fatal fires related to exterior façade/curtain wall fires in the development of these new code requirements. The intent of these proposals is to provide a reasonable set of code requirements to ensure fire safety and weather protection for buildings that utilize combustible materials and/or assemblies for the building exterior wall envelope.

1. Grenfell fire, London England:

Buildings Across U.S. Are Wrapped in Same Panels That Fueled Deadly London Fire: https://www.wsj.com/articles/built-to-burn-thousands-of-buildings-world-wide-are-wrapped-in-combustible-panels-1508858048

Why Grenfell Tower Burned: Regulators Put Cost Before Safety
https://www.nytimes.com/2017/06/24/world/europe/grenfell-tower-london-fire.html

2. Torch Tower Fire, Dubai

https://en.wikipedia.org/wiki/The_Marina_Torch January 8th, 2018

3. Address Hotel Fire, Dubai https://en.wikipedia.org/wiki/The_Address_Downtown_Dubai January 8th, 2018

Bibliography:

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

This proposal simply clarifies the section for better use and understanding.

FS110-18

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The committee concluded the existing language was clear without this change, and this broadened the scope of with regards to plastics. (Vote 14-0).

Assembly Action: **None**

FS110-18

Individual Consideration Agenda

Public Comment 1:

Proponent: Michael O'Brian, FCAC, representing FCAC (fcac@iccsafe.org)requests As Modified by This Public Comment.

Further modify as follows:

2018 International Building Code

1403.8 Plastic ~~construction elements~~panels, aprons or spandrel walls. Plastic ~~construction elements of the exterior wall envelope, including aprons, panels and spandrels~~ panels, aprons and spandrel walls shall not be limited in thickness, provided that such plastics and their assemblies conform to the applicable requirements of Chapter 26 and are constructed of *approved* weather-resistant materials of adequate strength to resist the wind loads for cladding specified in Chapter 16. Plastic spandrel walls shall also comply with the applicable requirements of section 715.5. Light transmitting plastic wall panels shall comply with Section 2607.

Commenter's Reason: This public comment is simply to delete confusing and incorrect language. This public comment addressed the other reasons the IBC-FS Committee voted for Disapproval by removing other language presented in the original proposal.
The terms plastic panels, plastic aprons and plastic spandrel walls are not defined in the IBC, so this proposal deletes the confusing language that states the terms are defined.

The IBC typically does not use language “as defined in this code”.

This public comment is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire safety and hazardous materials in new and existing buildings and facilities and the protection of life and property in wildland urban interface areas. In 2017 the Fire-CAC has held 3 open meetings and in 2018 FCAC held 2 open meetings. In addition, there were numerous conference calls, Regional Work Group and Task Group meetings for the current code development cycle, which included members of the committees as well as any interested parties, to discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at:
https://www.iccsafe.org/codes-tech-support/cs/fire-code-action-committee-fcac/

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This proposal simply clarifies the section for better use and understanding.

FS110-18

FS111-18

IBC: 1403.12

Proposed Change as Submitted

Proponent: Michael O'Brian, Chair, representing FCAC (FCAC@iccsafe.org)

2018 International Building Code

Revise as follows

1403.12 Polypropylene siding. *Polypropylene siding* shall be certified and labeled as conforming to the requirements of ASTM D7254 and those of Section 1403.12.1 or 1403.12.2 by an approved quality control agency. *Polypropylene siding* shall be limited to buildings of Type VB construction and shall be installed in accordance with the requirements of Section 1404.18 and ~~in accordance with~~ the manufacturer's instructions. *Polypropylene siding* shall be secured to the building so as to provide weather protection for the *exterior walls* of the building.

Reason: This proposal limits the use of Polypropylene siding to only buildings of Type VB construction and adds back language that was inadvertently removed during the last code cycle.
Polypropylene siding is permitted in the code by section 1403.12, which requires it to meet ASTM D7254. The fire test in ASTM D7254 is ASTM E84 and polypropylene siding typically materials melt and fall to the floor of the tunnel during the test before the flame reaches the test specimen, which means that the flame spread index determined is not a valid test result.

Polypropylene siding is a product with very poor fire performance, something that has been demonstrated time after time. For example, the heat release rate of the polypropylene material typically used for polypropylene siding is about twice as high as that of typical wood siding and over twice as high as that of vinyl siding. The heat released by a material used in the outside of a building is an indication of the radiated heat to a nearby building.

Siding tests using ASTM E1354 fire test:

Wood (cedar) siding: peak heat release rate 309 kW/m - effective heat of combustion: 13 MJ/kg

Polypropylene siding 1: peak heat release rate 546 kW/m - effective heat of combustion: 25 MJ/kg

Polypropylene siding 2: peak heat release rate 878 kW/m - effective heat of combustion: 32 MJ/kg

Material tests using ASTM E1354 fire test:

Vinyl (PVC): peak heat release rate 190 kW/m - effective heat of combustion: 9 MJ/kg

For that reason, the use of this material has been limited to Type VB construction since it was first allowed into the IBC. When polypropylene siding burns it releases much more heat than any other siding material permitted by the code.

The difference between Type VB construction and no limits on the Type of construction, allows construction with greater heights, more stories above grade plane and larger allowable areas as well as allowing in buildings of Types I through IV construction. The text proposed to be added by this proposal was deleted at the last cycle with the rationale that this section simply addresses wind speeds. However, the permission for using polypropylene siding in any type of construction applies to the entire chapter.

Note also that the fire separation distance for polypropylene siding is 10 feet (as opposed to 5 feet for other materials) due to its poorer fire performance.

This proposal is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire safety and hazardous materials in new and existing buildings and facilities and the protection of life and property in wildland urban interface areas. In 2017 the Fire-CAC has held 3 open meetings. In addition, there were numerous conference calls, Regional Work Group and Task Group meetings for the current code development cycle, which included members of the committees as well as any interested parties, to discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: https://www.iccsafe.org/codes-tech-support/cs/fire-code-action-committee-fcac/

This proposal is one in a series of related proposals intended to address different technical changes to Chapter 14. While the Fire Code Committee will consider each proposal independently, the intent is for approval of all proposals in this package which have been submitted as a correlated set of companion code change proposals.

The FCAC analyzed several fatal fires related to exterior façade/curtain wall fires in the development of these new code requirements. The intent of these proposals is to provide a reasonable set of code requirements to ensure fire safety and weather protection for buildings that utilize combustible materials and/or assemblies for the building exterior wall envelope.

1. Grenfell fire, London England:

Buildings Across U.S. Are Wrapped in Same Panels That Fueled Deadly London Fire: https://www.wsj.com/articles/built-to-burn-thousands-of-buildings-world-wide-are-wrapped-in-combustible-panels-1508858048

Why Grenfell Tower Burned: Regulators Put Cost Before Safety
https://www.nytimes.com/2017/06/24/world/europe/grenfell-tower-london-fire.html

2. Torch Tower Fire, Dubai

https://en.wikipedia.org/wiki/The_Marina_Torch January 8th, 2018

3. Address Hotel Fire, Dubai https://en.wikipedia.org/wiki/The_Address_Downtown_Dubai January 8th, 2018

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal corrects the removal of the limitation to Type VB buildings that was inadvertently removed from the code the last cycle.

FS111-18

Public Hearing Results

Committee Action: **Disapproved**

Committee Reason: The committee indicated cladding is already addressed in Section 1405, and there is no data that it would be safe in Type V construction. The currently language has been vetted and was overwhelmingly approved in the last code change cycle. (Vote 10-4)

Assembly Action: **None**

FS111-18

Individual Consideration Agenda

Public Comment 1:

Proponent: Marcelo Hirschler, representing GBH International (mmh@gbhint.com)requests As Submitted.

Commenter's Reason: Committee statement: The committee indicated cladding is already addressed in Section 1405, and there is no data that it would be safe in Type V construction. The currently language has been vetted and was overwhelmingly approved in the last code change cycle. (Vote 10-4)
Three items are of interest there:

(1) Section 1405 applies only to buildings of Types I through IV construction.

(2) The committee stated that they had no information that PP siding was safe in type V construction. This is exactly what the proposal seeks to address. Restricting PP siding to Type VB will address the committee's concerns about the safety of this material. That is the reason that PP siding was restricted to Type VB construction when introduced in the IBC in the first place.

(3) The current language was vetted by the structural committee and not by the fire safety committee, which clearly had some significant reservations (note the multiple opponents to the action). The original restriction to Type VB construction was located in the section on wind requirements.

The proposed change was intended to place the restriction on PP siding application where it belongs, in a section dealing with fire safety.

Note that ASTM D7254 (which is what PP siding needs to conform to) requires testing of polypropylene to ASTM E84 (Steiner tunnel) and section 803.9 of the IBC does not allow polypropylene interior finish to be tested in accordance with ASTM E84. Thus means that polypropylene siding (meeting the requirements of ASTM D7254) would not be allowed as an interior finish material because the fire test is inappropriate for it.

In summary: a material that is known to exhibit very poor fire performance is being permitted in any type of construction based on a fire test requirement that is inappropriate (as evidenced by the prohibition to its use in a different section of the code) and based on the fact that a manufacturer showed a test result on a product for a section that applies to Types I-IV construction but not to Type V construction and with the background that the technical committee stated that its safety in Type V construction is not known.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This proposal corrects the removal of the limitation to Type VB buildings that was inadvertently removed from the code the last cycle.

FS111-18

FS149-18

IBC: 1406.10.4.1(New), 1408.10.4.1 (New), 2603.5.5.1 (New), Chapter 35

Proposed Change as Submitted

Proponent: John Harrington, FM Global, representing FM Global (john.harrington@fmglobal.com)

2018 International Building Code

1406.10.4 Full-scale tests. The MCM 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.

Add new text as follows

1406.10.4.1 Window protection. Where window openings are provided within the installed wall assembly, they shall be covered as follows:

1. Where the assembly was tested per NFPA 285,provide protection as provided in the actual test.
2. Where the assembly was tested per ANSI/FM 4880, provide minimum 20 ga. (0.03595 in, 0.9 mm) steel flashing around the window opening, fastened at a maximum spacing of 16 in. (406 mm) on center into the wall structure using no. 10 (5 mm) screws.

1408.10.4 Full-scale tests. The HPL system shall be tested in accordance with, and comply with, the acceptance criteria of NFPA 285. Such testing shall be performed on the HPL system with the HPL in the minimum and maximum thicknesses intended for use.

1408.10.4.1 Window Protection. Where window openings are provided within the installed wall assembly, they shall be covered as follows:

1. Where the assembly was tested per NFPA 285, provide protection as provided in the actual test.
2. Where the assembly was tested per ANSI/FM 4880, provide minimum 20 ga. (0.03595 in., 0.9 mm) steel flashing around the window opening, fastened at a maximum spacing of 16 inches. (406 mm) on center into the wall structure using minimum no. 10 (5 mm) screws.

2603.5.5 Vertical and lateral fire propagation. The exterior wall assembly shall be tested in accordance with and comply with the acceptance criteria of NFPA 285.

Exceptions:

1. One-story buildings complying with Section 2603.4.1.4.
2. Wall assemblies where the foam plastic insulation is covered on each face by not less than 1-inch (25 mm) thickness of masonry or concrete and meeting one of the following:

   2.1. There is no airspace between the insulation and the concrete or masonry.
   2.2. The insulation has a flame spread index of not more than 25 as determined in accordance with ASTM E84 or UL 723 and the maximum airspace between the insulation and the concrete or masonry is not more than 1 inch (25 mm).

2603.5.5.1 Window protection. Where window openings are provided within the installed wall assembly, they shall be covered as follows:

1. Where the assembly was tested per NFPA 285,provide protection as provided in the actual test.
2. Where the assembly was tested per ANSI/FM 4880, provide minimum 20 ga. (0.03595 in, 0.9 mm) steel flashing around the window opening, fastened at a maximum spacing of 16 in. (406 mm) on center into the wall structure using no. 10 (5 mm) screws.

Update standard(s) as follows

FM

FM Approvals
Headquarters Office 1151 Boston-
Providence Turnpike P.O. Box 9102
Norwood MA 02062

4880-~~2015~~2017:

Approval Standard for Class 1 Fire Rating of Building Panels or Interior Finish Materials

Reason: Protection against fire exposure to the wall assembly cross-section around window openings must be provided in the installation to prevent fire spread within the cavity of the wall assembly.

Cost Impact: The code change proposal will increase the cost of construction
Minimal cost increase for additional materials in walls so as to prevent fire spread within the wall cavity.

FS149-18

Public Hearing Results

Errata: Adding Section 1406.10.4.1 was part of the proponent's original submittal.
Add the following text

1406.10.4.1 Window protection.

Where window openings are provided within the installed wall assembly, they shall be covered as follows:

1.Where the assembly was tested per NFPA 285,provide protection as provided in the actual test.

2.Where the assembly was tested per ANSI/FM 4880, provide minimum 20 ga. (0.03595 in, 0.9 mm) steel flashing around the window opening, fastened at a maximum spacing of 16 in. (406 mm) on center into the wall structure using no. 10 (5 mm) screws.

Committee Action: Disapproved

Committee Reason: The committee disapproved based on the proponent's request, due to the disapproval of FS74. (Vote 13-0)

Assembly Action: None

FS149-18

Individual Consideration Agenda

Public Comment 1:

Proponent: John Harrington, representing FM Global (john.harrington@fmglobal.com)requests As Modified by This Public Comment.

Replace as follows:

2018 International Building Code

1406.10.4.1 Window protection Where window openings are provided within the installed wall assembly, they shall be covered as follows:

1. Where the assembly was tested per NFPA 285, provide protection as provided in the actual test.
2. Where the assembly was tested per ANSI/FM 4880, provide minimum 20 ga. (0.03595 in. 0.9 mm) steel flashing around the window opening, fastened at a maximum spacing of 16 inches (406 mm) on center into the wall structure using No. 10 (5 mm) screws.

1408.10.4.1 Window protection. Where window openings are provided within the installed wall assembly, they shall be covered as follows:

1. Where the assembly was tested per NFPA 285, provide protection as provided in the actual test.
2. Where the assembly was tested per ANSI/FM 4880, provide minimum 20 ga. (0.03595 in. 0.9 mm) steel flashing around the window opening, fastened at a maximum spacing of 16 inches (406 mm) on center into the wall structure using No. 10 (5 mm) screws.

Commenter's Reason: ANSI/FM 4880 is a consensus fire test that can be used to test fire exposure to the interior or exterior side of exterior walls. Justification for the ASNI/FM 4880 16 ft parallel panel; fire test has been included as part of the FS74 companion proposal. For the needed window protection accompanying the use of either NFPA 285 or ANSI/FM 4880, the windows must be designed prescriptively in accordance with 1406.10.4.1 or 1408.10.4.1. Protection against fire exposure to the wall assembly cross-section around window openings must be provided in the installation to prevent fire spread within the cavity of the wall assembly.

Cost Impact: The net effect of the public comment and code change proposal will increase the cost of construction Minimal cost increase for additional materials in walls so as to prevent fire spread within the wall cavity.

Public Comment 2:

Proponent: Justin Koscher, Polyisocyanurate Insulation Manufacturers Association (jkoscher@pima.org); John Woestman, Kellen Company, representing Extruded Polystyrene Foam Association (jwoestman@kellencompany.org);Jay Crandell, ARES Consulting, representing Foam Sheathing Committee of the American Chemistry Council (jcrandell@aresconsulting.biz)requests Disapprove.

Commenter's Reason: Please uphold the unanimous ICC Fire Safety Code Committee action for disapproval. This proposal is similar to proposal number FS74 also submitted by the same proponent. The same rationale for disapproval of FS74 applies here. In short, the proponent fails to provide sufficient supporting evidence and test data to establish that the FM 4880 16-foot Parallel Panel Test (FM 4880 16 PPT) is an equivalent and alternative method to the NFPA 285 test standard.

The proposal itself contains evidence that FM 4880 16 PPT is not equivalent to NFPA 285 because the consensus-version of the FM test standard does not require, or specify, a window opening in the tested assembly. The proponent attempts to correct this deficiency through this proposal. However, the ICC Council Policy No.28-05 (CP28) Section 3.6 Reference Standards relies on consensus standard setting organizations for such modifications. Therefore, the proposal should be rejected because it violates CP28 and attempts to reference a non-consensus version of a test standard.

Furthermore, in June 2018, the NFPA Standards Council approved the NFPA Fire Test Committee s request to establish a new project to evaluate the suitability of the FM 4880 16 PPT as an alternative to NFPA 285, subject to two conditions: (1) window openings or the lack thereof within the FM 4880 16 PPT will need to be addressed; and (2) whether the application of any new document will be mandated by the Codes. Given these developments, the NFPA Fire Test Committee should be allowed to complete its work before ICC voting members give further consideration to this concept. Therefore, the proposal should be disapproved.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
None.

FS149-18

FS155-18

IBC: 202, 2603.1.1, Chapter 35, ICC

Proposed Change as Submitted

Proponent: Brian Tollisen, representing ICC Foam Plastic Insulation Standard Committee (Brian.Tollisen@dos.ny.gov)

2018 International Building Code

Add new definition as follows

SPRAY-APPLIED FOAM PLASTIC. Single- and multi-component, spray-applied foam plastic insulation used in nonstructural applications which are installed at locations wherein the material is applied in a liquid or frothed state, permitted to free rise and cure in situ.

Add new text as follows

2603.1.1 Spray-applied foam plastic. Single- and multiple-component spray-applied foam plastic insulation shall comply with the provisions of Section 2603 and ICC 1100-2018.

Add new standard(s) follows

CHAPTER **35 REFERENCED STANDARDS**

ICC

International Code Council, Inc.
500 New Jersey Ave NW 6th Floor
Washington DC 20001

1100-2018:

Standard for Spray-applied Foam Plastic Insulation

Reason: The IBC contains requirements for thermal resistance of insulating materials but currently includes limited material standards for certain types of insulating materials. The purpose of this proposal is to introduce a performance standard for spray-applied foam plastic insulation. The standard establishes the minimum physical and performance properties as well as application requirements for spray-applied foam plastic insulations. This standard will benefit Code officials, spray-applied foam plastic insulation manufacturers, design professionals, product testing and certification agencies.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This proposal simply adds a material performance standard to the code that reflects the current industry and construction practices.

Analysis: A review of the standard proposed for inclusion in the code, ICC 1100-2018, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2018.

FS155-18

Public Hearing Results

Committee Action: **As Submitted**

Committee Reason: The committee approved the proposal based on proponent's reason statement. (Vote 13-0).

Assembly Action: **None**

FS155-18

Individual Consideration Agenda

Public Comment 1:

Proponent: CP28 Administration.

Commenter's Reason: The administration of ICC Council Policy 28 (CP28) is not taking a position on this code change. This public comment is being submitted to bring a procedural requirement to the attention of the ICC voting membership. In accordance with Section 3.6.3.1.1 of ICC Council Policy 28 (partially reproduced below), the new referenced standard ICC 1100-2018 must be completed and readily available prior to the Public Comment Hearing in order for this public comment to be considered.

(CP28) 3.6.3.1.1 Proposed New Standards. In order for a new standard to be considered for reference by the Code, such standard shall be submitted in at least a consensus draft form in accordance with Section 3.4. If the proposed new standard is not submitted in at least consensus draft form, the code change proposal shall be considered incomplete and shall not be processed. The code change proposal shall be considered at the Committee Action Hearing by the applicable code development committee responsible for the corresponding proposed changes to the code text. If the committee action at the Committee Action Hearing is either As Submitted or As Modified and the standard is not completed, the code change proposal shall automatically be placed on the Public Comment Agenda with the recommendation stating that in order for the public comment to be considered, the new standard shall be completed and readily available prior to the Public Comment Hearing

FS155-18
