IBC — Fire Safety

2018 GROUP A PROPOSED CHANGES TO THE I-CODES COLUMBUS COMMITTEE ACTION HEARINGS

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2018 GROUP A – PROPOSED CHANGES TO THE INTERNATIONAL BUILDING CODE – FIRE SAFETY

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TENTATIVE ORDER OF DISCUSSION
2018 PROPOSED CHANGES TO THE
INTERNATIONAL PROPERTY MAINTENANCE CODE

The following is the tentative order in which the proposed changes to the code will be discussed at the public hearings. Proposed changes which impact the same subject have been grouped to permit consideration in consecutive changes.

Proposed change numbers that are indented are those which are being heard out of numerical order. Indentation does not necessarily indicate that one change is related to another. Proposed changes may be grouped for purposes of discussion at the hearing at the discretion of the chair. Note that some FS code change proposals may not be included on this list, as they are being heard by another committee.

F4-18, Part II
G7-18
G12-18
FS1-18
FS2-18
FS3-18
FS4-18
FS7-18
FS8-18
FS9-18
FS10-18
FS11-18
FS12-18
FS13-18
FS14-18
FS15-18
FS16-18
FS17-18
FS18-18
FS19-18
FS20-18
FS21-18
FS22-18
FS23-18
FS24-18
FS25-18
FS26-18
FS27-18
FS28-18
FS29-18
FS30-18
FS31-18
FS32-18
FS33-18
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FS41-18
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FS44-18
FS45-18
FS46-18
FS47-18
FS48-18
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FS50-18
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FS52-18
FS53-18
FS54-18
FS55-18
FS56-18
FS57-18
FS58-18
FS59-18
FS60-18
FS61-18
G34-18
FS62-18
FS63-18
FS64-18
FS65-18
FS66-18
FS67-18
FS68-18
FS69-18
FS70-18
FS71-18
M72-18
FS72-18
FS74-18
FS75-18
FS76-18
FS77-18
FS78-18
FS79-18
FS80-18
F92-18 Part II
FS82-18
FS83-18
FS84-18
FS85-18
FS86-18
FS87-18
FS88-18
FS89-18
FS90-18
E97-18
FS91-18
FS92-18
FS93-18
FS94-18
FS95-18
FS96-18
FS97-18
FS98-18
FS99-18
FS100-18
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FS107-18
FS108-18
FS109-18
FS110-18
FS111-18
FS112-18
FS113-18
FS114-18
FS115-18
FS116-18
G6-18
FS117-18
FS118-18
FS119-18
FS120-18
FS121-18
FS122-18
FS123-18
FS124-18
FS125-18
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FS138-18
FS139-18
FS140-18
FS141-18
FS142-18
FS143-18
FS144-18
FS145-18
FS146-18
FS147-18
FS148-18

FS149-18
FS150-18
FS151-181
- S2-18
- S3-18
- S4-18

FS152-18
- S5-18
- S6-18
- S7-18
- S8-18
- S9-18

FS153-18
- G3-18
- S6-18

FS154-18
- S14-18
- S15-18
- S16-18
- S17-18
- S18-18
- S19-18
- S20-18
- S21-18
- G10-18
- G11-18

FS155-18
FS156-18
FS157-18
FS158-18
FS159-18
FS160-18
FS161-18

FS1-18

IBC: 703.2, 703.4

Proponent: Jeffrey Shapiro, representing Tyco Fire Products (jeff.shapiro@intlcodeconsultants.com)

2018 International Building Code

Revise as follows:

703.2 Fire-resistance ratings. The *fire-resistance rating* of building elements, components or assemblies shall be determined in accordance with the test procedures set forth in ASTM E119 or UL 263, without the use of automatic sprinklers or any other fire suppression system being incorporated as part of the test, or in accordance with Section 703.3. The *fire-resistance rating* of penetrations and *fire-resistant joint systems shall* be determined in accordance Sections 714 and 715, respectively.

703.3 Methods for determining fire resistance. The application of any of the methods listed in this section shall be based on the fire exposure and acceptance criteria specified in ASTM E119 or UL 263. The required *fire resistance* of a building element, component or assembly shall be permitted to be established by any of the following methods or procedures:

1. *Fire-resistance* designs documented in approved sources.
2. Prescriptive designs of fire-resistance-rated building elements, components or assemblies as prescribed in Section 721.
3. Calculations in accordance with Section 722.
4. Engineering analysis based on a comparison of building element, component or assemblies designs having *fire-resistance ratings* as determined by the test procedures set forth in ASTM E119 or UL 263.
5. Alternative protection methods as allowed by Section 104.11.
6. *Fire-resistance* designs certified by an approved agency.

Delete without substitution:

~~**703.4 Automatic sprinklers.** Under the prescriptive fire-resistance requirements of this code, the *fire-resistance rating* of a building element, component or assembly shall be established without the use of *automatic sprinklers* or any other fire-suppression system being incorporated as part of the assembly tested in accordance with the fire exposure, procedures and acceptance criteria specified in ASTM E119 or UL 263. However, this section shall not prohibit or limit the duties and powers of the *building official* allowed by Sections 104.10 and 104.11.~~

Reason:

This proposal captures discussion points from previous cycles and provides a simpler approach to dealing with limiting the E119 test protocol to not include fire suppression systems. Although E119 doesn't allow this, it is understood that some interest groups have wanted the point emphasized in the IBC. In this proposal, the technical restrictions in 703.4 have been relocated to Section 703.2, since this is where compliance with E119 is established in the IBC. It's a more suitable place for the fire-suppression system limitation to reside. Alternatives to E119, including the reference to alternative methods per Section 104.11, will once again be consolidated in 703.3 without having to rely on a separate section (703.4) that is redundant with respect to performance-based alternatives. If you compare the text of this proposal with the current text in 703.4, you will see that it is closely aligned so as to maintain the intent of current provisions while eliminating confusion and concern associated with Section 703.4. Note that existing subsections of Section 703.2 are to be retained without change and are shown for clarity to see how the provisions fit together.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

The proposal is a clarification of how the code applies.

Internal ID: 2374

FS2-18

IBC: 703.5, 703.5.1, 703.5.2

Proponent: Tim Earl, GBH International, representing self (tearl@gbhinternational.com)

2018 International Building Code

Revise as follows:

703.5 Noncombustibility tests. The tests indicated in ~~Sections~~ Section 703.5.1 ~~and 703.5.2~~ 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" 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~~ Non-combustible materials. Materials required to be noncombustible shall be tested in accordance with ASTM E136.

> **Exception:** Materials having a structural base of noncombustible material as determined in accordance with this section 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.

Delete without substitution:

~~**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.~~

Reason:

This current language is technically incorrect. The intent of the section title of Section 703.5.1 is to describe materials which are not layered and have a uniform structure throughout. This is complicated by the fact that the title is not reflected in the text of the section, so there is a disconnect. With Section 703.5.2, the problem is similar. While the title 'composite materials' isn't specifically used in the text, the text does describe a 'composite' of materials. In our efforts to correct the titles and have the titles clearly reflected in the text, we realized that a big part of the problem was the organization of these 3 sections. We believe our proposed solution results in clearer code and simpler code. This proposal does not result in any technical change to the code requirements.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

This proposal cleans up incorrect language and will have no impact on construction costs. It is essentially editorial.

Internal ID: 505

FS3-18

IBC: 703.5.1, Chapter 35

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.

Internal ID: 1091

FS4-18

IBC: 703.5.2

Proponent: Andy Williams, representing Metal Construction Association (afwilliams@Connect2amc.com)

2018 International Building Code

Revise as follows:

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 for each component of the composite or laminate material when tested in accordance with ASTM E84 or UL 723 shall be acceptable as noncombustible materials.

Reason:

Section 703.5.2 was added into the code long ago to allow gypsum wallboard to be recognized as a noncombustible material. While no adhesive material is typically used in gypsum, there are a number of exterior wall cladding materials that are currently using this section to allow recognition as a noncombustible element. These products typically consist of a noncombustible core (aluminum), in either a honeycomb or corrugated format with a relatively thin layer of aluminum attached to both faces. The adhesives used to make this attachment are combustible however Section 703.5.2 is being used as a reason to not be concerned with the introduction of this combustible element.

With the recent high rise building fires worldwide recently, the concern is rapid flame spread on the exterior of the building that could take place using the adhesive as a transfer method.

Making this proposed change would remove laminates and composites using combustible adhesives from the noncombustible product category and make these products be compliant with NFPA 285 Standard Fire Test Method for Evaluation of **Fire Propagation** Characteristics of Exterior Non-Load-Bearing Wall Assemblies Containing **Combustible Components** when required in the Exterior Wall Section 1402.5.

While the combustible WRB alone may be acceptable and not trigger the need for NFPA 285 Compliance (1402.5 Exception 1), The addition of two layers of combustible adhesive (front and back) of the laminate or composite material would definitely add combustible material and most likely make the wall assembly non-compliant with the exceptions to Section 1402.5.

Corrugated Core (End View)

Upper Section - Cut away view of honeycomb core, combustible adhesive, with exterior aluminum skin

Lower Section - Same panel with exterior aluminum skin removed.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

Cost of NFPA 285 testing would be added to the overall cost of this product. Similar cost addition as other combustible wall assemblies.

Internal ID: 1263

FS5-18

IBC: 703.8 (New)

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.

Internal ID: 942

FS6-18

IBC: 703.9 (New), Chapter 35

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

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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.

Internal ID: 943

FS7-18

IBC: 704.3 (New)

Proponent: Terry Maiers, BSB Design, Inc., representing BSB Design, Inc. (tmaiers@bsbdesign.com)

2018 International Building Code

Add new text as follows:

704.3 Protection of primary structural frame other than columns. Members of the primary structural frame other than columns that are required to have protection to achieve a fire-resistive rating and support more than two floors or one floor and roof or support a load-bearing wall or a non-load bearing wall more than two stories high, shall be provided individual encasement protection by protecting them on all side for the full length, including connections to other structural members, with materials having the required fire-resistive rating.

Exceptions:

1. Individual encasement protection on all sides shall be permitted on all exposed sides provided the extent of the protection is in accordance with the required fire-resistive rating, as determined in Section 703.
2. Where primary structural members are enclosed within a continuous horizontal membrane of fire-resistive rated construction that is equal to or greater that required by other sections of this code, shall not be required to be individually encased on any side of the primary structural member, including connections

Reason:

The reason for the requested change to the language of the section in question is that if the membrane enclosure is constructed to the established tested assembly then any structural member, whether primary or secondary would be protected by that tested assembly. It seems redundant to have a horizontal membrane from a tested assembly and to then include an additional level of protection that would exceed the required rating for the structural members contained within the tested horizontal membrane assembly.

As an example of an actual construction project, the floor/ceiling assembly of an A-3 occupancy and an R-2 occupancy is constructed of a primary steel frame system with horizontal beams connected to the steel columns. Either with a top bearing hanger framing system or a bottom chord bearing system, are placed wood trusses that support the floor sheathing with a finish topping of concrete along with a ceiling assembly of resilient channels and appropriate gypsum board ceiling. This is a very common floor/ceiling assembly type that has been tested by many agencies.

The issue of requiring a separate encasement of the individual primary structural members in these situations is illogical.

The reason for that statement is the fact the with or without the separate encasement protection as required by the current code, the wood framing members that are supporting the floor surface that the occupants would be walking on would be destroyed by the fire that has penetrated the one-hour rated assembly before the primary framing system has failed.

Cost Impact

The code change proposal will decrease the cost of construction .

The relative impact of the cost of construction in these cases would be appreciable to the client and the contractor. For example if you consider a situation where you are creating a 1-hour rated horizontal membrane cavity that supports a floor that is constructed of a mixed material f wood and steel that is supporting 3 - 4 floors above that level, you not only have to create the horizontal membrane that meets the tested assembly but you also have to completely encase the individual primary members as well. If this suggested change is approved then the need for the additional encasement eliminated and so is the cost.

Internal ID: 1792

FS8-18

IBC: 704.6.1 (New)

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.

Internal ID: 1476

FS9-18

IBC: TABLE 601, 704.11

Proponent: Jonathan Siu, City of Seattle Department of Construction and Inspections, representing Washington Association of Building Officials Technical Code Development Committee (Jon.Siu@seattle.gov)

2018 International Building Code

Revise as follows:

TABLE 601
FIRE-RESISTANCE RATING REQUIREMENTS FOR BUILDING ELEMENTS (HOURS)

BUILDING ELEMENT	TYPE I		TYPE II		TYPE III		TYPE IV	TYPE V	
	A	B	A	B	A	B	HT	A	B
Primary structural frame[f] (see Section 202)	3[a, b]	2[a, b]	1[b]	0	1[b]	0	HT	1[b]	0
Bearing walls and elements supporting primary or secondary structural frame members Exterior[e, f] Interior	3 3[a]	2 2[a]	1 1	0 0	2 1	2 0	2 1/HT	1 1	0 0
Nonbearing walls and partitions Exterior	See Table 602								
Nonbearing walls and partitions Interior[d]	0	0	0	0	0	0	See Section 2304.11.2	0	0
Floor construction and associated secondary members (see Section 202)	2	2	1	0	1	0	HT	1	0
Roof construction and associated secondary members (see Section 202)	$1^1/_2$[b]	1[b,c]	1[b,c]	0[c]	1[b,c]	0	HT	1[b,c]	0

For SI: 1 foot = 304.8 mm.

a. Roof supports: Fire-resistance ratings of primary structural frame and bearing walls are permitted to be reduced by 1 hour where supporting a roof only.

b. Except in Group F-1, H, M and S-1 occupancies, fire protection of structural members in roof construction shall not be required, including protection of primary structural frame members, roof framing and decking where every part of the roof construction is 20 feet or more above any floor immediately below. Fire-retardant-treated wood members shall be allowed to be used for such unprotected members.

c. In all occupancies, heavy timber complying with Section 2304.11 shall be allowed where a 1-hour or less fire-resistance rating is required.

d. Not less than the fire-resistance rating required by other sections of this code.

e. Not less than the fire-resistance rating based on fire separation distance (see Table 602).

f. Not less than the fire-resistance rating as referenced in Section 704.10.

704.11 ~~Bottom flange protection.~~Lintels, shelf angles, and plates. ~~Fire protection is not required at the bottom flange of lintels, shelf angles and plates, spanning not more than 6 feet 4 inches (1931 mm) whether part of the primary structural frame or not, and from the bottom flange of lintels, shelf angles and plates not part of the structural frame, regardless of span.~~

Fire protection shall be provided at the bottom flange of lintels, shelf angles and plates, where they span more than 6 feet 4 inches (1931 mm), and are an element of the structural frame.

Reason:

The first portion of this proposal is intended to clarify the requirements for fire protection of members supporting bearing walls. The second portion is partially editorial in nature, restating a requirement in the positive, rather than stating what is not required, but is also intended to be consistent with the first part of the proposal.

Table 601 regarding supporting members in bearing walls:

As currently written, the code does not address fire protection of members supporting bearing walls, whether that be bearing walls in their entirety or portions of bearing walls. This then leaves an open question for interpretation--are beams supporting bearing walls or lintels supporting portions of bearing walls considered part of the bearing wall with the associated protection, or are they primary or secondary structural frame, and protected accordingly?

The latter interpretation would be inconsistent with the code philosophy that members supporting important elements be protected to the same degree as those elements (for example, fire barriers and horizontal assemblies). On the other hand, from a structural standpoint, the former interpretation is problematic, as these members are **not** bearing walls, and therefore some would argue that the protection requirements for bearing walls do not apply.

This proposal addresses both issues. It recognizes that these structural members are going to be either primary or secondary structural frame, but requires them to be protected to the same degree as the bearing wall, consistent with code philosophy and structural understanding. The phrasing of the requirement is similar to what is used for secondary members in floor and roof construction in the same table. Locating the requirement in the text of the table as opposed to a footnote is consistent with code formatting principles of not putting significant requirements in footnotes.

Section 704.11 regarding lintels, shelf angles, and plates:

While the online Merriam-Webster dictionary broadly defines a lintel as "a horizontal architectural member spanning and usually carrying the load above an opening," our experience is the terms "lintels, shelf angles, or plates" as used in this section are generally intended to be used in the context of supporting concrete or masonry materials above.

As written, this section presumes fire protection is required for the bottom flange of lintels, shelf angles, and plates if they are part of the primary or secondary structural frame. It then goes on to say if the span is less than 6'-4", or if the element is not part of the structural frame, then protection is not required. Lintels above openings in masonry bearing walls generally are not supported on columns, and would therefore be secondary frame by definition. In accordance with this section, they are then required to be protected if they span more than 6'-4". However, Table 601 currently does not address secondary members that are supporting elements in bearing walls, as stated above.

This proposed rewrite turns the current language around to clearly state that protection is required if the span exceeds 6'-4" **and** is part of the structural frame. "Structural frame" would encompass both primary and secondary frame members. Consistent with the proposed change to Table 601, this proposal would require these lintels, shelf angles, and plates to be protected to the same degree as the wall they are supporting.

Related code change proposal:

A separate but related code change proposal has been submitted to clarify requirements for supporting fire walls and fire barriers. If this proposal and the fire wall/fire barrier proposals both pass, the combined Section 704.11 can appear as follows:

704.11 Lintels, shelf angles, and plates. Fire protection shall be provided at the bottom flange of lintels, shelf angles and plates, where they span more than 6 feet 4 inches (1931 mm) and meet at least one of the following conditions:

1. They are an element of the structural frame, or

2. They support fire wall or fire barrier construction.

Cost Impact

The code change proposal will increase the cost of construction .

Because this is a mostly a clarification of the current code language, the impact on cost of construction will depend on how a local jurisdiction is interpreting the current code provisions. If the jurisdiction is requiring fireproofing consistent with structural frame items in Table 601, this proposal could result in increased cost for providing fireproofing for beams or lintels, or for increased fireproofing materials in some cases where primary or secondary structural frame has a lower required fire-resistance rating than bearing wall rating (see Types III and IV construction). However, if the local jurisdiction already requires lintels and beams supporting bearing walls to have the same fire-resistance rating as the bearing wall they are supporting, then there will be no change in the cost of construction.

Internal ID: 581

FS10-18

IBC: SECTION 202, 202, 704.14 (New), 603.1, 722.5.2.2, 722.5.2.3

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.

Internal ID: 1989

FS11-18

IBC: SECTION 202, 202 (New), 705, 705.1, 705.2, TABLE 705.2, 705.2.1, 705.2.2, 705.2.3, 705.2.3.1, 705.8.1

Proponent: Lee Kranz, City of Bellevue, representing City of Bellevue, WA (lkranz@bellevuewa.gov)

2018 International Building Code

SECTION 202 DEFINITIONS

Add new definition as follows:

OPENING EXTERIOR. Fenestration, doors, hatches, vents, intake or exhaust grilles and similar elements installed in an exterior wall or roof assembly. Portions of the building perimeter covered by roofs or stories extending beyond an exterior wall below and not provided with a physical barrier commonly considered to be an exterior wall.

Revise as follows:

705 EXTERIOR WALLS AND PROJECTIONS

705.1 General. *Exterior walls and projections* shall comply with this section.

705.2 Projections. Cornices, eave overhangs, exterior balconies, elevated floors, roof assemblies and similar projections extending beyond the exterior wall 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 shall not extend any closer to the line used to determine the *fire separation distance* than shown in Table 705.2.

~~Exception~~ Exceptions:

1. 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.
2. Elevated floors and roof assemblies extending beyond the exterior wall shall not be considered to be projections if of Type I or Type II construction.

TABLE 705.2
MINIMUM DISTANCE OF PROJECTION

FIRE SEPARATION DISTANCE-FSD (feet)	MINIMUM DISTANCE FROM LINE USED TO DETERMINE FSD
0 to less than 2	Projections not permitted
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 ~~from~~ extending beyond exterior 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 ~~from~~ extending beyond exterior walls of Type III, IV or V construction shall be of any *approved* material.

705.2.3 Combustible projections. Combustible projections, including elevated roof and floor assemblies projecting beyond the exterior wall and 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 and similar 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 and similar ~~projections~~ elements projecting from exterior walls 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 areas, the~~ and the aggregate length of the balcony on each floor shall not be limited where sprinkler protection is extended to these areas.

705.8.1 Allowable area of openings. The maximum area of unprotected and protected openings permitted in an *exterior wall* in any *story* of a building shall not exceed the percentages specified in Table 705.8 based on the *fire separation distance* of each individual story.

Exceptions:

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

Reason:
FS17-15 was approved for the 2018 IBC. It makes it clear that fire separation distance must be measured from the property line to the physical exterior wall, even if it is located a signficant distance back under a story or roof projecting beyond the exterior wall (visualize an upside down wedding cake). This brought to light a basic flaw in the code related to building designs where an elevated floor or roof extends beyond the exterior wall toward the property

line. For example, under the current provisions, in a type V-B combustible building, an upper story or roof projecting beyond the exterior wall is not limited in terms of how close it may come to the property line. Since 705.2 is intended to only address elements projecting "from an exterior wall" and not "floors or roofs extending beyond an exterior wall" the open side created by these designs is not regulated thereby creating a high potential for conflegration fires. Consistancy in application of this basic code concept is critical to prevent fires from spreading from one building to another. In a resent survey of ICC plan check engineers, it was clear that the current code language does not provide clear direction on how to protect buildings when elevated floors or roofs extend beyond the exterior wall. If this proposal is approved it will provide the needed direction and create consistancy in application.

FS17-15

705.8.1

Proposed Change as Submitted

Proponent : Stephen Thomas, representing Colorado Chapter (sthomas@coloradocode.net)

2015 International Building Code

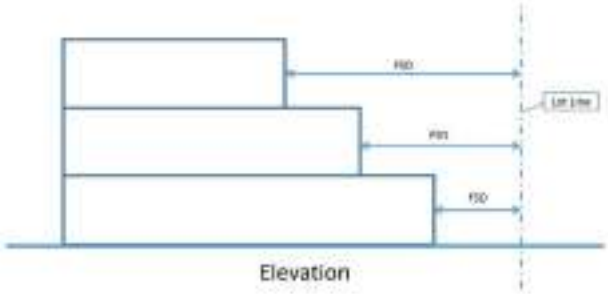
Revise as follows:

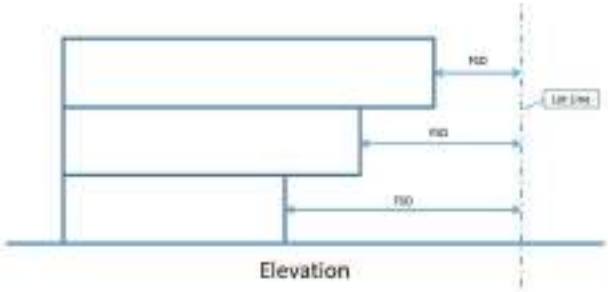
705.8.1 Allowable area of openings. The maximum area of unprotected and protected openings permitted in an exterior wall in any story of a building shall not exceed the percentages specified in Table 705.8 based on the fire separation distance of each individual story.

Exceptions:

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

Reason: The intent of this change is to clarify that the limitation of openings in exterior walls is based on the fire separation distance of each individual story. There appears to be confusion on how to evaluate openings in exterior walls when an upper floor extends out over a lower floor. We believe that the opening protection is determined at the exterior wall of the story, not the wall plane of the story above. Just the opposite would be true if the building was a pyramid style building where the upper floors step back from the floor below. The opening protection would depend on the distance to the lot line at each story, not the first story. Please see attached diagrams.





Cost Impact: Will not increase the cost of construction
The change clarifies the intent of the code. There is no affect on the construction cost.

FS17-18 | 705.8.1-THOMAS6668

Public Hearing Results

Committee Action: **Approved as Submitted**

Committee Reason: The committee agreed that this proposal clarifies that the limitation of openings in exterior walls is based on the fire separation distance of each individual story, rather than only based on the FSD of the first story.

Assembly Action : **None**

Individual Consideration Agenda

Public Comment 1:

Proponent : Ali Fattah, City of San Diego Development Services, representing City of San Diego (afattah@sandiego.gov) requests Disapprove.

Commenter's Reason: We urge disaproval of this code change.
The proposed code change was approved by the committee in lieu of FS 18 even though they addressed two different issues. FS 17 addresses the method of measurement. FS 18 address the hazards of usable space under a story of a building that is larger than the story below.

The definition of fire separation distance in Section 202 is a measurement from the building face and is a method of measurement to a reference point whether a lot line or an imaginary line. It stands to reason that if the code intent is for a lot line or imaginary line to be vertical that there should be one line used for measurement purposes. When the term is used the code intends it to be used as a measurement to the same reference so the code change is not necessary. The code change however has a negative consequence and reduces fire protection without technical justification. Additionally the definition add in FS 11 may lead to the portion of the upper story projecting beyond the lower smaller story a projection.

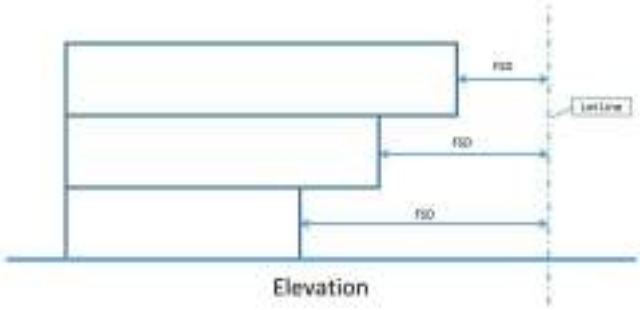
Additionally Section 705.5 and 705.8.1 makes clear that the area measurement for openings is per story based on the fire separation distance (which is to the building face). Evaluation of the inverted wedding cake scenario should be evaluated on a case by case basis and this code change does not allow for that. FS 18 was addressing an issue that Section 705.5 and Table 602 never require an exterior wall but tell when an exterior wall needs to be fire resistance rated based on occupancy, type of construction and fire separation distance. An exterior wall should be required to protect a neighboring property from the hazards of an occupancy and its fire loading. FS 17 would allow a upper story located 6 inches from a lot line with no exterior wall openings to have a story below with no exterior wall with occupants able to touch the neighboring property's fence or event the exterior wall.

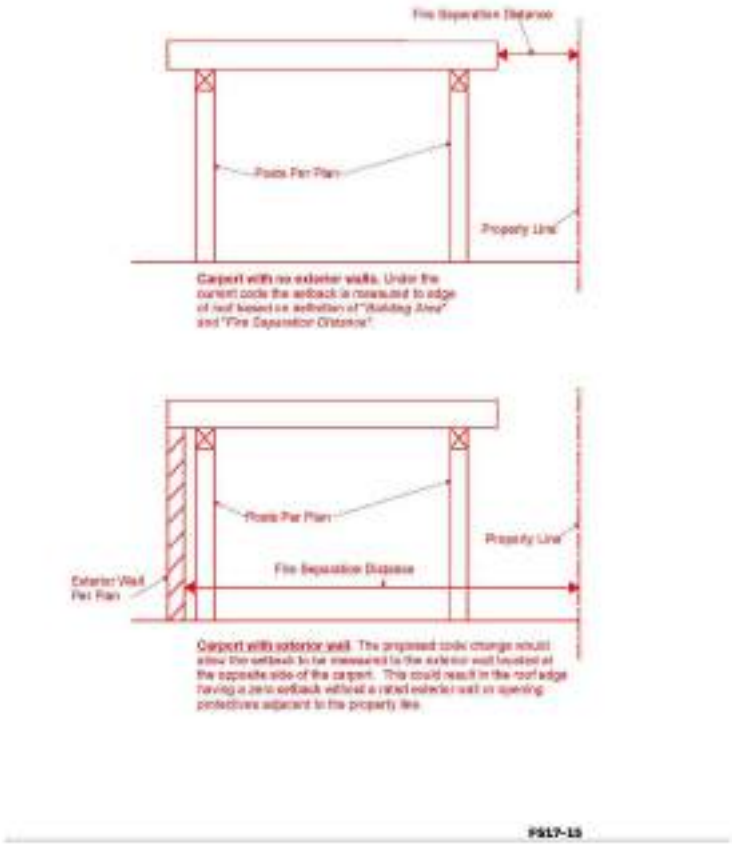
Public Comment 2:

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

Commenter's Reason: The image below, which was provided in the proponent's original reason statement, shows a multi-story building with upper levels extending closer to the property line than the lower levels. In many cases, areas located below the upper levels would count as floor area based on the definition of *Building area*. The text in this definition states that "Areas of the building not provided with surrounding walls shall be included in the building area if such areas are included within the horizontal projection of the roof or floor above". There have been many case studies of conflagration fires due to radiant heat transfering from one building to the projecting horizontal surfaces of another building if that building is located too close to the property line and has not been provided with rated exterior walls and protected openings at the outboard edge of the overhang.
This code change also does not address exterior wall and opening protection for

structures with no exterior walls such as carports (see carport illustrations below). Does constructing a wall below the edge of a carport roof on the side opposite to the property line setback change the way fire would spread from one parcel improvement to the other? Based on this code change, constructing such a wall would allow the open side of the carport to extend all the way to the property line because the setback to the exterior wall would be on the side opposite of the open carport roof edge. This code change has potentially dangerous consequences and should not be approved.





Cost Impact

The code change proposal will increase the cost of construction .

There may be cases where additional fire protection assemblies will be required on the open sides of buildings having overhanging floors or roofs that extend beyond the exterior wall of a floor below.

Internal ID: 92

FS12-18

IBC: 705, 705.1, 705.2, 705.2.4 (New)

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:

SECTION 705 EXTERIOR WALLS AND PROJECTIONS

705.1 General. *Exterior walls* and projections shall comply with this section.

705.2 Projections. Cornices, roof and eave overhangs, projecting floors above, exterior balconies and similar projections extending beyond the exterior wall 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 shall not extend any closer to the line used to determine the *fire separation distance* than shown in Table 705.2.

~~Exception~~ Exceptions:

1. 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.
2. Projecting floors complying with Section 705.2.4 are not required to comply with the projection limitations of Table 705.2.

Add new text as follows:

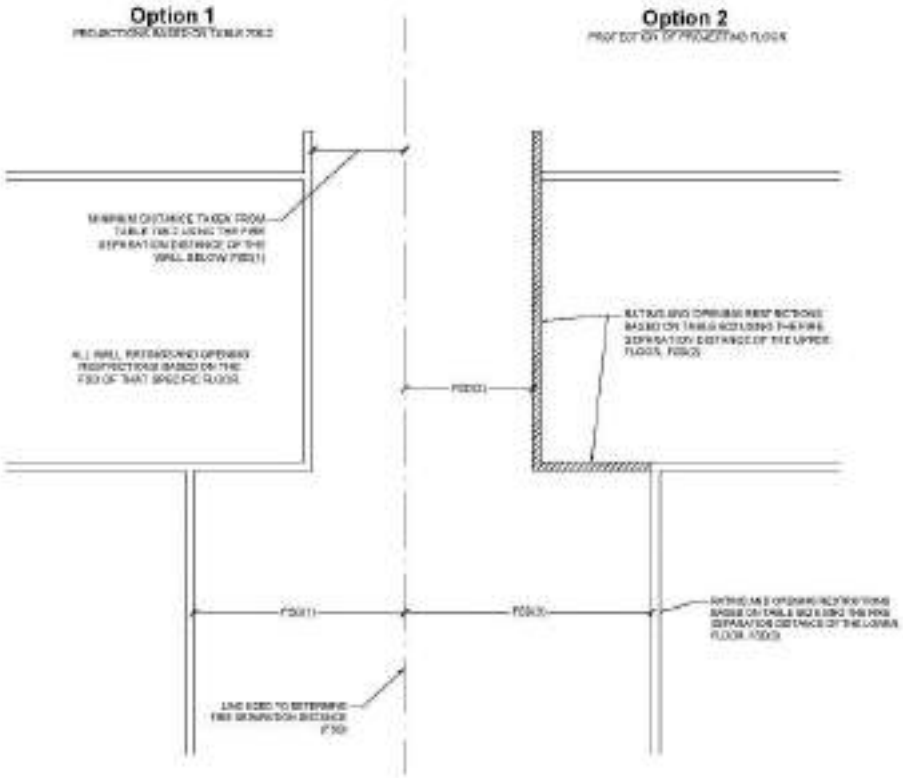
705.2.4 Projecting floors. Where the fire separation distance on a lower floor is greater than the fire separation distance on the floor immediately above, the projecting floor shall have the same fire-resistance rating as the exterior wall above based on Table 602. The fire-resistant rating of the horizontal portion shall be continuous to the lower vertical wall.

Exception: Buildings of Type I or Type II construction

Reason:

The current code does not account for a scenario where an upper floor extends closer to a lot line than the floor below. There is direction that indicates that fire separation distance will be measured to the face of the exterior wall on each floor level separately. This could create an unsafe condition where a lower floor has less stringent requirements than a floor/ceiling assembly and wall above, and fire may be able to propagate through roll out from the lower floor.

This situation is similar to the flame spread conditions of projections. Including projecting floors as projections will help limit the dangers by making the floor above meet the projection requirements. The exception allows for the projections table to not apply where the horizontal surface is given the same fire-resistant rating as the more hazardous wall above.



Cost Impact

The code change proposal will increase the cost of construction .

There will be no change in the cost of construction for Type I and II buildings. For other types the cost to install fire resistance rated soffit materials for projecting floors will increase the cost of construction.

Internal ID: 416

FS13-18

IBC: 705.1, 705.2

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

2018 International Building Code

Revise as follows:

705.1 General. *Exterior walls* shall comply with this section and Section 1405.

705.2 Projections. Cornices, eave overhangs, exterior balconies and similar projections extending beyond the exterior wall 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 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.

Reason:

Section 1405 is titled "Combustible materials on the exterior side of exterior walls". There is no language in that section that discusses projections. Therefore, the cross reference in Section 705.2 which relates to projections is not in the correct place. So, I relocated the cross reference to the General Section 705.1. It could be argued that Section 1405 should be relocated to Section 705 since it has to do with the fire characteristics of exterior walls. I will let the committee decide whether that is appropriate. This change is just to make sure the reference is in the correct location.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

The change is a clarification and does not change any technical requirements.

Internal ID: 1857

FS14-18

IBC: TABLE 705.2

Proponent: Todd Snider, West Coast Code Consultants (WC3), representing Self (Todd@KimballEng.com)

2018 International Building Code

Revise as follows:

TABLE 705.2
MINIMUM DISTANCE OF 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~~ 2/3 the FSD
5 or greater	40 inches

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

Reason:

Proposed revision to change the step function for determining distance from line used to determine FSD. From 0 to 3 feet the code requires a lengthy equation which states that a 24 inch separation plus 8 inches for every foot of FSD beyond 3 feet or fraction thereof. This equation is complicated and is not very helpful when the line used for determining FSD is not parallel to the exterior wall. For example take a wall where the FSD increases from 3 feet at one end of the wall to 5 feet at the far end of the wall. At three feet the separation requires is 24 inches which allows a 12 inch projects. As the FSD increases to say 3’-1”, this would require a separation of 24 inches plus 8 inches which is 32 inches of separation which reduces the projection to 5 inches. The FSD has increased but the size of the projection has decreased. A 12 inch projection is not allowed again until the FSD reaches 3’-8”. Then the projection will increase to 16 inches at a FSD of 4 feet. As the FSD continues to increase at 4’-1” the allowed projection will reduce to 9 inches (49”-24”-2*8” = 40” separation), which is again not only less than what was permitted at 4 feet FSD but also less than what was allowed with only a 3 foot FSD. A 16 inch projection will not be allowed again until 4’-8” FSD. At which time separation is set at 40 inches and the size of the projection increases at the same rate as the FSD increases. The solution is to provide a linear equation to determine the separation distance. 2/3 of the FSD.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

This code change has no cost affect. It will just simplify the determination for distance of projections to FSD.

Internal ID: 1275

FS15-18

IBC: SECTION 202, 202 (New), 705.2, TABLE 705.2, 705.2.1, 705.2.2, 705.2.3, 705.2.3.1, 705.3

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.

Internal ID: 1468

FS16-18

IBC: 705.2.3

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

2018 International Building Code

Delete and substitute as follows:

~~**705.2.3 Combustible projections.** Combustible 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 Projection Protection. Projections extending to within 5 feet (1524 mm) of the line used to determine the fire separation distance shall be one of the following:

1. Noncombustible materials.
2. Combustible materials of not less than 1 hour fire resistance rated construction.
3. Heavy timber construction complying with Section 2304.11.
4. Fire-retardant treated wood.
5. 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).

Reason:

The current language in this section is limited to combustible projections. There is no language in the code that tells the user what to do if they are using noncombustible materials in a Type I or II building. The current language would apparently allow that noncombustible projection to go right up to the lot line. So, I have deleted the word combustible in the section so that it would apply to all types of projections regardless of the materials used. I have also added noncombustible materials to the items permitted to go into the 5 foot limitation. The previous language would not permit noncombustible projections into the five feet limitation because it wasn't listed. So, this change will address that issue as well. This change also puts the requirements into a list which we have found makes the code easier to use. This change does not change the overall requirement. I believe it clarifies the code and gives better direction to the user of the code.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

This is intended to be a clarification of the code, not a change to the technical requirements.

Internal ID: 1683

FS17-18

IBC: 705.2.5 (New)

Proponent: Matthew Dobson, representing Suburban Exterior Fire Work Group; Richard Swan, International Association of Fire Fighters, representing International Association of Fire Fighters (rswan@iaff.org)

2018 International Building Code

Add new text as follows:

705.2.5 Protected soffit. In Group R buildings of Type V construction a protected soffit or fireblocking shall be provided above doorways in exterior walls. It shall extend horizontally 5 feet in both directions measured from the outside edge of the door frame. A protected soffit shall not be required where noncombustible wall cladding is installed from grade to not less than 10 feet above grade.
Soffit protection shall be applied to the horizontal underside of the roof framing members or fireblocking shall be provided in accordance with Section 718.2.1. Soffit protection shall consist of not less than one of the following materials:

1. 5/8 inch exterior grade gypsum board.
2. 1/4 inch Fiber-cement board.
3. 23/32 inch plywood.
4. 23/32 inch OSB.
5. 7/16 inch OSB Fire retardant treated wood.

Enclosed soffits shall be constructed as ventilated spaces in accordance with Section 1202.2 or unvented assemblies in accordance with Section 1202.3. Soffit panels shall be vinyl, wood structural panel, aluminum, fiber cement, or other approved soffit materials.

Reason:
Over the past code cycles there has been concern over smoker habits, combustible mulch, and the potential hazard they pose with combustion of exterior walls. The Suburban Exterior Fire Work Group, a group of fire service members, UL fire fighter safety institute, and other material stakeholders has been focused on this issue over the past 18 months.

The problem identified is the spread of fire from the exterior into to the unprotected attic space and then spreading quickly to other parts of the building.

The group has taken a 3 prong approach to address the issue:

Regulate the human risk by prohibiting smoking near exterior doors.
Remove combustible material/mulch from near the outside of combustible wall assemblies.
Create a block to slow down any fires that occur in the above described setting.
The proposed protected soffit approach will require a form of blocking outside of exterior doorways and garage doors. These proposed material have been required in North Carolina for over 5 years and are accepted to provide some form of blocking that will slow down the movement of fire from the outside to the attic space, effectively helping to address the issue and allow fire service more time put out the fire. Testing on these protected soffits are currently underway to show the effectiveness of these assemblies both vented and unvented.

Over the decade, fire departments in the Washington, DC region have been confronted with structure fires which have demonstrated a consistent pattern of starting on the outside. These fires have the potential for rapid loss of structural integrity and catastrophic collapse before occupants are alerted. As attention has grown locally, it is apparent that this type of fire is becoming common on a national basis.

These fires tend to follow a distinct pattern. These fires start at a low point on the exterior and spread vertically along the exterior wall producing flammable gases, which are readily admitted into the attic area through ventilation soffits. If not cooled, these heated gases accumulate and combust, creating rapidly spreading fire conditions in the attic area, often without occupant awareness. The unchecked fire often results in full roof involvement, creating a dangerous and difficult situation for occupants and fire fighters.

The group examined a number of structure fires which have exhibited the pattern described above. There is agreement over 3 common aspects. First, these fires often result from careless smoking habits. Second, when the smoking materials are not properly disposed of, they often come into contact with combustible materials adjacent to a building and, very commonly, this is mulch. And, last, the combustible exterior wall is a factor in the the growth of these fires into the attic space.

The careless smoker is an impediment to effective fire prevention efforts. The fire service has consistently provided data that shows smoking is the leading cause of fatal fires in the United States. Public fire and life safety efforts have been reasonably effective at communicating the message to not smoke in bed, and various medical organizations have demonstrated the health risk associated with "second hand" smoke. We now see that people are routinely smoking outside, at or near the entrance to a building, which increases the possibility of an accidental ignition of outside combustibles. If one were to chronicle the actions of today's smoker, it would likely show the last action they take when exiting a building is to "light up." When returning inside, they often drop the cigarette near the entrance. Many smokers seem to believe that dropping a match or cigarette onto the ground or into a flower pot is an effective method of extinguishment, however, this behavior often places the smoking material directly into the mulch, initiating the low fire described earlier.

Mulch has become a common exterior decorative material which aids in suppressing weed growth while enhancing a building's curb appeal. However, most mulch is a dead organic material, comprised of chipped wood, tree bark or pine needles. Mulch is most effective when it is maintained in a moist state, however it can dry out very quickly and become a readily ignitable fuel source. Because of its relatively small mass in comparison to its surface area, when ignited, it will progress and sustain open flame.

The group discussed a method in which to proceed, the interest being to address, in the quickest manner, industrial and social changes which could reduce the possibility of a fire on the outside of a building. Each aspect presents unique challenges for fire prevention efforts:

1. Changing the behavior of the smoker is an ongoing and difficult challenge, especially as social pressures have resulted in regulatory changes to require people to smoke outside of a building. Further development of the "fire safe" cigarette, by way of testing using mulch, could be deemed too costly for the industry, and would have no effect on improper disposal of matches. Thus, the quickest and most practical strategy for this aspect of the problem is to expand public fire and life safety education to focus on the hazards of improper disposal of smoking materials, coupled with enforcement of applicable requirements for regulation of smoking and disposal of products. However, in this age of "information overflow" it is questionable if this would result in widespread behavioral changes for smokers;

2. Regulating the use and placement of mulch, that the study group believes could have the quickest and most significant impact toward reducing the exterior fire problem, while additional strategies to address the other problems noted are pursued.

The use of wood and wood related mulch for building decoration is purely optional. It is not a required construction component under current building codes. Therefore, regulations to curtail its use or require that it be separated from a building's combustible exterior are reasonable and could be codified on a national basis. On a large scale, the mere action of creating separation of combustible materials has been a wildland fire tactic for years. Several states and local jurisdictions have already employed this theory by either recommending or requiring that wood-based mulch be separated from exterior combustible walls:

1. The Virginia Department of Forestry recommends to "provide a minimum of an 18 inch clearance between landscaping mulch beds and combustible building materials" and to "ensure proper clearance to electric devices, such as decorative lights, by following the manufacturer's instructions;"

2. In Raleigh, NC, following a disastrous fire in a multi-family building, the city passed a pine straw mulch ordinance that bans the use of pine straw as ground cover within 10 feet of multi-family dwellings. The ordinance exempts 1 and 2-family dwellings, however, the city strongly encourages these homeowners to comply with the pine straw restrictions;

3. The Commonwealth of Massachusetts prohibits the new application of mulch within 18 inches around combustible exteriors of buildings, such as wood or vinyl but not brick or concrete. Residential buildings with six units or less are exempted from this regulation, but it is recommended that all homeowners adopt these safety practices. The regulation applies to all other buildings including commercial properties.

4. Ventura County, CA prohibits mulch and wood chips within the required "defensible space" zone (which ranges from 0' to 30' from the exterior of a building).

This small sampling of jurisdictions has produced enough evidence to lead the study group to suggest the possible introduction of a code proposal to require separation, or non-application, of wood-based mulch in proximity to combustible exterior walls.

The proposed protected soffit approach will require a form of blocking outside of exterior doorways and garage doors. These proposed material have been required in North Carolina for over 5 years and are accepted to provide some form of blocking that will slow down the movement of fire from the outside to the attic space, effectively helping to address the issue and allow fire service more time put out the fire.

We think this approach is effective, efficient, and cost effective.

Cost Impact

The code change proposal will increase the cost of construction .

This change will add some cost to construction. However the change is designed to used potentially scrap material on site to act as blocking so cost should not be very much. There will be some labor to install the protected soffitt or blocking.

Internal ID: 1058

FS18-18

IBC: 705.5, TABLE 705.5, 602.1, TABLE 601, 705.6, 402.4.2.2, 402.4.2.3, 406.5.6, 704.10, 705.11, 1510.2.4, 1020.1, 2103.1, 3103.3

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

2018 International Building Code

Revise as follows:

705.5 Fire-resistance ratings. *Exterior walls* shall be fire-resistance rated in accordance with Tables 601 ~~and 602 and this section.~~ based on the Type of Construction and Table 705.5 and this section based on the Fire Separation Distance. The required *fire-resistance rating* of *exterior walls* with a *fire separation distance* of greater than 10 feet (3048 mm) shall be rated for exposure to fire from the inside. The required *fire-resistance rating* of *exterior walls* with a *fire separation distance* of less than or equal to 10 feet (3048 mm) shall be rated for exposure to fire from both sides.

TABLE ~~602~~705.5

FIRE-RESISTANCE RATING REQUIREMENTS FOR EXTERIOR WALLS BASED ON FIRE SEPARATION DISTANCE[a, d, g]

FIRE SEPARATION DISTANCE =X (feet)	TYPE OF CONSTRUCTION	OCCUPANCY GROUP H[e]	OCCUPANCYGROUP F-1, M, S-1[f]	OCCUPANCYGROUP A, B, E, F-2, I, R[i], S-2, U[h]
X < 5[b]	All	3	2	1
5 ≤ X < 10	IA	3	2	1
	Others	2	1	1
10 ≤ X < 30	IA, IB	2	1	1[c]
	IIB, VB	1	0	0
	Others	1	1	1[c]
X ≥ 30	All	0	0	0

For SI: 1 foot = 304.8 mm.

a. Load-bearing exterior walls shall also comply with the fire-resistance rating requirements of Table 601.

b. See Section 706.1.1 for party walls.

c. Open parking garages complying with Section 406 shall not be required to have a fire-resistance rating.

d. The fire-resistance rating of an exterior wall is determined based upon the fire separation distance of the exterior wall and the story in which the wall is located.

e. For special requirements for Group H occupancies, see Section 415.6.

f. For special requirements for Group S aircraft hangars, see Section 412.3.1.

g. Where Table 705.8 permits nonbearing exterior walls with unlimited area of unprotected openings, the required fire-resistance rating for the exterior walls is 0 hours.

h. For a building containing only a Group U occupancy private garage or carport, the exterior wall shall not be required to have a fire-resistance rating where the fire separation distance is 5 feet (1523 mm) or greater.

i. For a Group R-3 building of Type II-B or Type V-B construction, the exterior wall shall not be required to have a fire-resistance rating where the fire separation distance is 5 feet (1523 mm) or greater.

602.1 General. Buildings and structures erected or to be erected, altered or extended in height or area shall be classified in one of the five construction types defined in Sections 602.2 through 602.5. The building elements shall have a *fire-resistance rating* not less than that specified in Table 601 and exterior walls shall have a *fire-resistance rating* not less than that specified in Table ~~602.~~ 705.5. Where required to have a *fire-resistance rating* by Table 601, building elements shall comply with the applicable provisions of Section 703.2. The protection of openings, ducts and air transfer openings in building elements shall not be required unless required by other provisions of this code.

TABLE 601
FIRE-RESISTANCE RATING REQUIREMENTS FOR BUILDING ELEMENTS (HOURS)

BUILDING ELEMENT	TYPE I		TYPE II		TYPE III		TYPE IV	TYPE V	
	A	B	A	B	A	B	HT	A	B
Primary structural frame[f] (see Section 202)	3[a, b]	2[a, b]	1[b]	0	1[b]	0	HT	1[b]	0
Bearing walls Exterior[e, f] Interior	 3 3[a]	 2 2[a]	 1 1	 0 0	 2 1	 2 0	 2 1/HT	 1 1	 0 0
Nonbearing walls and partitions Exterior	See Table 705.5								
Nonbearing walls and partitions Interior[d]	0	0	0	0	0	0	See Section 2304.11.2	0	0
Floor construction and associated secondary members (see Section 202)	2	2	1	0	1	0	HT	1	0
Roof construction and associated secondary members (see Section 202)	$1^1/_2$[b]	1[b,c]	1[b,c]	0[c]	1[b,c]	0	HT	1[b,c]	0

For SI: 1 foot = 304.8 mm.

a. Roof supports: Fire-resistance ratings of primary structural frame and bearing walls are permitted to be reduced by 1 hour where supporting a roof only.

b. Except in Group F-1, H, M and S-1 occupancies, fire protection of structural members in roof construction shall not be required, including protection of primary structural frame members, roof framing and decking where every part of the roof construction is 20 feet or more above any floor immediately below. Fire-retardant-treated wood members shall be allowed to be used for such unprotected members.

c. In all occupancies, heavy timber complying with Section 2304.11 shall be allowed where a 1-hour or less fire-resistance rating is required.

d. Not less than the fire-resistance rating required by other sections of this code.

e. Not less than the fire-resistance rating based on fire separation distance (see Table ~~602~~705.5).

f. Not less than the fire-resistance rating as referenced in Section 704.10.

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~~ 705.5 for the exterior wall.

402.4.2.2 Anchor building separation. An *anchor building* shall be separated from the *covered or open mall building* by *fire walls* complying with Section 706.

Exceptions:

1. *Anchor buildings* of not more than three stories *above grade plane* that have an occupancy classification the same as that permitted for tenants of the *mall building* shall be separated by 2-hour fire-resistance-rated *fire barriers* complying with Section 707.
2. The exterior walls of *anchor buildings* separated from an *open mall building* by an *open mall* shall comply with Table ~~602~~ 705.5.

402.4.2.3 Parking garages. An attached garage for the storage of passenger vehicles having a capacity of not more than nine persons and *open parking garages* shall be considered as a separate building where it is separated from the *covered or open mall building* or anchor building by not less than 2-hour *fire barriers* constructed in accordance with Section 707 or *horizontal assemblies* constructed in accordance with Section 711, or both.

Parking garages, which are separated from *covered mall buildings*, *open mall buildings* or *anchor buildings*, shall comply with the provisions of Table ~~602.~~705.5.

Pedestrian walkways and tunnels that connect garages to *mall* buildings or *anchor buildings* shall be constructed in accordance with Section 3104.

406.5.6 Fire separation distance. *Exterior walls* and openings in *exterior walls* shall comply with Tables 601 and ~~602.~~ 705.5. The distance to an adjacent *lot line* shall be determined in accordance with Table ~~602~~705.5 and Section 705.

704.10 Exterior structural members. Load-bearing structural members located within the *exterior walls* or on the outside of a building or structure shall be provided with the highest *fire-resistance rating* as determined in accordance with the following:

1. As required by Table 601 for the type of building element based on the type of construction of the building.
2. As required by Table 601 for exterior bearing walls based on the type of construction.
3. As required by Table ~~602~~705.5 for *exterior walls* based on the *fire separation distance*.

705.11 Parapets. Parapets shall be provided on *exterior walls* of buildings.

Exceptions: A parapet need not be provided on an *exterior wall* where any of the following conditions exist:

1. The wall is not required to be *fire-resistance rated* in accordance with Table ~~602~~ 705.5 because of *fire separation distance*.
2. The building has an area of not more than 1,000 square feet (93 m^2) on any floor.

3. Walls that terminate at roofs of not less than 2-hour fire-resistance-rated construction or where the roof, including the deck or slab and supporting construction, is constructed entirely of noncombustible materials.

4. One-hour fire-resistance-rated *exterior walls* that terminate at the underside of the roof sheathing, deck or slab, provided that:

   4.1. Where the roof/ceiling framing elements are parallel to the walls, such framing and elements supporting such framing shall not be of less than 1-hour fire-resistance-rated construction for a width of 4 feet (1220 mm) for Groups R and U and 10 feet (3048 mm) for other occupancies, measured from the interior side of the wall.

   4.2. Where roof/ceiling framing elements are not parallel to the wall, the entire span of such framing and elements supporting such framing shall not be of less than 1-hour fire-resistance-rated construction.

   4.3. Openings in the roof shall not be located within 5 feet (1524 mm) of the 1-hour fire-resistance-rated *exterior wall* for Groups R and U and 10 feet (3048 mm) for other occupancies, measured from the interior side of the wall.

   4.4. The entire building shall be provided with not less than a Class B roof covering.

5. In Groups R-2 and R-3 where the entire building is provided with a Class C roof covering, the *exterior wall* shall be permitted to terminate at the underside of the roof sheathing or deck in Types III, IV and V construction, provided that one or both of the following criteria is met:

   5.1. The roof sheathing or deck is constructed of *approved* noncombustible materials or of *fire-retardant-treated wood* for a distance of 4 feet (1220 mm).

   5.2. The roof is protected with 0.625-inch (16 mm) Type X gypsum board directly beneath the underside of the roof sheathing or deck, supported by not less than nominal 2-inch (51 mm) ledgers attached to the sides of the roof framing members for a minimum distance of 4 feet (1220 mm).

[BG] 1510.2.4 Type of construction. Penthouses shall be constructed with walls, floors and roofs as required for the type of construction of the building on which such penthouses are built.

Exceptions:

1. On buildings of Type I construction, the exterior walls and roofs of penthouses with a *fire separation distance* greater than 5 feet (1524 mm) and less than 20 feet (6096 mm) shall be permitted to have not less than a 1-hour fire-resistance rating. The exterior walls and roofs of penthouses with a fire separation distance of 20 feet (6096 mm) or greater shall not be required to have a fire-resistance rating.

2. On buildings of Type I construction two stories or less in height above grade plane or of Type II construction, the exterior walls and roofs of penthouses with a *fire separation distance* greater than 5 feet (1524 mm) and less than 20 feet (6096 mm) shall be permitted to have not less than a 1-hour fire-resistance rating or a lesser fire-resistance rating as required by Table ~~602~~705.5 and be constructed of *fire-retardant-treated wood*. The exterior walls and roofs of penthouses with a *fire separation distance* of 20 feet (6096 mm) or greater shall be permitted to be constructed of fire-retardant-treated wood and shall not be required to have a fire-resistance rating. Interior framing and walls shall be permitted to be constructed of *fire-retardant-treated wood*.

3. On buildings of Type III, IV or V construction, the exterior walls of penthouses with a *fire separation distance* greater than 5 feet (1524 mm) and less than 20 feet (6096 mm) shall be permitted to have not less than a 1-hour fire-resistance rating or a lesser fire-resistance rating as required by Table ~~602~~7. 05.5. On buildings of Type III, IV or VA construction, the exterior walls of penthouses with a *fire separation distance* of 20 feet (6096 mm) or greater shall be permitted to be of heavy timber construction complying with Sections 602.4 and 2304.11 or noncombustible construction or *fire-retardant-treated wood* and shall not be required to have a fire-resistance rating.

1020.1 Construction. Corridors shall be fire-resistance rated in accordance with Table 1020.1. The *corridor* walls required to be fire-resistance rated shall comply with Section 708 for *fire partitions*.

Exceptions:

1. A *fire-resistance rating* is not required for *corridors* in an occupancy in Group E where each room that is used for instruction has not less than one door opening directly to the exterior and rooms for assembly purposes have not less than one-half of the required *means of egress* doors opening directly to the exterior. Exterior doors specified in this exception are required to be at ground level.
2. A *fire-resistance rating* is not required for *corridors* contained within a *dwelling unit* or *sleeping unit* in an occupancy in Groups I-1 and R.
3. A *fire-resistance rating* is not required for *corridors* in open parking garages.
4. A *fire-resistance rating* is not required for *corridors* in an occupancy in Group B that is a space requiring only a single *means of egress* complying with Section 1006.2.
5. Corridors adjacent to the *exterior walls* of buildings shall be permitted to have unprotected openings on unrated *exterior walls* where unrated walls are permitted by Table ~~602~~ 705.5 and unprotected openings are permitted by Table 705.8.

2103.1 Masonry units. Concrete masonry units, clay or shale masonry units, stone masonry units, glass unit masonry and AAC masonry units shall comply with Article 2.3 of TMS 602. Architectural cast stone shall conform to ASTM C1364 and TMS 504. Adhered manufactured stone masonry veneer units shall conform to ASTM C1670.

Exception: Structural clay tile for nonstructural use in fireproofing of structural members and in wall furring shall not be required to meet the compressive strength specifications. The fire-resistance rating shall be determined in accordance with ASTM E119 or UL 263 and shall comply with the requirements of Table ~~602.~~705.5.

3103.3 Location. Temporary structures shall be located in accordance with the requirements of Table ~~602~~705.5 based on the *fire-resistance rating* of the *exterior walls* for the proposed type of construction.

Reason:
When someone looks in the Table of Contents or Index of the code for exterior walls, they are sent to Section 705. However, the requirements for the fire-resistance rating of the exterior walls are hidden back in the Type of Construction Chapter 6. Type of construction deals with the materials and fire-resistance rating of building elements based on the size of the building. Exterior wall fire-resistance ratings are based on Fire Separation Distance. These are two separate issues. Therefore, we are proposing to move Table 602 back to the appropriate Section 705 where it belongs. There is no technical change in this proposal. It is just moving the table to the proper section of the code.

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

The code requirements will not change with this proposal.

Internal ID: 368

FS19-18

IBC: 705.6 (New), 705.7

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.

Internal ID: 362

FS20-18

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

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.

Internal ID: 437

FS21-18

IBC: 705.10 (New)

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.

Internal ID: 318

FS22-18

IBC: 706.1.1

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.

Internal ID: 2389

FS23-18

IBC: 706.5, 706.5.1 (New), 706.5.2 (New), 706.5.1

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 ¾ 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

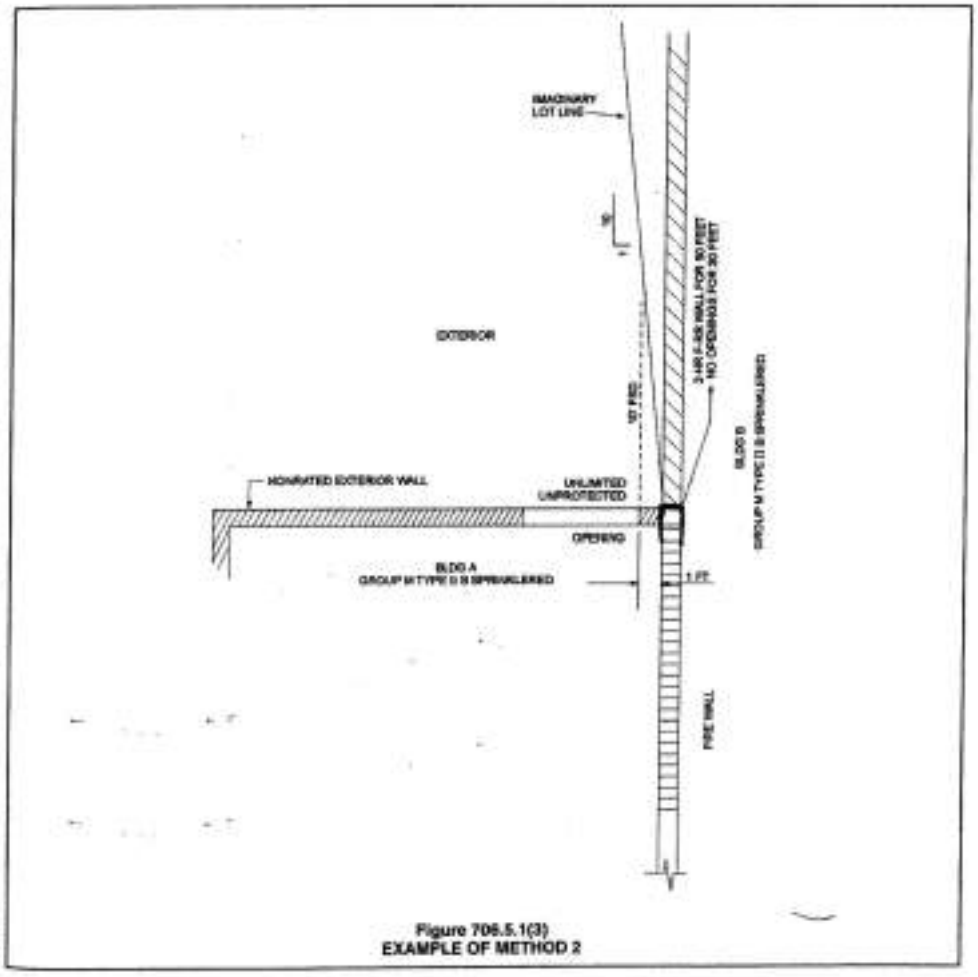


Figure 706.5.1(3)
EXAMPLE OF METHOD 2

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.

Internal ID: 845

FS24-18

IBC: 706.6.1

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.

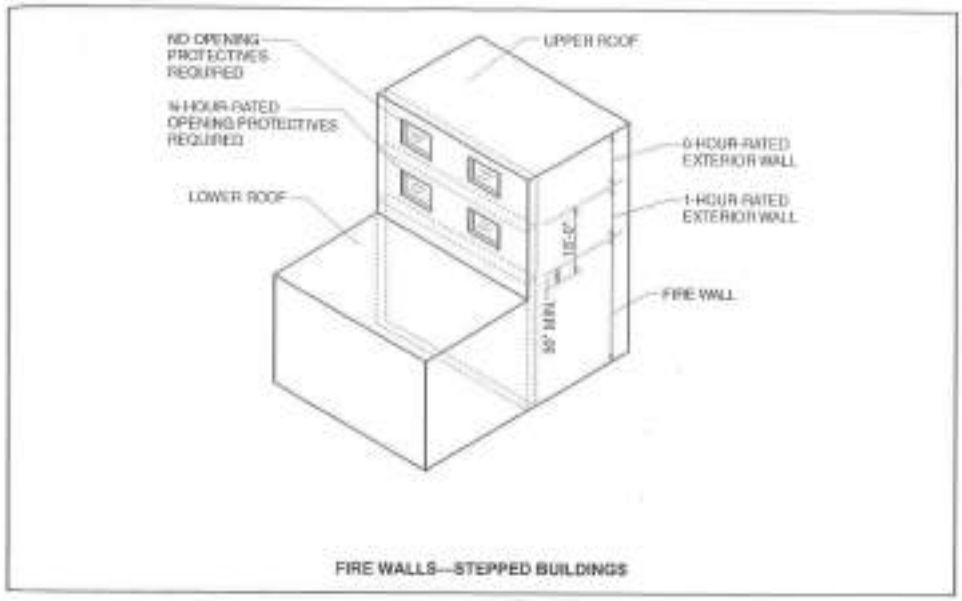
~~2.~~3. Openings in the lower roof shall not be located within 10 feet (3048 mm) of the *fire wall*.

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

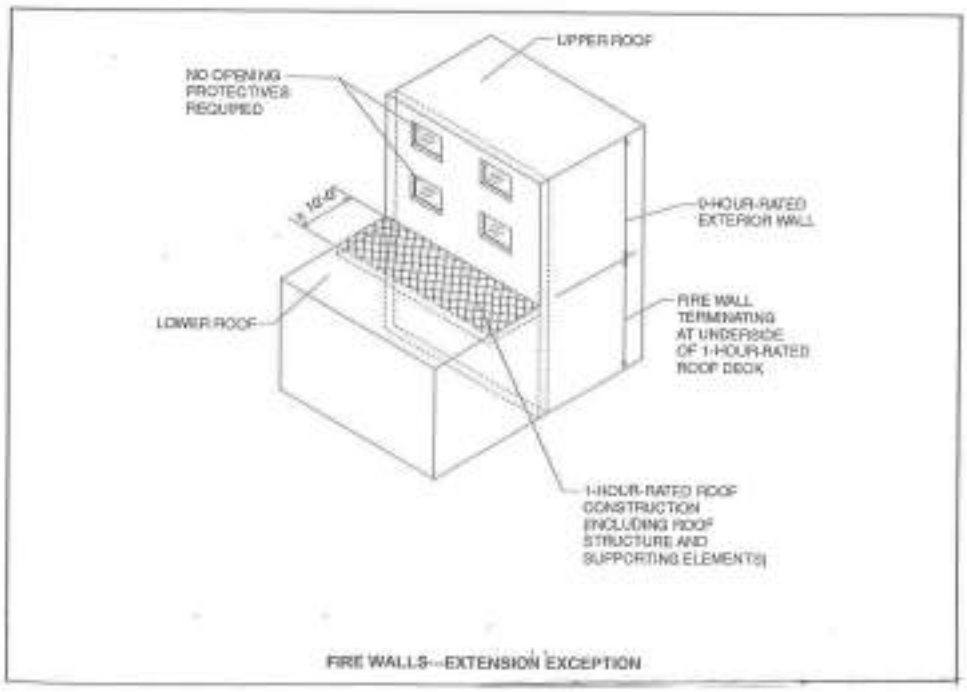
Reason:

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.

Internal ID: 88

FS25-18

IBC: 706.8 (New), 704.11

Proponent: Jonathan Siu, City of Seattle Department of Construction and Inspections, representing Washington Association of Building Officials Technical Code Development Committee (Jon.Siu@seattle.gov)

2018 International Building Code

Add new text as follows:

706.8 Supporting construction. The supporting construction for a fire wall shall be protected to afford the required fire resistance rating of the fire wall supported. Hollow vertical spaces within a fire wall shall be fireblocked in accordance with Section 718.2 at every floor level.

Revise as follows:

704.11 Bottom flange protection. Fire protection is not required at the bottom flange of lintels, shelf angles and plates, spanning not more than 6 feet 4 inches (1931 mm) whether part of the primary structural frame or not, and from the bottom flange of lintels, shelf angles and plates not part of the structural frame, regardless of span. Fire protection shall be provided at the bottom flange of lintels, shelf angles and plates, spanning more than 6 feet 4 inches, where they support fire wall or fire barrier construction.

Reason:

This proposal is intended to clarify the requirements for structural members, including lintels and similar members, supporting fire walls.

New Section 706.8 regarding supporting construction for fire walls:

As currently written, the code does not specify what level of fire resistance rating is required for structural members supporting fire walls. There are requirements for supporting construction for fire barriers and horizontal assemblies in Sections 707.5.1 and 711.2.3, but none for fire walls. This leaves the code requirement open to interpretation--is supporting construction part of the fire wall and protected accordingly, or is it part of the structural frame, or can it be unprotected because the code doesn't specifically require protection?

The last two interpretations can result in unprotected construction supporting a fire wall above. Particularly regarding primary or secondary structural frame, a beam supporting a fire wall above an opening may not be "structural frame" if the fire wall is not a bearing wall. This seems to be inconsistent with the requirements for structural stability of the fire wall in Section 706.2, as wall as the requirements to protect supporting construction for fire barriers and horizontal assemblies. Note that the lack of the requirement in fire walls versus the specific requirement in fire barriers and horizontal assemblies is used as an argument that the code writers deliberately omitted the requirement for fire walls.

The assumption may be that a fire wall is continuous from foundation to roof, but the code allows large openings up to 156 square feet in fire walls (Section 706.8). A beam supporting fire wall construction above a 12-foot high opening could have an unprotected 13-foot span. Some jurisdictions may be able to get protection for that beam by calling it part of the fire wall, but that is arguable.

This proposed code change addresses the issue by inserting a new section into Section 706 to clarify construction must have the same fire resistance rating as the fire wall it structurally supports. The proposed text is identical to the language currently used for fire barriers in Section 707.5.1, including the requirement for fireblocking at floors. We evaluated the exceptions in Sections 707.5.1 and 711.2.3 (parallel requirement for horizontal assemblies), and determined that none were applicable to fire walls, as they relate to providing separations between occupancies or incidental uses, or to other wall types.

Section 704.11 regarding lintels, shelf angles, and plates:

While the online Merriam-Webster dictionary broadly defines a lintel as "a horizontal architectural member spanning and usually carrying the load above an opening," our experience is the terms "lintels, shelf angles, or plates" as used in this section are generally intended to be used in the context of supporting concrete or masonry materials above.

As written, this section requires protection for the bottom flange of these members if they span more than 6'-4" and are part of the primary or secondary structural frame. However, if a concrete or masonry fire wall or fire barrier is not also a bearing wall, it is questionable whether this section applies, since these members can be interpreted as being neither primary nor secondary structural frame. This then leaves it open to interpretation whether fire protection is required for a lintel supporting concrete or masonry in a non-bearing fire wall or fire barrier.

This proposal clarifies lintels, shelf angles, or plates spanning more than 6'-4" must be protected if they support fire wall or fire barrier construction.

Related code change proposal:

A separate but related code change proposal has been submitted to clarify requirements for supporting bearing walls. If this proposal and the bearing wall proposal both pass, the combined Section 704.11 can appear as follows:

704.11 Lintels, shelf angles, and plates. Fire protection shall be provided at the bottom flange of lintels, shelf angles and plates, where they span more than 6 feet 4 inches (1931 mm) and meet at least one of the following conditions:

1. They are an element of the structural frame, or

2. They support fire wall or fire barrier construction.

Cost Impact

The code change proposal will increase the cost of construction .

Because this is a clarification of the current code language, the impact on cost of construction will depend on how a local jurisdiction is interpreting the current code provisions. If the jurisdiction is requiring fire resistance ratings consistent with the fire resistance rating of fire walls, there will be no change in the cost of construction. However, if the jurisdiction is applying the code literally, this proposal could result in increased cost for fireproofing of beams or some lintels providing structural support for non-bearing fire walls or fire barriers.

Internal ID: 630

FS26-18

IBC: 707.4, TABLE 716.1(2), TABLE 716.1(3), 716.2.5.4.1 (New), 716.3.2.1.1.1 (New)

Proponent: Robert Davidson, Davidson Code Concepts, LLC, representing Tesla USA/Safti First (rjd@davidsoncodeconcepts.com)

2018 International Building Code

Revise as follows:

707.4 Exterior walls. Where exterior walls serve as a part of a required fire-resistance-rated shaft or stairway or ramp enclosure, or separation, such walls shall comply with the requirements of Section 705 for exterior walls and the fire-resistance-rated enclosure or separation requirements shall not apply.

~~Exception~~Exceptions:

1. Exterior walls required to be *fire-resistance rated* in accordance with Section 1021 for exterior egress balconies, Section 1023.7 for interior exit stairways and ramps and Section 1027.6 for exterior exit stairways and ramp.
2. Exterior walls required to be *fire-resistance rated* in accordance with Section 1206 of the International Fire Code for enclosure of energy storage systems.

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-resistance rating of 1 hour: Enclosures for shafts, 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	$^3/_4$[f]		D-H[f]	
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	1 0.5	$^3/_4$ $^1/_3$	Maximum size tested Maximum size tested	D-H-45 D-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[f]	2	D-H-OH-90[f]	W-120
					Fire protection			
	1	$^3/_4$	Maximum size tested	D-H-45	3/4[f]		D-H-45[f]	
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. Fire-protection-rated glazing is not permitted for fire barriers required by Section 1206 of the International Fire Code to enclose energy storage systems. Fire-resistance-rated glazing assemblies tested to ASTM E119 or UL 263, as specified in Section 716.1.2.3 shall be permitted.

TABLE 716.1(3)
FIRE WINDOW ASSEMBLY FIRE PROTECTION RATINGS

TYPE OF WALL ASSEMBLY	REQUIRED WALL ASSEMBLY RATING (hours)	MINIMUM FIRE WINDOW ASSEMBLY RATING (hours)	FIRE-RATED GLAZING MARKING
Interior walls			
Fire walls	All	NP[a]	W-XXX[b]
Fire barriers	>1	NP[a]	W-XXX[b]
	1	NP[a]	W-XXX[b]
Atrium separations (Section 707.3.6),	1	$^3/_4$	OH-45 or W-60
Incidental use areas (Section 707.3.7) [c]			
Mixed occupancy separations (Section 707.3.9)			
Fire partitions	1	$^3/_4$	OH-45 or W-60
	0.5	$^1/_3$	OH-20 or W-30
Smoke barriers	1	$^3/_4$	OH-45 or W-60
Exterior walls	>1	$1^1/_2$	OH-90 or W-XXX[b]
	1	$^3/_4$	OH-45 or W-60
	0.5	$^1/_3$	OH-20 or W-30
Party wall	All	NP	Not Applicable

NP = Not Permitted.

a. Not permitted except fire-resistance-rated glazing assemblies tested to ASTM E119 or UL 263, as specified in Section 716.1.2.3.

b. XXX = The fire rating duration period in minutes, which shall be equal to the fire-resistance rating required for the wall assembly.

c. Fire-protection-rated glazing is not permitted for fire barriers required by Section 1206 of the International Fire Code to enclose energy storage systems. Fire-resistance-rated glazing assemblies tested to ASTM E119 or UL 263, as specified in Section 716.1.2.3 shall be permitted.

716.2.5.4 Fire door frames with transom lights and sidelights. Fire-protection-rated glazing shall be permitted in door frames with transom lights, sidelights or both, where a 3/4-hour *fire protection rating* or less is required and in 2-hour fire-resistance-rated exterior walls in accordance with Table 716.1(2). *Fire door* frames with transom lights, sidelights, or both, installed with fire-resistance-rated glazing tested as an assembly in accordance with ASTM E119 or UL 263 shall be permitted where a *fire protection rating* exceeding $^3/_4$ hour is required in accordance with Table 716.1(2).

Add new text as follows:

716.2.5.4.1 Energy storage system separation. Fire-protection-rated glazing shall not be permitted in fire door frames with transom lights and sidelights in fire barriers required by Section 1206 of the International Fire Code to enclose energy storage systems.

716.3.2.1 Interior fire window assemblies. Fire-protection-rated glazing used in fire window assemblies located in fire partitions and fire barriers shall be limited to use in assemblies with a maximum fire-resistance rating of 1 hour in accordance with this section.

716.3.2.1.1 Where 3/4-hour-fire-protection window assemblies permitted. Fire-protection-rated glazing requiring 45-minute opening protection in accordance with Table 716.1(3) shall be limited to fire partitions designed in accordance with Section 708 and fire barriers utilized in the applications set forth in Sections 707.3.6, 707.3.7 and 707.3.9 where the fire-resistance rating does not exceed 1 hour. Fire-resistance-rated glazing assemblies tested in accordance with ASTM E119 or UL 263 shall not be subject to the limitations of this section.

716.3.2.1.1.1 Energy storage system separation. Fire-protection-rated glazing is not permitted for use in fire window assemblies in fire barriers required by Section 1206 of the International Fire Code to enclose energy storage systems.

Reason:

Battery storage systems, now referred to as Energy Storage Systems, have historically been separated from other portions of an occupancy by one or two hour fire-resistance-rated construction as an Incidental Use. The enclosure protects the general occupancy areas from an event involving the Incidental Use.

One of the hazards of an energy storage system is thermal runaway leading to a fire event. These fire events can be significant and last several hours. The systems are required to be designed to prevent thermal runaway internally, however, thermal runaway can be induced in some case by an exterior event such as a damaging impact or from a fire exposure. Though the code now requires fire suppression of the space occupied by the energy storage system, the remainder of the occupancy may not be protected and the current code language allows the use of fire-protection-rated glazing material in door and window openings.

Fire-protection-rated glazing is intended to stop spread of flame and smoke, but not radiant heat. The radiant heat flow through the glazing is significant, enough to cause a fire on the other side of the fire-resistance-rated separation assembly, and, specific to this issue, induce thermal runaway of the energy storage system. (See the included Intertek test report and heat transmittal through ceramic fire-protection-rated glazing with a revision date of May 13, 2016.)

https://www.dropbox.com/sh/n8h65nht5dcruq5/AAAZxIS4ioKu_eTXz1GqjwQ3a?dl=0

A large part of the new requirements in the International Fire Code targeting energy storage systems and in the currently in cycle NFPA 855 Energy Storage Systems Standard is protecting the energy storage system from exposure hazards to the system. This proposal builds on that part of the protection to the systems by prohibiting the use of fire-protection-rated glazing in one hour assemblies that are used to enclose energy storage systems.

Cost Impact

The code change proposal will increase the cost of construction .

The increase in cost of construction is specific to energy storage system and is negligible compared to the overall cost of compliance when installing energy storage systems.

Internal ID: 1872

FS27-18

IBC: 707.5

Proponent: David Renn, City and County of Denver, representing Code Change Committee of Colorado Chapter of the ICC (david.renn@denvergov.org)

2018 International Building Code

Revise as follows:

707.5 Continuity. *Fire barriers* shall extend from the top of the foundation or floor/ceiling assembly below to the underside of the floor or roof sheathing, slab or deck above and shall be securely attached thereto. Such *fire barriers* shall be continuous through concealed space, such as the space above a suspended ceiling. Joints and voids at intersections shall comply with Sections 707.8 and 707.9

Exceptions:

1. Shaft enclosures shall be permitted to terminate at a top enclosure complying with Section 713.12.
2. *Interior exit stairway* and *ramp* enclosures required by Section 1023 and *exit access stairway* and *ramp* enclosures required by Section 1019 shall be permitted to terminate at a top enclosure complying with Section 713.12.
3. An exit passageway enclosure required by Section 1024.3 that does not extend to the underside of the roof sheathing, slab or deck above shall be enclosed at the top with construction of the same fire-resistance rating as required for the exit passageway.

Reason:

Exception 2 currently allows interior exit stairway and ramp enclosures to terminate at a top enclosure meeting the requirements for a top enclosure of a shaft. This proposed change extends this same allowance to exit passageways. Since exit passageways and interior exit stairways and ramps are all exit components, the current allowance for a top enclosure should apply to all of these components. Since an exit passageway does not penetrate a floor as shaft does, this proposal includes this allowance as a new exception, rather than referring to top enclosure requirements for shafts.

The use of a fire-resistance rated top enclosure for an exit passageway is commonly used as a means to allow mechanical, electrical and plumbing work to route above an exit enclosure. This proposal would specifically allow what is currently allowed by many jurisdictions through the modifications provisions in IBC 104.10.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

There is no change to construction cost since this new exception is not required to be used. If used, there is a cost trade off between extending fire barriers to the roof, sheathing, slab or deck and providing the top enclosure. Savings in mechanical, electrical or plumbing systems may be realized by routing over an exit passageway instead of around an exit passageway.

Internal ID: 1226

FS28-18

IBC: 707.5.1

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

2018 International Building Code

Revise as follows:

707.5.1 Supporting construction. The supporting construction for a *fire barrier* shall be protected to afford the required *fire-resistance rating* of the *fire barrier* supported. Hollow vertical spaces within a *fire barrier* shall be fireblocked in accordance with Section 718.2 at every floor level.

Exceptions:

1. The maximum required *fire-resistance rating* for assemblies supporting *fire barriers* separating tank storage as provided for in Section 415.9.1.2 shall be 2 hours, but not less than required by Table 601 for the building construction type.
2. Supporting construction for 1-hour *fire barriers* required by Table 509 in buildings of Types IIB, IIIB and VB construction is not required to be *fire-resistance rated* unless required by other sections of this code.
3. Supporting construction for 2-hour interior exit stairways and ramps shaft enclosure of Section 1023.2, is not required to exceed the ratings given in Table 601 unless required by other sections of this code.

Reason:

One hour buildings and 2-hour shafts. Shaft walls are officially fire barriers. Therefore, some jurisdictions require that elevator and stairs hafts in Type IIA, IIIA and VA four story buildings need to have their shafts supported by a structural system that complies with 2-hour fire resistance. This is questionable logic. This means that the code allows the building to completely fall down after a 1 hour fire but the code wants the shaft to remain standing among the rubble? I have always thought of this as odd, and not very practical to design or construct, and not very defensible from a logical point of view.

Cost Impact

The code change proposal will decrease the cost of construction .

This code change will decrease the cost of construction.

If this proposal is approved, the required fire rating of the supporting structure could be reduced and as the result cost of construction can be decreased.

Internal ID: 1524

FS29-18

IBC: 707.8, 707.9

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.

Internal ID: 300

FS30-18

IBC: 202 (New), 202, 707.9, 715.5 (New), Chapter 35

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 and floors 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 or floor 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:

715.5 Voids at intersection of fire barriers and underside of nonfire-resistance-rated roofs and floors. The voids created at the intersection of a fire barrier and the underside of a nonfire-resistance-rated roof or floor sheathing, slab or deck above shall be protected 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 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

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Reason:

Section 707.9 of the 2012 and later editions of the International Building Code have a provision whereby 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 filled with an approved material or system. This proposal is intended to introduce similar requirements for the void created at the intersection of a fire barrier and the underside of a nonfire-resistance-rated floor sheathing, slab or deck. The language proposed gives an option to fill the void with an approved material, or to protect it with a continuity head-of-wall joint system tested to a new Standard ASTM E2837, entitled “Standard Test

Method for Determining the Fire Resistance of Continuity Head-of-Wall Joint Systems Installed Between Rated Wall Assemblies and Nonrated Horizontal Assemblies". Since there are a limited number of published systems at this time, the use of a tested system is being proposed as an option to the allowance of an approved material or system. At some later date, when more tested systems are available, the code language can be revised once again to mandate tested systems in much the same way systems tested to ASTM E1966 or UL 2079 are mandated for rated-to-rated construction.

This proposal also parallels another proposal which introduces the new ASTM standard for use with the void at the intersection of a fire barrier and a nonfire-resistance-rated roof assembly. This proposal incorporates the required changes relating to both the roof and the floor intersections. If both proposals are approved as submitted, the language of this proposal prevails as it incorporates the required changes for voids beneath both roofs and floors.

The proposal also 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 increase the cost of construction .

If approved this proposal will mandate protection of voids which do not require protection by the 2018 IBC.

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.

Internal ID: 330

FS31-18

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

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

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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.

Internal ID: 326

FS32-18

IBC: 708.1

Proponent: Sarah Rice, representing Myself (srice@preview-group.com)

2018 International Building Code

Revise as follows:

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

1. Separation walls as required by Section 420.2 for Group I-1 and Group R occupancies.
2. Walls separating tenant spaces in *covered and open mall buildings* as required by Section 402.4.2.1.
3. Corridor walls as required by Section 1020.1.
4. Enclosed elevator lobby separation as required by Section 3006.2.
5. Egress balconies as required by Section 1021.2
6. Walls separating ambulatory care facilities from adjacent spaces, corridors or tenants as required by Section 422.2

Reason:

Section 708.1 provides a list of the locations where fire partitions are required in the IBC. Missing from the list is the requirement found in Section 422.2 to separate ambulatory care facilities from adjacent spaces. This code change simply brings that requirement into the list.

IBC Section 422.2 reads:

422.2 Separation. Ambulatory care facilities where the potential for four or more care recipients are to be incapable of self-preservation at any time shall be separated from adjacent spaces, corridors or tenants with a fire partition installed in accordance with Section 708.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

The code change is simply a correlation.

Internal ID: 2373

FS33-18

IBC: 708.1

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

2018 International Building Code

Revise as follows:

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

1. Separation walls as required by Section 420.2 for Group I-1 and Group R occupancies.
2. Walls separating tenant spaces in *covered and open mall buildings* as required by Section 402.4.2.1.
3. Corridor walls as required by Section 1020.1.
4. Enclosed elevator lobby separation as required by Section ~~3006.2.~~3006.3.
5. Egress balconies as required by Section 1021.2
6. Walls separating ambulatory care facilities from adjacent spaces, corridors or tenants as required by Section 422.2.
7. Walls separating individual sleeping units and contiguous attic and crawl spaces to those units are separated from each other and public or common areas as required by Sections 907.2.8.1, 907.2.9.1 and 907.2.10.1.
8. Walls separating vestibules from a level of exit discharge as required by Section 1028.1.

Reason:

Section 708.1 describes the application of fire partitions as required by other sections of the code. This list has become outdated over time. This proposal updates this list by adding the additional sections which require walls to be constructed as fire partitions.

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.

Internal ID: 331

FS34-18

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

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.

Internal ID: 1597

FS35-18

IBC: 708.3, 711.2.4.3

Proponent: William Hall, Portland Cement Association, representing Alliance For Concrete Codes and Standards (jhall@cement.org); Jason Thompson, National Concrete Masonry Association, representing Masonry Alliance for Codes and Standards (jthompson@ncma.org)

2018 International Building Code

Revise as follows:

708.3 Fire-resistance rating. *Fire partitions* used to separate *dwelling units and sleeping units* shall have *fire-resistive ratings* of not less than 2 hours. Other *fire partitions* shall have a *fire-resistance rating* of not less than 1 hour.

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.

711.2.4.3 Dwelling units and sleeping units. *Horizontal assemblies* serving as dwelling or sleeping unit separations in accordance with Section 420.3 shall be not less than ~~1~~2-hour *fire-resistance-rated* construction.

Exception: *Horizontal assemblies* separating *dwelling units* and *sleeping units* shall be not less than 1~~/2~~-hour fire-resistance-rated construction in a building of Types ~~IIB~~ II, III, ~~IIIB~~ IV and ~~VB~~ V construction, where the building is equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1.

Reason:

Reductions in passive fire protection, especially between dwelling units has long been a concern of our members and allies. Our fears are unfortunately coming true as the U.S. is beginning to see occupied structures with sprinkler protection experiencing substantial or complete burn out as well as deaths and injuries. Westchester, PA 4 seniors killed, Chesapeake, VA 3 killed, Evans, GA 1 killed. Survivors are forced to re-locate and start over. See attachment for complete list.

This proposal returns the requirement for a 2- hour fire rating between dwelling and sleeping units while still recognizing the increased reliability of NFPA 13 systems. We feel this is a good compromise to return a level of redundancy into the code for our citizens who depend on this code for not only life safety but also for property protection within their space they call home. The requirements in this proposals can easily be met by any of the material industries. Note that this requirement is applicable to all construction types except for Type I horizontal assemblies. Type I requires a 2 hour floor rating regardless. Because of that, including Type I in the 711.2.4.3 would result in a reduction of hourly rating and reduction in safety.

In a perfect world we could all rely on active fire suppression systems and that proper maintenance and monitoring would occur, the system will always suppress the fire regardless of added obstructions. That simply is not the case. We live in a world where many times Murphy's Law presides and if the chance exists it can and will happen. Providing a 2 hour or 1 hour in the case of NFPA 13, will enhance the structures ability to withstand fire and provide more time for residents to recognize the emergency and escape and fire service personnel to perform recovery operations.

Cost Impact

The code change proposal will increase the cost of construction .

The added cost will typically be limited to providing an additional layer of type x gypsum to each side of the wall assembly or ceiling assembly serving as the dwelling unit separation.

Internal ID: 618

FS36-18

IBC: 708.4

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. <u>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.</u>

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	

Internal ID: 130

FS37-18

IBC: 708.4.1

Proponent: Sarah Rice, representing Myself (srice@preview-group.com)

2018 International Building Code

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 *fire partitions* separating tenant spaces in covered and open mall buildings, *fire partitions* separating dwelling units, *fire partitions* separating sleeping units, fire partitions separating ambulatory care facilities from adjacent spaces or corridors, and *fire partitions* serving as corridor walls.

Reason:

When the CTC Working Group on ambulatory care put together what is now Section 422, the correlative changes appropriate for fire partitions were not made. This code change brings in those changes.

Currently the IBC literally requires the supporting construction for fire partitions in Type IIB, IIIB and VB construction used to separate ambulatory care facilities to be fire rated the same as the wall.

Cost Impact

The code change proposal will decrease the cost of construction .

Currently there is no exception for the supporting construction of fire partitions separating ambulatory care facilities from other areas, thus it is literally required to be fire rated. Providing the exception reduces cost through fewer materials in the supporting construction.

Internal ID: 2375

FS38-18

IBC: SECTION 202, 202, 709.4.1

Proponent: John Williams, Chair, representing Healthcare Committee (AHC@iccsafe.org); Michael O'Brian, Chair, representing FCAC (fcac@iccsafe.org)

2018 International Building Code

SECTION 202 DEFINITIONS

Revise as follows:

[BG] SMOKE COMPARTMENT. A space within a building ~~enclosed by *smoke barriers* on all sides, including the top and bottom.~~separated from other interior areas of the building by smoke barriers, including interior walls and horizontal assemblies.

709.4.1 Smoke-barrier ~~walls~~ assemblies separating smoke compartments. *Smoke-barrier* ~~walls~~ assemblies used to separate *smoke compartments* shall form an effective membrane enclosure that is continuous from outside wall or smoke barrier wall to outside wall or another smoke barrier wall and horizontal assemblies.

Reason:

Modification of the definition is better describing the intent and means of defining the smoke compartment. It further clarifies that the separation is to occur between interior areas of the building and not require a roof or exterior wall to meet the requirements of a smoke barrier.

Proposed modifications to Section 709.4.1 reflect that smoke barriers used for creating smoke compartments and separating them from other interior areas of the building, is not accomplished by just walls, but horizontal assemblies may also be required. The use of vertical and horizontal components is clearly noted in Sections 709.1 and 711.2.4.4. Changing that smoke barrier walls can “begin and end” at another smoke barrier wall, instead of just outside wall to outside wall provides an increase design flexibility in all types of care facilities. It also is comparable to the language for separation of areas of refuge and elevator lobbies in Section 709.4.2.

This proposal is submitted by the ICC Fire Code Action Committee (FCAC). and ICC Committee on Healthcare (CHC).

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/

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 decrease the cost of construction .

Proposed changes will reduce the cost of construction as exterior walls and roofs will no longer need to perform as “smoke barrier assemblies” as the present language has been interpreted to require. It also eliminates the need for smoke barrier walls to be constructed through the building to an outside wall. Potentially increasing the size of the smoke compartment and creating an increase in the construction of mechanical systems that could have been outside of the space if the walls would have been permitted to terminate at another smoke barrier instead of an outside wall.

Internal ID: 605

FS39-18

IBC: 710.5, 710.5.3 (New)

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.

Internal ID: 604

FS40-18

IBC: 713.4

Proponent: Jeffrey Hugo, representing National Fire Sprinkler Association (hugo@nfsa.org)

2018 International Building Code

Revise as follows:

713.4 Fire-resistance rating. Shaft enclosures shall have a *fire-resistance rating* of not less than 2 hours where connecting four *stories* or more, and not less than 1 hour where connecting less than four *stories*. The number of *stories* connected by the shaft enclosure shall include any basements but not any *mezzanines*. Shaft enclosures shall have a *fire-resistance rating* not less than the floor assembly penetrated, but need not exceed 2 hours. Shaft enclosures shall meet the requirements of Section 703.2.1.

Exception: For buildings with automatic sprinkler systems in accordance with 903.3.1.1, not greater than 420 feet (128 m) in building height, the required fire-resistance rating of the fire barriers enclosing vertical shafts, other than interior exit stairways and elevator hoistways, shall not be less than 1 hour where automatic sprinklers are installed within the shafts at the top and alternate floors. Each floor throughout the building shall be equipped with sprinkler control valves equipped with supervisory initiating and water-flow initiating devices.

Reason:

The text of the new exception to IBC Section 713.4, comes from IBC Section 403.2.1.2. Section 403.2.1.2 allows shafts in high-rises (over 75 ft in height) up to 420 feet in height to have a 1-hour rating where the building is fully sprinklered, with sprinklers at the top of the shaft and alternating floor levels. Each floor has a supervised floor control valves and water flow switches. This proposals extends the same requirement to all shafts (except stairs and elevators) of any building. This exception would only apply to NFPA 13 sprinklered buildings, with the addition of supervised floor control valves, water flow switches and sprinklers at the top of the shaft and at each alternate level. NFPA 13 does not require low-rise buildings to be equipped with floor control valves on each floor (NFPA 13, 8.2.4) and shafts with noncombustible or limited-combustible (gypsum board) surfaces are not required to have sprinklers (NFPA 13 8.15.2).

The high-rise shaft reduction language can be traced back to the 1990 BOCA code. There are no records of adverse or failures of the active or passive measures when this reduction is used. It can be reasoned that a 76 ft building (a high-rise) can have sprinklered 1-hr shafts whereas a 75 ft building (not a high-rise) would be required to have 2-hr shafts without the codified option or exception to allow a reduction for sprinklers.

Cost Impact

The code change proposal will increase the cost of construction .

This proposal correlates the requirement for high-rise shaft rating reduction to all shafts. To obtain the reduction for buildings under 75 ft, an automatic sprinkler system per NFPA 13 is required, as well as supervised floor control valves, water flow switches and sprinklers at the top of the shaft and at each alternating level. A low-rise building (2-4 stories) can be sprinklered without supervised floor control valves, water-flow for each floor. This text provides an option to a building designer and owner where the additional expense warrants a reduction in shaft rating.

Internal ID: 1230

FS41-18

IBC: 713.12

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:

713.12 Enclosure at top. ~~A shaft enclosure that does not~~ The top of shaft enclosures shall comply with one of the following:

1. They shall extend to the underside of the roof sheathing, deck or slab of the building and the roof assembly shall comply with the requirements for the type of construction as specified in Table 601.
2. They shall terminate below the roof assembly and be enclosed at the top with construction of the same fire-resistance rating as the topmost floor penetrated by the shaft, but not less than the fire-resistance rating required for the shaft enclosure.
3. They shall extend past the roof assembly and comply with the requirements of Section 1510.

.

Reason:

The current phrasing in this section can be confusing and it does not address one of the most common conditions at the top of a shaft enclosure. The previous section, 713.11 Enclosure at bottom, identifies the most common conditions at the bottom of a shaft enclosure and clearly lists the requirements for each condition. This proposed change to the Enclosure at top section aims to provide the same level of detail and organization as the Enclosure at bottom section. This proposal does not result in a technical change to the code requirements, but it does attempt to make those requirements more clear.

Three different conditions are identified for the top of a shaft enclosure in this proposal - the shaft enclosure can 1) extend to the underside of the sheathing, 2) terminate below the roof assembly or 3) extend past the roof assembly. The requirements for conditions one and two can be inferred from the current code language. However, the requirements for the third condition are not currently identified in this section. When a shaft enclosure extends past the roof assembly, it would then meet the definition of a Penthouse and need to meet the requirements of section 1510 Rooftop Structures. It is a common condition for elevator shafts to extend past the roof and it deserves mention in section 713.12 Enclosure at top. The proposal adds this third condition and includes a reference to section 1510 Rooftop Structures. Additionally, the first condition (where a shaft enclosure extends to the underside of the sheathing) has been expanded to note that the roof must meet the requirements for the type of construction specified.

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 does not result in a technical change to the code requirements but does make some of those requirements more clear. Since these requirements are already part of the code, it is not likely that there will be an increase or decrease in the cost of construction.

Internal ID: 312

FS42-18

IBC: 713.12.1 (New)

Proponent: David Collins, The American Institute of Architects, representing The American Institute of Architects (dcollins@preview-group.com)

2018 International Building Code

713.12 Enclosure at top. A shaft enclosure that does not extend to the underside of the roof sheathing, deck or slab of the building shall be enclosed at the top with construction of the same *fire-resistance rating* as the topmost floor penetrated by the shaft, but not less than the *fire-resistance rating* required for the shaft enclosure.

Add new text as follows:

713.12.1 Penthouse mechanical rooms. A fire/smoke damper shall not be required at the penetration of the rooftop structure where shaft enclosures extend up through the roof assembly into a rooftop structure conforming to Section 1510. All ductwork in the shaft shall be connected directly to HVAC equipment.

Reason:

The code includes provisions for termination of a shaft at the bottom and a shaft that terminates short of the roof assembly, but provides no guidance for a shaft that penetrates a roof structure. This change will clearly allow a shaft to terming above the roof and ducts to connect the shaft to the HVAC equipment without any additional protection at the penetration of the roof when it is inside a rooftop structure permitted by Section 1510.

Cost Impact

The code change proposal will decrease the cost of construction .

By clarifying how shafts are terminated at the top should reduce the cost of construction, confusion and unnecessary installation of dampers. Criteria for shutdown of systems by detectors and dampers are found in the IMC and would suffice where the ductwork in the shaft connect to to that equipment.

Internal ID: 1753

FS43-18

IBC: 713.13, 713.13.1

Proponent: Lawrence Lincoln, Salt Lake City Corporation, representing self (larry.lincoln@slcgov.com)

2018 International Building Code

Revise as follows:

713.13 Waste and linen chutes and incinerator rooms. Waste and linen chutes shall comply with the provisions of NFPA 82, Chapter 6 and shall meet the requirements of Sections 712 and 713.13.1 through 713.13.6. Incinerator rooms shall meet the provisions of Sections 713.13.4 through 713.13.5.

~~Exception~~ Exceptions:

1. Chutes serving and contained within a single dwelling unit.
2. Doors between the chute discharge and the discharge room shall not be required.

713.13.1 Waste and linen. A shaft enclosure containing a recycling, or waste or linen chute shall not be used for any other purpose and shall be enclosed in accordance with Section 713.4. A shaft enclosure shall be permitted to contain recycling and waste chutes. Openings into the shaft, from access rooms ~~and discharge rooms~~, shall be protected in accordance with this section and Section 716. Openings into chutes shall not be located in *corridors*. Doors into chutes shall be self-closing. ~~Discharge doors shall be self-or automatic-closing upon the actuation of a smoke detector in accordance with Section 716.2.6.6, except that heat-activated closing devices shall be permitted between the shaft and the discharge room.~~

Reason:

Why is the IBC requiring waste and linen chute discharge doors to be fire-rated when the chute itself is not required to be fire-rated? As it is written, IBC code section 713.13 is trying to protect a building component (the chute) which is not a fundamental building element of construction. (See illustration). The addition of exception #2 eliminates the requirement of the chute discharge doors in its entirety along with the fire-rating as required by NFPA 82, Chapter 6. It is not the intention of this exception to eliminate NFPA 82, Chapter 6 in its entirety but only that portion of NFPA 82, Chapter 6 that requires the chute discharge doors and its fire rating. (See IBC section 102.4.1 concerning 'Conflicts' between referenced codes and standards, and the code. It indicates that the provisions of the code shall apply).

The strikeout of the words 'and discharge rooms' in section 713.13.1 eliminates the requirement for any type of fire-rated door at the bottom of the shaft where the shaft connects to the discharge room. IBC section 713.13.4 already requires that the waste and linen discharge room have the same fire-rating as the shaft enclosure that contains the chute. If the shaft enclosure and the discharge room are required to have the same fire rating, where is the need for a fire-rated door at that location? There is no need, nor is there a need for a waste and linen chute discharge door, let alone a fire-rated waste and linen chute discharge door.

Cost Impact

The code change proposal will decrease the cost of construction .

This proposed code changes eliminates a requirement therefore it would decrease the cost of construction.

Internal ID: 1998

FS44-18

IBC: 713.13, 713.13.1, 713.13.3, 713.13.4

Proponent: Sarah Rice, The Preview Group, representing Myself (srice@preview-group.com)

2018 International Building Code

Revise as follows:

713.13 Waste, recycle and linen chutes and incinerator rooms. Waste, recycle and linen chutes shall comply with the provisions of NFPA 82, Chapter 6 and shall meet the requirements of Sections 712 and 713.13.1 through 713.13.6. Incinerator rooms shall meet the provisions of Sections 713.13.4 through 713.13.5.

Exception: Chutes serving and contained within a single dwelling unit.

713.13.1 Waste, recycle and ~~linen.~~linen chute enclosures. A shaft enclosure containing a recycling, or waste or linen chute shall not be used for any other purpose and shall be enclosed in accordance with Section 713.4. A shaft enclosure shall be permitted to contain recycling and waste chutes. Openings into the shaft, from access rooms and discharge rooms, shall be protected in accordance with this section and Section 716. Openings into chutes shall not be located in *corridors*. Doors into chutes shall be self-closing. Discharge doors shall be self-or automatic-closing upon the actuation of a smoke detector in accordance with Section 716.2.6.6, except that heat-activated closing devices shall be permitted between the shaft and the discharge room.

713.13.3 Chute access rooms. Access openings for waste, recycling or linen chutes shall be located in rooms or compartments enclosed by not less than 1-hour *fire barriers* constructed in accordance with Section 707 or *horizontal assemblies* constructed in accordance with Section 711, or both. Openings into the access rooms shall be protected by opening protectives having a *fire protection rating* of not less than $^3/_4$ hour. Doors shall be self- or automatic-closing upon the detection of smoke in accordance with Section 716.2.6.6. The room or compartment shall be configured to allow the access door to the room or compartment to close and latch with the access panel to the ~~refuse or laundry~~ chute in any position.

713.13.4 Chute discharge room. Waste, recycling or linen chutes shall discharge into an enclosed room separated by *fire barriers* with a *fire-resistance rating* not less than the required fire rating of the shaft enclosure and constructed in accordance with Section 707 or *horizontal assemblies* constructed in accordance with Section 711, or both. Openings into the discharge room from the remainder of the building shall be protected by opening protectives having a *fire protection rating* equal to the protection required for the shaft enclosure. Doors shall be self- or automatic-closing upon the detection of smoke in accordance with Section 716.2.6.6. Waste chutes shall not terminate in an incinerator room. Waste and linen rooms that are not provided with chutes need only comply with Table 509.

Reason:

Previous code changes introduced "recycling chutes" to Section 713.13.1, but not the parent section, Section 713.1, or the sections for chute access or chute discharge rooms.

With the desire to be more environmentally conscious, building owners are incorporating more "built-in" mechanisms to promote the recycling of materials, such as dedicated chutes for the ready disposal of recyclable materials.

This proposal is somewhat editorial in nature as it only seeks to add consistency between the section on chute design in 713.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

As the 2018 IBC specifically regulates the overall construction of recycling chutes in the same manner as waste or linen chutes, there should not be any increase in cost.

Internal ID: 2369

FS45-18

IBC: 713.13.1, 713.13.4

Proponent: Todd Snider, West Coast Code Consultants (WC3), representing Self (Todd@KimballEng.com)

2018 International Building Code

Revise as follows:

713.13.1 Waste and linen. A shaft enclosure containing a recycling, or waste or linen chute shall not be used for any other purpose and shall be enclosed in accordance with Section 713.4. A shaft enclosure shall be permitted to contain recycling and waste chutes. Openings into the shaft, from access rooms ~~and discharge rooms~~, shall be protected in accordance with this section and Section 716. Openings into the shaft from the discharge room shall be protected in accordance with NFPA 82, Chapter 6. Openings into chutes shall not be located in *corridors*. Doors into chutes shall be self-closing. Discharge doors shall be self-or automatic-closing upon the actuation of a smoke detector in accordance with Section 716.2.6.6, except that heat-activated closing devices shall be permitted between the shaft and the discharge room.

713.13.4 Chute discharge room. Waste or linen chutes shall discharge into an enclosed room separated by *fire barriers* with a *fire-resistance rating* not less than the required fire rating of the shaft enclosure and constructed in accordance with Section 707 or *horizontal assemblies* constructed in accordance with Section 711, or both. Openings into the discharge room from the remainder of the building and from the shaft shall be protected by opening protectives having a *fire protection rating* equal to the protection required for the shaft enclosure. Doors shall be self- or automatic-closing upon the detection of smoke in accordance with Section 716.2.6.6. Waste chutes shall not terminate in an incinerator room. Waste and linen rooms that are not provided with chutes need only comply with Table 509.

Reason:

Proposed revision to clarify the requirements for opening protection between the shaft and the chute discharge room and to revise to match the requirements of the NFPA 82 standard referenced in Section IBC 713.13. The code currently requires that openings between the shaft and the discharge room to be protected per IBC 716, this requirement is not clear in the language of the code in this section, additionally, the requirements of IBC 716 do not match the requirements of Section 6.3.2.1 of NFPA 82. IBC 716 requires a fire rated door which has a closer and latch that is fire tested. Section 6.3.2.1 of NFPA 82 requires an approved automatic closing or self-closing door or fire damper of construction that is equivalent to the opening fire protection rating for the chute. The factory listed chute doors at the discharge cannot meet the latch requirements for the tested assemblies per IBC 716.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

This change simply clarifies a requirement that is already exisiting.

Internal ID: 1276

FS46-18

IBC: SECTION 202, 202 (New), 714.2.1 (New)

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.

Internal ID: 2330

FS47-18

IBC: 714.2.1 (NEW), 715.2.1(NEW)

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

2018 International Building Code

Add new text as follows:

714.2 Installation. A listed *penetration firestop* system shall be installed in accordance with the manufacturer's installation instructions and the listing criteria.

714.2.1 Contractor qualifications. In buildings that are 420 feet. (128 m) or greater in building height, penetration firestop systems shall be installed by contractors qualified by Underwriters Laboratories (UL), Factory Mutual (FM), or an approved agency.

Exceptions:

1. Where the work is of a minor nature as approved by the building official.
2. Where the work is a repair or Alteration Level 1 as defined by the International Existing Building Code.

715.2 Installation. A *fire-resistant joint system* shall be securely installed in accordance with the manufacturer's installation instructions and the listing criteria in or on the joint for its entire length so as not to impair its ability to accommodate expected building movements and to resist the passage of fire and hot gases.

715.2.1 Contractor qualifications. In buildings that are 420 feet (128 m) or greater in building height, fire-resistant joint systems shall be installed by contractors qualified by Underwriters Laboratories (UL), Factory Mutual (FM) or an approved agency.

Exceptions:

1. Where the work is of a minor nature as approved by the building official.
2. Where the work is a repair or Alteration Level 1 as defined by the International Existing Building Code.

Reason:

There currently is a big risk with penetration firestop systems not installed to the listing or manufacturer's installation instructions. Building survey findings have shown installation deficiencies demonstrating a lack of knowledge regarding penetration firestop systems, lack of knowledge of the complex listings, and lack of knowledge regarding manufacturer's instructions. Also, a risk exists with fire-resistive joint systems not installed to the listing or the manufacturers installation instructions. Building survey findings identify installation deficiencies showing a lack of listing knowledge for these complex assemblies.

Requirements that penetration firestop systems and fire-resistive joint systems be installed by a FM 4991 Approved or UL Qualified Firestop Contractor means 3rd party exam and audit proven knowledge and processes exist to follow listings and manufacturers instructions. The FM 4991, Standard for the Approval of Firestop Contractors and UL Qualified Firestop Contractor Programs are similar to fabricator approval process in 1704.2.5.1 and manufacturers ISO 9000 quality management systems programs, but customized for the construction environment. The programs are administered by FM Approvals and UL, both independent of the Firestop Contractors International Association (FCIA) or firestop manufacturers, and the Contractors being audited. The programs verify that procedures for worker training, installation, review of installation, documentation or inventory of systems, and more, comply with program requirements and the contractor's quality management system procedures. A designated responsible individual implements the program at the firestop contractor company.

The initial cost to become FM 4991 Approved or UL Qualified ranges from $7000 to $12,000. An annual audit is required by the UL and FM programs which costs about $3,500. The contractor company spreads these costs amongst all their projects, meaning a small cost of doing business. Efficiencies gained from quality processes help offset the costs.

The current FM 4991 or UL Qualified Contractor list mirrors where these tall buildings are located. The contractors travel a region increasing availability providing competitive bidding to building owners and managers. Whereas it will be several years before this requirement would be in effect, there is plenty of time for other contractors to participate in the FM or UL programs.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

The firestop contractor that understands systems selection, analysis, the listings and manufacturers installation instructions gets the penetration firestop systems installed correctly the first time. The firestop contractor that does not know the industry protocol and installs 'fire caulk' and not systems is not providing the work result demanded by the code and will be non compliant. There are enough FM 4991 Approved and UL Qualified Firestop Contractors to provide a competitive environment for the general contractor and building owner and manager, and, should this be mandated, many more will appear.

Internal ID: 2243

FS48-18

IBC: 714.4.2

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</u>

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.

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 increase 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

Internal ID: 2095

FS49-18

IBC: 714.4.3, 714.5.3

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:

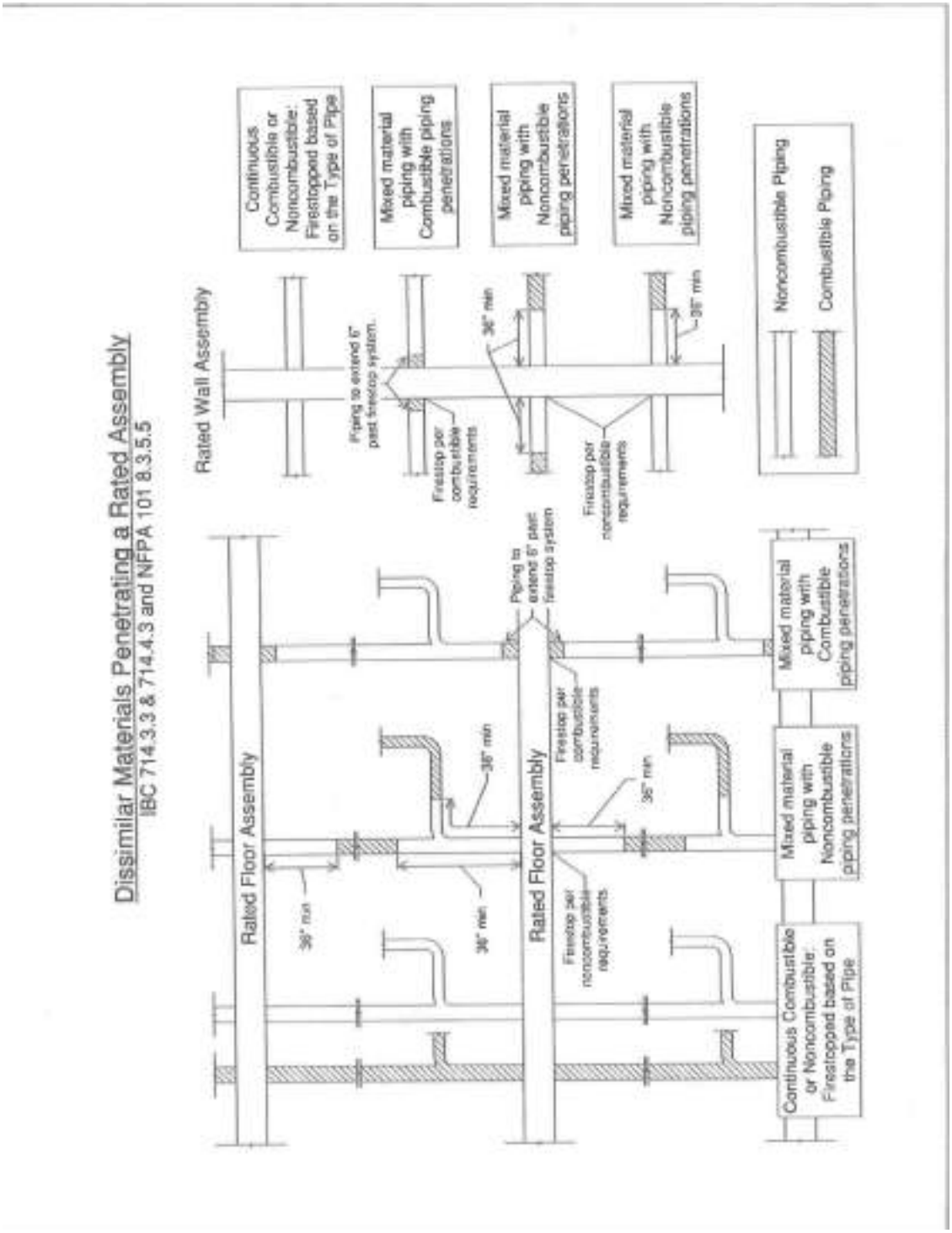
Many plumbing system installations involve the combined use of combustible and noncombustible piping, drains, waste and vents. For example, cast iron (noncombustible) drains may be used for sound control but plastic (combustible) vents are combined on each story for cost savings. The reason for these 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.

Internal ID: 97

FS50-18

IBC: 714.5.2

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

2018 International Building Code

Revise as follows:

714.5.2 Membrane penetrations. Penetrations of membranes that are part of a *horizontal assembly* shall comply with Section 714.5.1.1 or 714.5.1.2. Where floor/ceiling assemblies are required to have a *fire-resistance rating*, recessed fixtures shall be installed such that the required *fire resistance* will not be reduced.

Exceptions:

1. *Membrane penetrations* by steel, ferrous or copper conduits, pipes, tubes or vents, or concrete or masonry items where the *annular space* is protected either in accordance with Section 714.5.1 or to prevent the free passage of flame and the products of combustion. The aggregate area of the openings through the membrane shall not exceed 100 square inches (64 500 mm^2) in any 100 square feet (9.3 m^2) of ceiling area in assemblies tested without penetrations.
2. Ceiling *membrane penetrations* of maximum 2-hour *horizontal assemblies* by steel electrical boxes that do not exceed 16 square inches (10 323 mm^2) in area, provided that the aggregate area of such penetrations does not exceed 100 square inches (44 500 mm^2) in any 100 square feet (9.29 m^2) of ceiling area, and the *annular space* between the ceiling membrane and the box does not exceed $^1/_8$ inch (3.2 mm).
3. *Membrane penetrations* by electrical boxes of any size or type, that have been *listed* as part of an opening protective material system for use in *horizontal assemblies* and are installed in accordance with the instructions included in the listing.
4. *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 ceiling membrane and the box shall not exceed $^1/_8$ inch (3.2 mm) unless *listed* otherwise.
5. The *annular space* created by the penetration of a fire sprinkler, provided that it is covered by a metal escutcheon plate.
6. Noncombustible items that are cast into concrete building elements and that do not penetrate both top and bottom surfaces of the element.
7. The ceiling membrane of ~~1- and~~ a maximum 2-hour fire-resistance-rated *horizontal assemblies* is permitted to be interrupted with the double wood top plate of a wall assembly that is sheathed with Type X gypsum wallboard, provided that all penetrating items through the double top plates are protected in accordance with Section 714.5.1.1 or 714.5.1.2 and the ceiling membrane is tight to the top plates.
8. Ceiling membrane penetrations by listed luminaires (light fixtures) or by luminaires protected with listed materials, which have been tested for use in fire-resistance-rated assemblies and are installed in accordance with the instructions included in the listing.

Reason:

Section 714.5.2, Exception 7, relates to the double wood top plate exception, and the language currently applies only to 1- and 2- hour fire-resistance-rated horizontal assemblies. However, there are cases where the fire-resistance rating of the horizontal assembly may be 90 minutes, 45 minutes or 30 minutes.

This proposal clarifies the exception, but does not change the intent of the original IBC requirement.

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 clarifies the original intent of the exception. It does not add new construction requirements.

Internal ID: 319

FS51-18

IBC: 712.1.5.2, 715.1 (New), 715.3, , 715.3.1, 715.5, 715.6, 715.7, 715.8

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

2018 International Building Code

Revise as follows:

712.1.5.2 Joints in or between nonfire-resistance-rated floor assemblies. Joints in or between floor assemblies without a required *fire-resistance rating* shall be permitted where they comply with one of the following:

1. The joint shall be concealed within the cavity of a wall.
2. The joint shall be located above a ceiling.
3. The joint shall be sealed, treated or covered with an *approved* material or system to resist the free passage of flame and the products of combustion.

Exception: Joints meeting one of the exceptions listed in Section ~~715.1.~~715.3.

Add new text as follows:

715.1 General. The provision of this section shall govern the materials and methods of construction used to protect joints and voids in or between horizontal and vertical assemblies.

Revise as follows:

~~**715.1**~~ **715.3** ~~**General.**~~ **Fire-resistance-rated assembly intersections.**. Joints installed in or between fire-resistance-rated walls, floor or floor/ceiling assemblies and roofs or roof/ceiling assemblies shall be protected by an approved *fire-resistant joint* system designed to resist the passage of fire for a time period not less than the required *fire-resistance rating* of the wall, floor or roof in or between which the system is installed.~~Fire-resistant joint systems shall be tested in accordance with Section 715.3.~~

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

1. Floors within a single *dwelling unit*.
2. Floors where the joint is protected by a shaft enclosure in accordance with Section 713.
3. Floors within atriums where the space adjacent to the atrium is included in the volume of the atrium for smoke control purposes.
4. Floors within malls.
5. Floors and ramps within parking garages or structures constructed in accordance with Sections 406.5 and 406.6.
6. Mezzanine floors.
7. Walls that are permitted to have unprotected openings.
8. Roofs where openings are permitted.
9. Control joints not exceeding a maximum width of 0.625 inch (15.9 mm) and tested in accordance with ASTM E119 or UL 263.
10. The intersection of exterior curtain wall assemblies and the roof slab or roof deck.

Delete without substitution:

~~**715.1.1 Curtain wall assembly.** 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.~~

Revise as follows:

~~**715.3**~~ **715.3.1 Fire test criteria.** *Fire-resistant joint systems* shall be tested in accordance with the requirements of either ASTM E1966 or UL 2079. Nonsymmetrical wall joint systems shall be tested with both faces exposed to the furnace, and the assigned *fire-resistance rating* shall be the shortest duration obtained from the two tests. Where

evidence is furnished to show that the wall was tested with the least fire-resistant side exposed to the furnace, subject to acceptance of the *building official*, the wall need not be subjected to tests from the opposite side.

Exception: For *exterior walls* with a horizontal *fire separation distance* greater than 10 feet (3048 mm), the joint system shall be required to be tested for interior fire exposure only.

~~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 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 *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 in smoke barriers. *Fire-resistant joint systems* in *smoke barriers*, and joints at the intersection of a horizontal *smoke barrier* and an exterior curtain wall, shall be tested in accordance with the requirements of UL 2079 for air leakage. The 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 Pa) of water for both the ambient temperature and elevated temperature tests.

Reason:

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/Section 715 is not organized in the best fashion, which has created problems in properly applying its requirements.

This proposal, developed by the FCAC Chapter 7 work group, clarifies the requirements without making any substantive changes. Clarification was provided primarily by rearranging requirements in a more logical order, revising titles of sections so they are more descriptive of the subject matter, and correcting cross references to the new section numbers. Additional revisions include:

- A new Section 715.1 was added with charging language similar to Section 714.1.
- The cross reference in new 715.3 was removed since the referenced section immediately follows at 715.3.1.
- The cross reference in former 715.1.1 was not needed and has been deleted.

This proposal will be accompanied by a series of technical proposals. The technical proposals will introduce new and revised terminology, new and revised definitions, and new and revised requirements which complement the new organization proposed here. Assuming this proposal and the series of technical proposals are all Approved as Submitted, the updated language would appear as follows in the 2021 IBC:

SECTION 202

DEFINITIONS

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 and floors for a prescribed period of time.

F RATING. The time period that the through-penetration firestop system, perimeter fire barrier or continuity head-of-wall joint system limits the spread of fire through the penetration or void.

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 (180°C) above its initial temperature through the penetration or void on the nonfire side.

PERIMETER FIRE 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.

SECTION 707

FIRE BARRIERS

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 floor 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 current Section 707.9.

SECTION 712

VERTICAL OPENINGS

712.1.5.2 Joints in or between nonfire-resistance-rated floor assemblies. Joints in or between floor assemblies without a required fire-resistance rating shall be permitted where they comply with one of the following:

1. The joint shall be concealed within the cavity of a wall.
2. The joint shall be located above a ceiling.
3. The joint shall be sealed, treated or covered with an approved material or system to resists the free passage of flame and the products of combustion.

Exception: Joints meeting one of the exceptions listed in Section 715.3.

SECTION 715

JOINTS AND VOIDS

715.1 General. The provision of this section shall govern the materials and methods of construction used to protect joints and voids in or between horizontal and vertical assemblies.

715.2 Installation. Systems or materials protecting joints and voids shall be securely installed in accordance with the manufacturer's installation instructions in or on the joint or 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. Fire-resistant joint systems, perimeter fire barriers and continuity head-of-wall joint systems shall also be installed in accordance with the listing criteria.

715.3 Fire-resistance-rated assembly intersections. Joints installed in or between fire-resistance-rated walls, floor or floor/ceiling assemblies and roofs or roof/ceiling assemblies shall be protected by an approved fire-resistant joint system designed to resist the passage of fire for a time period not less than the required fire-resistance rating of the wall, floor or roof in or between which the system is installed.

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

1. Floors within a single dwelling unit.
2. Floors where the joint is protected by a shaft enclosure in accordance with Section 713.
3. Floors within atriums where the space adjacent to the atrium is included in the volume of the atrium for smoke control purposes.
4. Floors within malls.
5. Floors and ramps within parking garages or structures constructed in accordance with Sections 406.5 and 406.6.
6. Mezzanine floors.
7. Walls that are permitted to have unprotected openings.

8. Roofs where openings are permitted.

9. Control joints not exceeding a maximum width of 0.625 inch (15.9 mm) and tested in accordance with ASTM E 119 or UL 263.

10. The intersection of exterior curtain wall assemblies and the roof slab or roof deck.

715.3.1 Fire test criteria. Fire-resistant joint systems shall be tested in accordance with the requirements of either ASTM E1966 or UL 2079. Nonsymmetrical wall joint systems shall be tested with both faces exposed to the furnace, and the assigned fire-resistance rating shall be the shortest duration obtained from the two tests. Where evidence is furnished to show that the wall was tested with the least fire-resistant side exposed to the furnace, subject to acceptance of the building official, the wall need not be subjected to tests from the opposite side.

Exception: For exterior walls with a horizontal fire separation distance greater than 10 feet (3048 mm), the joint system shall be required to be tested for interior fire exposure only.

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 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.

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 such 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.

715.5 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 filled with an approved material or system to retard the interior spread of fire and hot gases between stories.

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 with an approved material or system to retard the interior spread of fire and hot gases.

715.7 Voids at intersections of fire barriers and underside of nonfire-resistance-rated roofs and floors. The voids created at the intersection of a fire barrier and the underside of a nonfire-resistance-rated roof or floor sheathing, slab or deck above shall be protected 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.

715.8 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 Sections 715.4 and 715.5 shall still apply to the intersection between the spandrel wall and the floor.

715.9 Joints and voids in smoke barriers. Fire-resistant joint systems protecting joints in smoke barriers, and perimeter fire 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 m3/s m) of joint at 0.30 inch (74.7 Pa) of water for both the ambient temperature and elevated temperature tests.

CHAPTER 35

REFERENCED STANDARDS

ASTM 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

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

This proposal simply reorganizes the current requirements for protecting joints and voids.

Internal ID: 332

FS52-18

IBC: 715.2, 715.4.2

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

2018 International Building Code

Revise as follows:

715.2 Installation. ~~*A fire-resistant joint system*~~Systems or materials protecting joints and voids shall be securely installed in accordance with the manufacturer's installation instructions ~~and the listing criteria~~ in or on the joint or 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. Fire-resistant joint systems or systems used to protect voids at exterior curtain walls and fire-resistance-rated floor intersections shall also be installed in accordance with the listing criteria.

715.4.2 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~~ filled with 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~~ interior spread of fire and hot gases.

Reason:

Section 715.2 of the 2018 IBC covering installation is incomplete as written. It currently covers only fire-resistant joint systems. The installation requirements relating to the protection of the other types of and voids covered in Section 715 are inconsistently covered where the protection method is described. This proposal clarifies the installation requirements for all types of protection for joints and voids. Where the protection method is required to be tested to a specific test standard, the language proposed follows what is currently specified in the 2018 IBC for this situation. Where the code only requires the void to be filled, there are no listing requirements to describe the installation of a material or system.

The revisions to Section 715.4.2 serve three purposes as follows:

- Remove the installation details which are now contained in the revised Section 715.2.
- Add the word vertical in the body to be consistent with the title.
- Add the path of fire propagation covered by this provision in a similar manner to the way the path is described for the other types of voids.

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.

Internal ID: 327

FS53-18

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

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.

Internal ID: 325

FS54-18

IBC: 715.4, 715.5

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.

Internal ID: 329

FS55-18

IBC: 715.6

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

2018 International Building Code

Revise as follows:

715.6 ~~Fire-resistant joint systems~~ Joints and voids in smoke barriers. *Fire-resistant joint systems protecting joints* in *smoke barriers*, and ~~joints~~ 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.

Reason:

The title of Section 715.6 as currently written only references the protection of one of the two types of joints and voids covered in the text of the Section. As such, this proposal expands on the title of the section to incorporate both types of joints and voids covered by the Section. In addition, the proposal 1) clarifies that it is the system protecting the joints and voids, not the joint or void itself which is being tested for an L rating, and 2) corrects the conversion from inches of water to Pa.

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.

Internal ID: 328

FS56-18

IBC: TABLE 716.1(2)

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[e]	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. .

Internal ID: 313

FS57-18

IBC: TABLE 716.1(2), 716.2.5.1.2.2

Proponent: Tom Zaremba, Roetzel & Andress, representing Glazing Industry Code Committee and Alliance of Fire Rated Glazing Manufacturers (tzaremba@ralaw.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~~ 100 sq. in.	D-H-W-240	Not Permitted	4	Not Permitted	W-240
	3	3a	~~See Note b~~ 100 sq. in.	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-resistance rating of 1 hour: Enclosures for shafts, 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	1 0.5	$^3/_4$ $^1/_3$	Maximum size tested Maximum size tested	D-H-45 D-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.

716.2.5.1.2.2 Fire walls and fire barriers. Fire-protection-rated glazing shall be permitted in *fire doors* in fire walls and fire barriers having a ~~$1\,^1/_2$ hour~~ required *fire* ~~*protection*~~ *resistance rating* ~~intended for installation in *fire barriers*~~greater than 1 hour, where limited to 100 square inches (0.065 m^2).

Reason:

Currently, the code's treatment of 100 sq. in. view panels in fire doors is inconsistent. In that regard, the code generally prohibits 100 sq. in. view panels in fire doors that are used in 3- and 4-hour fire walls or fire barriers while it specifically permits their use in fire doors in 3- and 4-hour horizontal exits in fire walls. (See, Table 716.1(2) footnote. d.) This proposal would provide for the consistent treatment of 100 sq. in. view panels in fire doors used in all 3- and 4-hour fire walls and fire barriers.

View panels in fire doors are an important feature of safely moving the general public out of a burning building. While first responders are trained in how to determine whether there is a fire on the other side of a door that you can't see through, the general public does not have that training. Unwittingly opening a door with a fire burning on the other side could seriously compromise the safety of all those attempting to exit the building.

Approving this proposal will improve the safety of exits and make the treatment of view panels in fire doors consistent throughout the code. Additionally, it will make the code consistent with NFPA 80 which permits 100 sq. in. view panels in 3-hour fire doors. (See, NFPA 80-2016, Sections 4.4.4, 4.4.5 and Table 4.4.5).

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

This proposal does not mandate any change in fire doors. Rather, it would, simply, make the treatment of view panels in fire doors consistent throughout the code and with NFPA 80. Since they are already permitted by NFPA 80 and the code already permits them in horizonal exits in fire walls, 3-hour fire doors with view panels are readily available throughout the marketplace.

Internal ID: 400

FS58-18

IBC: 716.2.2.3.1, TABLE 716.1(2)

Proponent: Tom Zaremba, Roetzel & Andress, representing Glazing Industry Code Committee and Alliance of Primary Fire Rated Glazing Manufacturers (tzaremba@ralaw.com)

2018 International Building Code

Revise as follows:

716.2.2.3.1 Glazing in doors. Fire-protection-rated glazing ~~in excess of~~ less than or equal to 100 square inches (0.065 m^2) ~~is not permitted. Fire-resistance-rated glazing~~ shall be permitted in fire doors. Any fire-rated glazing shall be permitted in excess of 100 square inches (0.065 m^2) ~~shall be permitted in *fire doors*. Listed fire-resistance-rated glazing in a *fire door* shall have~~ if it is listed and labeled as having a maximum transmitted temperature rise in accordance with Section 716.2.2.3 when the *fire door* is tested in accordance with NFPA 252, UL 10B or UL 10C.

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-90 or 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-60 or 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	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.

Reason:

Section 716.2.2.3 of the IBC mandates that certain fire doors limit the temperature rise on their non-fire exposed side during the first 30-minutes of the fire test ("Temperature Rise Doors"). In Section 716.2.2.3.1, the use of fire-protection rated glazing in such Temperature Rise Doors is limited to 100 sq. in. Fire-resistance rated glazing is permitted in sizes larger than 100 sq. in. if it is listed and labeled as meeting the maximum transmitted temperature rise permitted by Section 716.2.2.3.

Since the adoption of Section 716.2.2.3, a new class of fire-protection rated glazing was developed and is now available in the marketplace. This new type of fire-protection rated glass is specifically designed to limit temperature rise across its surface. Temperature Rise Doors tested using this new class of fire-protection rated glass in sizes greater than 100 sq. in. are now being listed by UL as fully compliant with the temperature rise limitations of Section 716.2.2.3.

The changes to Section 716.2.2.3.1 and Table 716.1(2) proposed here are intended to permit the use of this new class of fire-protection rated glass in Temperature Rise Doors in sizes larger than 100 sq. in. if, and only if, they are listed and labeled as having a maximum transmitted temperature rise in accordance with Section 716.2.2.3.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

Approving this code change proposal will not increase of decrease the cost of construction since it does not mandate the use of any product. Instead, it will, simply, increase the number of products that specifiers will have to chose from when Temperature Rise Doors are required.

Internal ID: 402

FS59-18

IBC: TABLE 716.1(2)

Proponent: Amber Armstrong, City of Norman (Oklahoma), representing self (amber.armstrong@normanok.gov)

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
	Single wall assembly rating (hours)	Each wall of the double wall assembly (hours)							
Double fire walls constructed in accordance with NFPA 221	4	3	3	See Note b	D-H-W-180	Not Permitted	3	Not Permitted	W-180
	3	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
	2	1	1	100 sq. in.	≤100 sq. in. = D-H-60 >100 sq. in. = D-H-W-60	Not Permitted	1	Not Permitted	W-60
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[e]	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-resistance rating of 1 hour: Enclosures for shafts, 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 tested Maximum size tested	D-20 D-20	$^3/_4$b $^1/_3$		D-H-OH-45 D-H-OH-20	
Other fire partitions	1 0.5		$^3/_4$ $^1/_3$	Maximum size tested Maximum size tested	D-H-45 D-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.

Reason:
This code change is intended to provide requirements for opening protection in individual walls which are part of a double fire wall constructed in accordance with NFPA 221.

According to IBC Section 706.2, "fire walls designed and constructed in accordance with NFPA 221 shall be deemed to comply with this section." In NFPA 221, 2018 edition, requirements for a specific type of fire wall called a Double Fire Wall are detailed. A Double Fire Wall consists of two walls, parallel to each other which have no connections between them and are independently supported by structural elements on either side. According to NFPA 221 Section 4.6 and Table 4.6, when each wall of a double fire wall assembly is supported by structural elements which have a fire-resistance rating less than that required for the single wall, the fire-resistance rating of each wall may be reduced by one hour. Whether a single wall or a double wall assembly, the walls are still fire walls.

In NFPA 221 Table 4.6, a 4-hour fire wall is allowed to be constructed of two 3-hour fire walls, a 3-hour fire wall is allowed to be constructed of two 2-hour fire walls, and a 2-hour fire wall is allowed to be constructed of two 1-hour walls. In NFPA 221 Table 4.9.2 and IBC Table 716.6(2) one can find requirements for opening protection assemblies for 3-hour fire walls, and 2-hour fire walls, however, there are no requirements for 1-hour walls.

During the 2015-2017 code development cycle, FS 84-15 attempted to provide requirements by creating a single line addition to the table for "Fire walls having a required fire-resistance rating of 1 hour". The committee liked the idea, however, they did not like reference to a 1-hour fire wall. During the Public Comment Hearings, a public comment was submitted which added a foot note that made reference to individual walls as part of a double fire wall assembly. The public comment was not heard because there was still confusion over the concept of a 1-hour fire wall and attempts to overturn the committee decision were unsuccessful.

There are many conditions when construction of two independent walls is a more desirable option than a single fire wall. Openings between the "separate" buildings are common. In NFPA 221, openings in each wall of the double fire wall shall be protected, however there is no direction for fire-resistance ratings for the individual walls. The designer can easily find requirements for the 3-hour and 2-hour fire walls, however, there is no direction for the 1-hour wall. The code official must determine the appropriate rating and their decision is subjective. It is possible that code officials from different jurisdictions will not be consistent.

This code change is more inclusive and clarifies opening protection assemblies for the individual walls which make up the double fire wall. Also, for the 1-hour, individual wall, it is clear that this only exists as a part of a fire wall with a 2-hour fire-resistance rating.

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

The change will not increase the cost of construction because this change clarifies opening protection assemblies in the individual walls are based on the fire-resistance rating of the individual walls which is less than that which would be required for the single wall.

Analysis: The referenced standard,NFPA 221, is currently referenced in other 2018 I-codes.

Internal ID: 2269

FS60-18

IBC: SECTION 202, 202 (New), 716.2.2.1.1

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".

Internal ID: 2329

FS61-18

IBC: 716.2.2.3.1, TABLE 716.1(2)

Proponent: Kurt Roeper, ASSA ABLOY, representing ASSA ABLOY (kurt.roeper@assaabloy.com)

2018 International Building Code

Revise as follows:

716.2.2.3.1 Glazing in doors. ~~Fire protection rated glazing in excess of 100 square inches (0.065 m^2) is not permitted.~~ Fire protection rated glazing in excess of 100 square inches (0.065 m^2) shall be permitted in fire doors where buildings are equipped with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2. Where buildings are not equipped with an automatic sprinkler system and the area of glazing in a fire door is greater than 100 square inches (0.65 m^2), fire-resistance-rated glazing is required. ~~*fire doors*. Listed fire-resistance-rated glazing in a *fire door* shall have a maximum transmitted temperature rise in accordance with Section 716.2.2.3 when the *fire door* is tested in accordance with NFPA 252, UL 10B or UL 10C.~~

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, f]	≤100 sq. in. = D-H-90 > 100 sq. in.= D-H-T-W-90 or D-H-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-resistance rating of 1 hour: Enclosures for shafts, 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 or D-H-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	1 0.5	$^3/_4$$^1/_3$	Maximum size tested Maximum size tested	D-H-45 D-H-20	$^3/_4$$^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. Except where the building is equipped throughout with an automatic sprinkler system and the fire-rated glazing is in accordance with Section 716.2.2.3.1.

Reason:

Per the exception in 716.2.2.3, the maximum transmitted temperature rise is not required in buildings equipped throughout with an automatic sprinkler system. As written, section 716.2.2.3.1 does not provide the same exception for glazing in excess of 100 square inches in a door. This proposed change provides consistency of the performance requirements between the door and glazing when the exception is exercised.

Cost Impact

The code change proposal will decrease the cost of construction .

The proposal will decrease the cost of construction in cases where the exception of 716.2.2.3 has been exercised

Internal ID: 2293

FS62-18

IBC: 202, 717.2, 717.2.3 (New), 717.3.1; IMC 202, 607.2, 607.3.1

Proponent: Jonathan Roberts, UL LLC, representing UL LLC (jonathan.roberts@ul.com)

2018 International Building Code

SECTION 202 DEFINITIONS

Revise as follows:

[BF] CEILING RADIATION DAMPER. A listed device installed in a ceiling membrane of a fire-resistance-rated floor/ceiling or roof/ceiling assembly to limit automatically the radiative heat transfer through an air inlet/outlet opening. Ceiling radiation dampers include air terminal units, ceiling dampers and ceiling air diffusers. Ceiling radiation dampers are classified for use in either static systems that will automatically shut down in the event of a fire, or in dynamic systems that continue to operate during a fire. A dynamic ceiling radiation damper is tested and rated for closure under elevated temperature airflow.

717.2 Installation. Fire dampers, smoke dampers, combination fire/smoke dampers and ceiling radiation dampers located within air distribution and smoke control systems shall be installed in accordance with the ~~requirements of this section, the~~ manufacturer's instructions ~~and~~ , the dampers~~' listing.~~' listing and Sections 717.2.1 through 717.2.3.

Add new text as follows:

717.2.3 Static dampers. Fire dampers and ceiling radiation dampers that are listed for use in static systems shall only be installed in heating, ventilation and air-conditioning systems that are automatically shut down in the event of a fire.

Revise as follows:

717.3.1 Damper testing. *Dampers* shall be listed and labeled in accordance with the standards in this section.

1. *Fire dampers* shall comply with the requirements of UL 555~~. Only fire *dampers* labeled for use in dynamic systems shall be installed in heating, ventilation and air-conditioning systems designed to operate with fans on during a fire.~~
2. *Smoke dampers* shall comply with the requirements of UL 555S.
3. *Combination fire/smoke dampers* shall comply with the requirements of both UL 555 and UL 555S.
4. *Ceiling radiation dampers* shall comply with the requirements of UL 555C or shall be tested as part of a fire-resistance-rated floor/ceiling or roof/ceiling assembly in accordance with ASTM E119 or UL 263. Only *ceiling radiation dampers* labeled for use in dynamic systems shall be installed in heating, ventilation and air-conditioning systems designed to operate with fans on during a fire.
5. *Corridor dampers* shall comply with requirements of both UL 555 and UL 555S. *Corridor dampers* shall demonstrate acceptable closure performance when subjected to 150 feet per minute (0.76 mps) velocity across the face of the *damper* during the UL 555 fire exposure test.

Reason:

The reason for the definition change is that UL 555C now has requirements to test ceiling radiation dampers for either closure under dynamic or static conditions. This information is also included in the definition of “fire damper”

The last sentence in Items 1 and 4 regarding dynamic-type fire dampers and ceiling radiation dampers are installation requirements, not testing requirements. These requirements should be in Section 717.2. Static-type fire dampers and ceiling radiation dampers have been evaluated only for use where the air movement is effectively stopped at the start of a fire. Dynamic-type fire dampers and ceiling radiation dampers, as well as smoke dampers, combination fire/smoke dampers, and corridor dampers, have been evaluated been evaluated for use in HVAC systems where the airflow is operational at the time of a fire, such as in a smoke-control system, or from other situations in which the fan system is operational at the time of a fire. Also, Section 717.2, and the subsections, apply to the installation of dampers.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

This proposal relocates the existing installation requirements for ceiling radiation dampers to the appropriate code section.

FS63-18

IBC 717.3.1 (IMC 607.3.1)

Proponent: Guy McMann, representing Colorado Association of Plumbing and Mechanical Officials (CAPMO) (gmcmann@jeffco.us)

2018 International Building Code

Revise as follows:

717.3.1 Damper testing. *Dampers* shall be listed and labeled in accordance with the standards in this section.

1. *Fire dampers* shall comply with the requirements of UL 555. Only fire *dampers* labeled for use in dynamic systems shall be installed in heating, ventilation and air-conditioning systems designed to operate with fans on during a fire.
2. *Smoke dampers* shall comply with the requirements of UL 555S.
3. *Combination fire/smoke dampers* shall comply with the requirements of both UL 555 and UL 555S.
4. *Ceiling radiation dampers* shall comply with the requirements of UL 555C or shall be tested as part of a fire-resistance-rated floor/ceiling or roof/ceiling assembly in accordance with ASTM E119 or UL 263. Only *ceiling radiation dampers* labeled for use in dynamic systems shall be installed in heating, ventilation and air-conditioning systems designed to operate with fans on during a fire.

   Exception: Ceiling radiation dampers shall not be required to be dynamic rated in dwelling unit HVAC systems where the air handler is shut off upon detection of smoke by the smoke alarms installed in the dwelling unit.

5. *Corridor dampers* shall comply with requirements of both UL 555 and UL 555S. *Corridor dampers* shall demonstrate acceptable closure performance when subjected to 150 feet per minute (0.76 mps) velocity across the face of the *damper* during the UL 555 fire exposure test.

Reason:
At this point in time there are no manufacturers of ceiling radiation dampers (crd's) rated for use in dynamic systems. The code is calling for a requirement that is not available but these fire dampers are being installed in every R-2 being built today with little repercussions. The code says these dampers aren't permitted but gives no guidance as to what to do about it. Non-dynamic rated crd's will continue to be installed in dynamic systems regardless because there are no other options. R-2's will continue to be built. This proposal provides a solution to the dilemma and provides a safe alternative to the problem by tying the smoke detectors to the air handlers there by stopping the airflow which will permit the damper to release the way it was designed to do. The manufacturers have no plans to test their products as there is little motivation to do so .

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

This proposal in editorial in nature

Internal ID: 143

FS64-18

IBC: 717.3.1 (IMC 607.3.1), 717.6.2.1.1 (New), 717.6.2.1.2 (New);

Proponent: Eirene Knott, representing Metropolitan Kansas City Chapter of the ICC (Eirene.Knott@brrarch.com)

2018 International Building Code

Revise as follows:

717.3.1 Damper testing. *Dampers* shall be listed and labeled in accordance with the standards in this section.

1. *Fire dampers* shall comply with the requirements of UL 555. Only fire *dampers* labeled for use in dynamic systems shall be installed in heating, ventilation and air-conditioning systems designed to operate with fans on during a fire.
2. *Smoke dampers* shall comply with the requirements of UL 555S.
3. *Combination fire/smoke dampers* shall comply with the requirements of both UL 555 and UL 555S.
4. *Ceiling radiation dampers* shall comply with the requirements of UL 555C or shall be tested as part of a fire-resistance-rated floor/ceiling or roof/ceiling assembly in accordance with ASTM E119 or UL 263. ~~Only *ceiling radiation dampers* labeled for use in dynamic systems shall be installed in heating, ventilation and air-conditioning systems designed to operate with fans on during a fire.~~
5. *Corridor dampers* shall comply with requirements of both UL 555 and UL 555S. *Corridor dampers* shall demonstrate acceptable closure performance when subjected to 150 feet per minute (0.76 mps) velocity across the face of the *damper* during the UL 555 fire exposure test.

Add new text as follows:

717.6.2.1.1 Dynamic systems. Only ceiling radiation dampers labeled for use in dynamic systems shall be installed in heating, ventilation and air-conditioning systems designed to operate with fans on during a fire.

717.6.2.1.2 Static systems. Static dampers shall be provided with systems which are not designed to operate during a fire.

Exceptions:

1. Where a static ceiling radiation damper is installed at the opening of a duct, a smoke detector shall be installed inside the duct or outside the duct with sampling tubes protruding into the duct. The detector or tubes within the duct shall be within 5 feet (1524 mm) of the damper. Air outlets and inlets shall not be located between the detector or tubes and the damper. The detector shall be listed for the air velocity, temperature and humidity anticipated at the point where it is installed. Other than in mechanical smoke control systems, dampers shall be closed upon fan shutdown where local smoke detectors require a minium velocity to operate.
2. Where a static ceiling radiation damper is installed in a ceiling, the damper shall be permitted to be controlled by a smoke detection system installed within the same room as the ceiling radiation damper.
3. Where a static ceiling radiation damper is installed in an area served by the duct in which the damper will be located, the ceiling radiation damper shall be permitted to be controlled by the smoke detection system.
4. Where a ceiling radiation damper is installed within a room and an occupant sensor is provided within the room served by the damper, a static damper shall be permitted.

Reason:

The purpose behind this code change is to provide some direction on the use of dynamic versus static ceiling radiation dampers (CRD's). As of the writing of this proposed code change, there are no UL listed CRD's that are dynamic; I have confirmed this with UL.

Under the 2018 IBC/IMC, if a CRD is required in a floor/ceiling assembly, the only choice is to utilize a static damper since no dynamic dampers are available. Under a static system, there can be no air movement within the duct once the system is shut down. So, unless a system is designed to shut down with activation of a smoke detector or other detection device, a static damper cannot be used unless the entire system is designed to shut down upon activation of an initiation device. Exhaust systems and 100 percent outside air systems fall into the definition of static systems as

they do not shut down at the activation of an initiation device. As a result, these systems would then be required to provide dynamic dampers. Since CRD's do not exist in the dynamic form, there is no clear direction within the code as to how a static system could be designed to utilize static CRD's.This provides limitations to the designer on how to design an exhaust or outside air system within floor/ceiling or roof/ceiling assemblies.

If we use an R-1 occupancy as an example, some hotel brands utilize interstitial space within the floor/ceiling assembly to convey toilet room exhaust. Because there is no clear direction in the IBC or the IMC some hotel brands are providing a sensor of some sort on each exhaust fan serving the toilet room within each sleeping unit because the CRD is being required to stop the flow of air. One option that is being utilized to overcome this missing direction is to provide an occupant sensor within the toilet room that controls the activation of the exhaust fan. If the toilet room is vacant, the exhaust fan is not running and therefore the system is static. I believe this proposed code change would achieve the protection that is expected by the IBC/IMC as well as providing options for the design professional to have choices in their system layout/function.

Cost Impact

The code change proposal will increase the cost of construction .

While I cannot confirm the exact cost impact that this code change would provide, by giving the designer some options for using static dampers, this should potentially decrease the cost of construction.

Internal ID: 302

FS65-18

IBC: 717.3.3.1

Proponent: William Koffel, representing Air Movement and Control Association (wkoffel@koffel.com)

2018 International Building Code

Revise as follows:

717.3.3.1 Fire damper ~~actuation device.~~actuation. ~~The *fire damper* actuation device~~ Primary heat responsive devices used to actuate fire dampers shall meet one of the following requirements:

1. The operating temperature shall be approximately 50°F (10°C) above the normal temperature within the duct system, but not less than 160°F (71°C).
2. The operating temperature shall be not more than 350°F (177°C) where located in a smoke control system complying with Section 909.

Reason:
"Primary heat responsive device" is the terminology used in UL 555 and as such, should be the phrase used in the IBC. The change in the title is consistent with the title used for smoke damper actuation.

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

The proposal will have no impact on the cost of construction. It is simply a change in terminology to be consistent with the UL test standard.

Internal ID: 1549

FS66-18

IBC: 717.4, 717.4.1 (New), 717.4.1.1 (New), 717.4.1.2 (New), 717.4.2 (New), 717.4.3 (New)

Proponent: William Koffel, representing Air Movement and Control Association (wkoffel@koffel.com)

2018 International Building Code

Revise as follows:

717.4 Access ~~and~~ identification and periodic inspection and testing. Access, identification and periodic inspection and testing of fire and smoke dampers shall comply with Sections 717.4.1 through 717.4.3.

Add new text as follows:

717.4.1 Access. Fire and smoke dampers shall be provided with an approved means of access that is large enough to permit inspection and maintenance of the damper and its operating parts.

717.4.1.1 Access openings. The access shall not affect the integrity of fire-resistance-rated assemblies. The access openings shall not reduce the fire-resistance rating of the assembly. Access doors in ducts shall be tight fitting and suitable for the required duct construction.

717.4.1.2 Restricted access . Where space constraints or physical barriers restrict access to a damper for periodic inspection and testing, the damper shall be a single- or multi-blade type damper and shall comply with the remote inspection requirements of NFPA 80 or NFPA 105

717.4.2 Identification. Access points shall be permanently identified on the exterior by a label having letters not less than 1/2 inch (12.7 mm) in height reading: FIRE/SMOKE DAMPER, SMOKE DAMPER or FIRE DAMPER.

717.4.3 Periodic inspection and testing. Periodic inspection and testing of fire dampers shall be in accordance with NFPA 80. Periodic inspection and testing of smoke dampers shall be in accordance with NFPA 105. Periodic inspection and testing of combination fire/smoke dampers shall be in accordance with NFPA 80 and NFPA 105.

Reason:
It is understood that periodic inspection and testing is typically within the scope of the IFC. However, it is not uncommon to alert interested parties to these requirements in the IBC (for example see Chapter 9). In this instance it is important for the design professional to be aware of the inspection and testing requirements since they impact the access requirements contained in the IBC. In addition, the proposal provides design professionals with an alternative of remote testing (as permitted by NFPA 80 and NFPA 105) in situations where adequate access for inspection and testing cannot be provided.

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

The alternative for remote testing does not impact the cost of construction because it is not required. However, recognizing that remote testing is an option may actually decrease the cost of construction in instances where providing adequate access is challenging.

Analysis. The proposal takes existing Section 717.4 and breaks it into subsections. Much of the text in the subsections is existing text redistributed from 717.4. The cdpACCESS system parameters result in showing new sections as having new text even where the text is not new but is being reorganized.

Internal ID: 1551

FS67-18

IBC: 717.5.2 (IMC 607.5.2)

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

2018 International Building Code

Revise as follows:

717.5.2 Fire barriers. Ducts and air transfer openings of *fire barriers* shall be protected with *listed fire dampers* installed in accordance with their listing. Ducts and air transfer openings shall not penetrate enclosures for *interior exit stairways* and *ramps* and *exit passageways*, except as permitted by Sections 1023.5 and 1024.6, respectively.

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

1. Penetrations are tested in accordance with ASTM E119 or UL 263 as part of the fire-resistance-rated assembly.
2. Ducts are used as part of an *approved* smoke control system in accordance with Section 909 and where the use of a *fire damper* would interfere with the operation of a smoke control system.
3. Such walls are penetrated by fully ducted HVAC systems, have a required *fire-resistance rating* of 1 hour or less, are in areas of other than Group H and are in buildings equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1 or 903.3.1.2. For the purposes of this exception, a fully ducted HVAC system shall be a duct system for conveying supply, return or exhaust air as part of the structure's HVAC system. Such a duct system shall be constructed of sheet steel not less than No. 26 gage thickness and shall be continuous from the air-handling appliance or equipment to the air outlet and inlet terminals. Flexible air connectors shall be permitted in the following locations:
   - 3.1. Non-metal flex connections shall be permitted at the duct connection to the air handling unit or equipment located within the mechanical room in accordance with Section 603.9 of the International Mechanical Code.
   - 3.2. Non-metal flex connections shall be permitted from an overhead metal duct to a ceiling diffuser within the same room in accordance with Section 603.6.2 of the International Mechanical Code.

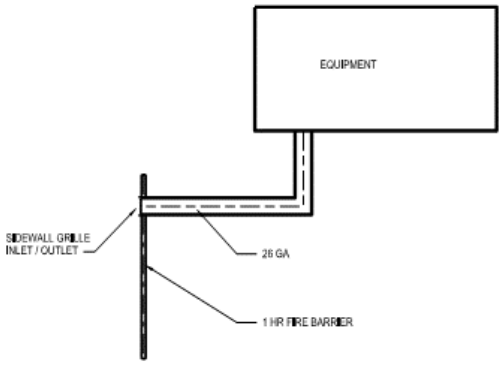
Reason:

The intention of this code change is to more accurately reflect typical installations found in most buildings, As currently written, the code implies that any flex duct (or equipment flexible connections) negates the use of the exception for fire dampers in 1 hour walls in fully ducted, fully sprinklered buildings.

The code permits the omission of the fire damper for a metal duct system that terminates either at a wall (such as a sidewall grille) or continues on to a duct opening past the fire barrier and has openings in the duct ("continuous from the air-handling appliance or equipment to the air outlet and inlet terminals"). This section does not prohibit openings to be on both sides of the duct as long as the openings are in metal duct. However, as currently written, if flex duct is used to connect a metal duct to a ceiling diffuser (standard practice) this triggers the requirement for a fire damper.

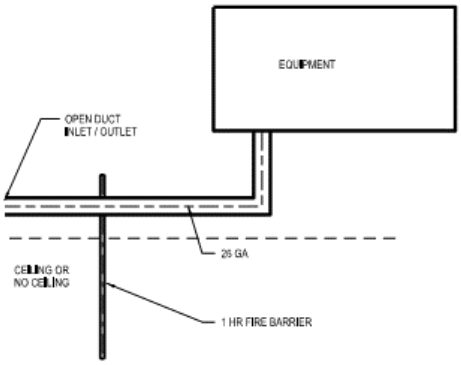
The flex connection within the concealed space does not constitute a greater hazard then other conditions that would permit the omission of the fire dampers (see attached sketches below).

FULLY SPRINKLERED BUILDING
FULLY DUCTED HVAC



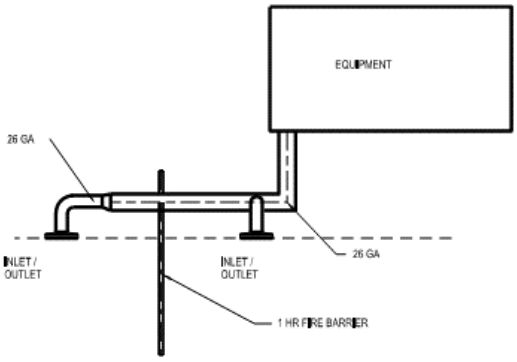
NO FIRE DAMPER REQUIRED

FULLY SPRINKLERED BUILDING
FULLY DUCTED HVAC



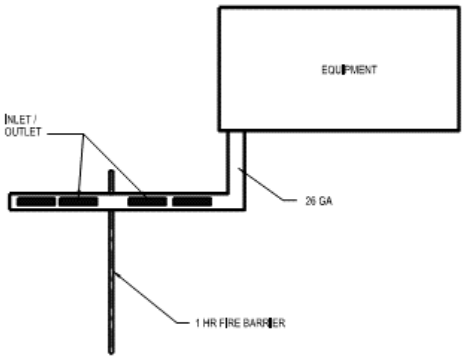
NO FIRE DAMPER REQUIRED

FULLY SPRINKLERED BUILDING
FULLY DUCTED HVAC

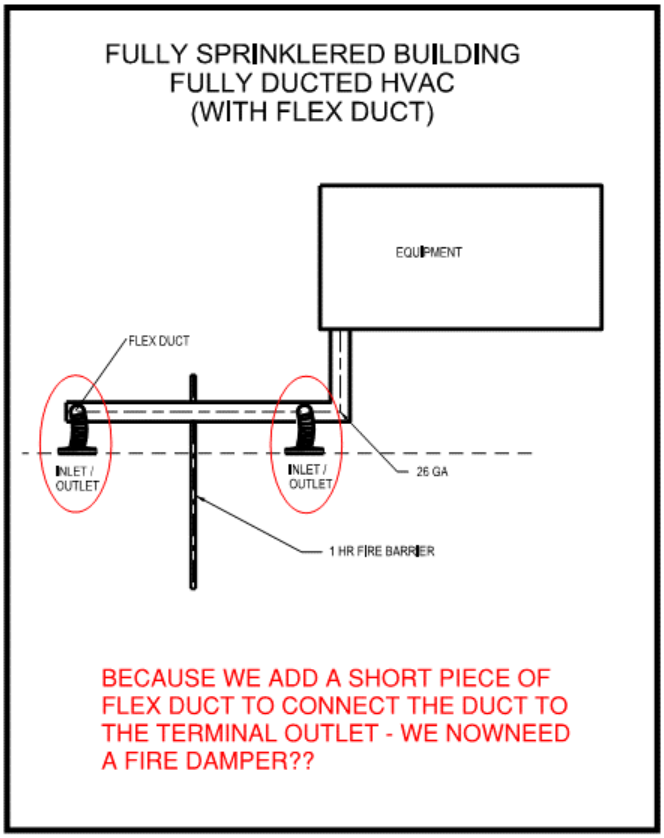


NO FIRE DAMPER REQUIRED

FULLY SPRINKLERED BUILDING
FULLY DUCTED HVAC



NO FIRE DAMPER REQUIRED



Likewise, a flex connection at the AHU within the mechanical space does not constitute a hazard that should trigger the fire damper within the system

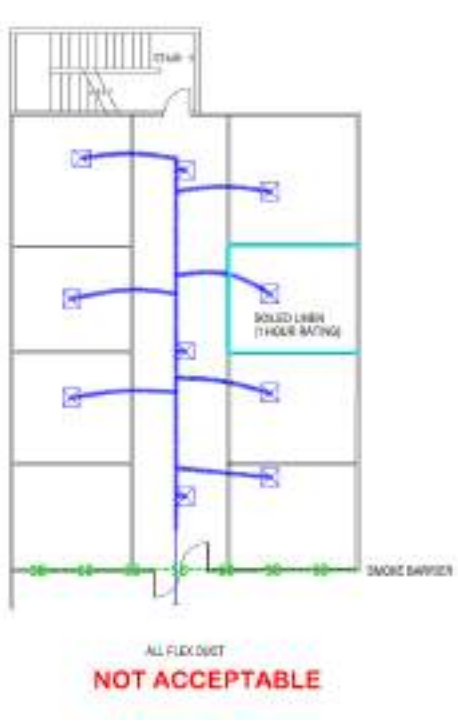
As proposed, this section will coordinate with the requirements already established in the International Mechanical Code. IMC Section 606.6.3 limits the design air temperature for flexible air connectors to 250 degrees F (121 C). Under the vast majority of conditions where flexible air connectors will be used (installed above a ceiling, light or ordinary hazard occupancy, ordinary or intermediate temperature sprinklers, quick or standard response), the sprinkler response can be demonstrated by calculation to occur before the ceiling jet temperature from a fire reaches the limit of 606.6.3.

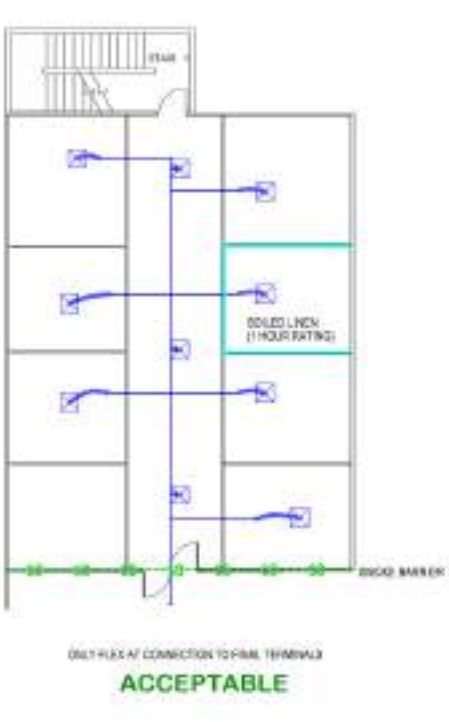
The intention is to maintain the allowance of flexible connectors at the terminal end of hard ductwork within the room of the air register. This public comment maintains the requirements of the IMC, including:

Limiting the length of the flexible connector to 14 feet actual length.

Requiring the flexible connector to be tested in accordance with UL 181.
Requiring use only at the end of hard ductwork.
Maintains the requirement for hard ductwork to pass through the barrier.
This allows constructability of a fully ducted system, and maintains the integrity of the system throughout the building.

It is not the intention of the code change to allow flexible ducts through any vertical barriers (as already prohibited by Section 717.7). The flexible ductwork is only to be allowed within a room, and above the ceiling. See the sketch below to better clarify the intention.





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 decrease the cost of construction .

This proposed code change would result in a decrease in construction cost since this will eliminate fire dampers where the building/installation complies with the requirements of the proposed exception. Where a building does not meet the requirements of the proposed exception, there would be no change in construction cost (dampers would still be required as they are now).

Internal ID: 1286

FS68-18

IBC: 717.5.2 (IMC 607.5.2)

Proponent: Mark Jelinske, representing Self (mjelinske@rmhgroup.com)

2018 International Building Code

Revise as follows:

717.5.2 Fire barriers. Ducts and air transfer openings of *fire barriers* shall be protected with *listed fire dampers* installed in accordance with their listing. Ducts and air transfer openings shall not penetrate enclosures for *interior exit stairways* and *ramps* and *exit passageways*, except as permitted by Sections 1023.5 and 1024.6, respectively.

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

1. Penetrations are tested in accordance with ASTM E119 or UL 263 as part of the fire-resistance-rated assembly.
2. Ducts are used as part of an *approved* smoke control system in accordance with Section 909 and where the use of a *fire damper* would interfere with the operation of a smoke control system.
3. ~~Such walls are penetrated by ducted HVAC systems, have a required *fire resistance rating* of 1 hour or less, are in areas of other than Group H and are in buildings equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1 or 903.3.1.2. For the purposes of this exception, a ducted HVAC system shall be a duct system for conveying supply, return or exhaust air as part of the structure's HVAC system. Such a duct system shall be constructed of sheet steel not less than No. 26 gage thickness and shall be continuous from the air-handling appliance or equipment to the air outlet and inlet terminals.~~

Reason:

There is no empirical evidence showing that the integrity of a Fire Barrier is not compromised by a ducted penetration simply because the building is protected by sprinklers.

It might be argued that since this exception can only be used in a fully sprinklered building, the challenge to the Fire Barrier is much less than the time/temperature curve of the ASTM/UL test. However, the extent and rating of Fire Barriers is already greatly reduced in a fully spriniklered building; so the counter argument is that the Fire Barriers in a fully sprinklered building are very important and constitute the "last stand" of the passive Life Safety features of a building. These should not rely on an active means of protection. The protection for no other penetration or opening is allowed to be eliminated simply due to sprinklers.

Where dampers are not desired, exception 1 already has the provision for an assembly tested in accordance with ASTM E119 or UL 263. Such an assembly has shown evidence of maintaining the integrity of fire resistive construction. This should be the standard for a "last stand" passive Life Safety feature.

Note that this proposal does not include eliminating the similar exception for Fire Dampers in Fire Partitions. Fire Partitions are already considered a lower level of protection, and therefore a lower standard for protection is appropriate.

Cost Impact

The code change proposal will increase the cost of construction .

Since an exception is being eliminated, some additional dampers will be required. But the extent of Fire Barriers in most occupancies is already reduced with sprinklers. Further, the ability to apply this exception is not that common for the remaining Fire Barriers in sprinklered buildings, since the common case of HVAC system using flexible duct, flexible equipment connections, or flexible seismic joints disqualify such systems from being considered "ducted".

Internal ID: 1113

FS69-18

IBC: 717.5.3

Proponent: Raymond Grill, Arup, representing Self (ray.grill@arup.com)

2018 International Building Code

Revise as follows:

717.5.3 Shaft enclosures. Shaft enclosures that are permitted to be penetrated by ducts and air transfer openings shall be protected with *listed* fire and *smoke dampers* installed in accordance with their listing.

Exceptions:

1. *Fire dampers* are not required at penetrations of shafts where any of the following criteria are met:
   - 1.1. Steel exhaust subducts are extended not less than 22 inches (559 mm) vertically in exhaust shafts, provided that there is a continuous airflow upward to the outside.
   - 1.2. Penetrations are tested in accordance with ASTM E119 or UL 263 as part of the fire-resistance-rated assembly.
   - 1.3. Ducts are used as part of an approved smoke control system designed and installed in accordance with Section 909 and where the *fire damper* will interfere with the operation of the smoke control system.
   - 1.4. The penetrations are in parking garage exhaust or supply shafts that are separated from other building shafts by not less than 2-hour fire-resistance-rated construction.
2. I n ~~Group B and R~~ occupancies equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1, *smoke dampers* are not required at penetrations of shafts ~~where all of the following criteria are met:~~
   - ~~2.1. Kitchen, clothes dryer, bathroom and toilet room exhaust openings are installed with steel exhaust subducts, having a minimum wall thickness of 0.0187 inch (0.4712 mm) (No. 26 gage).~~
   - ~~2.2. The subducts extend not less than 22 inches (559 mm) vertically.~~
   - ~~2.3. An exhaust fan is installed at the upper terminus of the shaft that is powered continuously in accordance with the provisions of Section 909.11, so as to maintain a continuous upward airflow to the outside.~~
3. *Fire and smoke dampers* are not required at penetration of exhaust or supply shafts in parking garages that are separated from other building shafts by not less than 2-hour fire-resistance-rated construction.
4. *Smoke dampers* are not required at penetrations of shafts where ducts are used as part of an *approved* mechanical smoke control system designed in accordance with Section 909 and where the *smoke damper* will interfere with the operation of the smoke control system.
5. *Fire dampers* and *combination fire/smoke dampers* are not required in kitchen and clothes dryer exhaust systems where *dampers* are prohibited by the International Mechanical Code.

Reason:

The requirement for smoke dampers at penetrations in shafts was first included in the IBC during the comment phase of the development of the first edition of the International Building Code. This requirement did not exist in any of the model building codes (BOCA,UBC & SBC). A requirement for smoke dampers at penetrations of shafts has never been incorporated in the NFPA system of codes. The justification for smoke dampers in the original code change is that smoke can travel through a duct to locations in a building that are remote from the fire. While this statement is correct, smoke travel through ducted ventilation shafts has not been a contributing factor to firespread or fire deaths in buildings. Smoke detectors at HVAC equipment have been required to accomplish automatic shut off of HVAC equipment to minimize the potential of smoke spread through ventilation ducts. For example, the majority of fire deaths in upper stories of the MGM Grand fire of 1980 were due to smoke spread through stair shafts and seismic joints that were not protected. Fancoil units in guestrooms drew air from the corridors which also contributed to fatalities. While the HVAC system was cited as a potential source of smokespread, smoke detectors were not present

to provide automatic shutoff of equipment (NFPA Preliminary Report of the MGM Grand HotelFire). The MGM Grand was not sprinkler protected.

There was only one fatality in an upper story of the San Juan DuPont fire in 1986 which was not readily explained. The San Juan Dupont was not sprinker protected. Smoke travel through ventilation shafts was not a contributing factor in the First Interstate fire in Los Angeles or the Meridian fire in Philadelphia. Sprinklers were not active on fire floors in either of those buildings. Even in the World Trade Center bombing of1993, 6 fatalities were attributed to the explosion, but there were no fatalities due to the effects of smoke (Isner, Michael S. and Klem, ThomasJ., "World Trade Center Explosion and Fire," National Fire Protection Association). While these fires were thoroughly investigated, and code changes promulgated to address fire safety issues, smoke dampers in duct penetrations of shafts were never adopted as changes to any of the model codes as a result of these fires.

The original code change in the IBC did not present any technical substantiation for the additional requirement for smoke dampers and there has never been an instance that I am aware of where the provision of smoke dampers in shafts would have made a difference in the fire performance of a fully sprinklered building.

This requirement has been massaged based on negotiation with manufactures and building ownership groups over the past code cycles because it has always been difficult to implement. The requirement for smoke dampers at penetrations of shafts should be removed for fully sprinklered buildings.

There have been jurisdictions (District of COlumbia and Commonwealth of Virginia) and federal agencies that have never adopted the smoke damper requirement for sprinklered buildings. There have not been any incidences reported to show a need for smoke dampers. Agencies include the General Services Administration,Department of Veteran Affairs, and Department of Defense. These agencies own and operate buildings that include all of the occupancy types addressed by the IBC. Smoke dampers are not required in shaft penetrations in their buildings.

Performance of Fully Sprinklered Buildings

It is important to note that the IBC requires sprinkler protection for most buildings of any significant size or occupant load. Therefore, the performance of sprinklered buildings is relevant. There has never been a multiple life loss fire in a fully sprinklered building of any occupancy type where the occupants have not been intimate with the fire or where an explosive or terrorist event has occurred.

Fire incidents in fully sprinklered buildings have never been identified to demonstrate the need for smoke dampers at shaft penetrations..

Maintaining Operability

Smoke dampers are operated by either a pneumatic actuator or electric motor. Smoke dampers require regular testing and maintenance to keep them operating. Even the most diligent building owners have a difficult time maintaining operability of smoke dampers.

Sustainability

There is a significant amount of resources that go into the implementation of smoke dampers at shaft penetrations. There has not been a demonstrated value to property protection or life safety in fully sprinklered buildings to justify their need.

Cost Impact

The code change proposal will decrease the cost of construction .

This code change will significantly reduce the cost of construction. A rough installed cost estimate for the smoke dampers and associated required equipment can range from $2000-$3000 per damper or even more for large dampers. This does not include the ongoing cost of testing the dampers and detectors that are required to operate the dampers. Regular testing is also required at regular frequencies. Testing costs per damper can vary depending on the number of dampers being tested and the accessibility and complexity of the system.

Internal ID: 2307

FS70-18

IBC: 717.5.3 (IMC [BF] 607.5.5) , 717.5.3.1 (New)

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

2018 International Building Code

Revise as follows:

717.5.3 Shaft enclosures. Shaft enclosures that are permitted to be penetrated by ducts and air transfer openings shall be protected with *listed* fire and *smoke dampers* installed in accordance with their listing.

Exceptions:

1. *Fire dampers* are not required at penetrations of shafts where any of the following criteria are met:
   - 1.1. Steel exhaust subducts having a wall thickness of not less than 0.0187 inch (0.4712 mm) are extended not less than 22 inches (559 mm) vertically in exhaust shafts, ~~provided that there is a continuous airflow upward to the outside.~~and an exhaust fan is installed at the upper terminus of the shaft that is powered continuously in accordance with Section 909.11, so as to maintain a continuous upward airflow to the outdoors.
   - 1.2. Penetrations are tested in accordance with ASTM E119 or UL 263 as part of the fire-resistance-rated assembly.
   - 1.3. Ducts are used as part of an approved smoke control system designed and installed in accordance with Section 909 and where the *fire damper* will interfere with the operation of the smoke control system.
   - 1.4. The penetrations are in parking garage exhaust or supply shafts that are separated from other building shafts by not less than 2-hour fire-resistance-rated construction.
2. In Group B and R occupancies equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1, *smoke dampers* are not required at penetrations of shafts where all of the following criteria are met:
   - 2.1. Kitchen, clothes dryer, bathroom and toilet room exhaust openings are installed with steel exhaust subducts, having a ~~minimum~~ wall thickness of not less than 0.0187-inch (0.4712 mm~~) (No. 26 gage~~).
   - 2.2. The subducts extend not less than 22 inches (559 mm) vertically.
   - 2.3. An exhaust fan is installed at the upper terminus of the shaft that is powered continuously in accordance with the provisions of Section 909.11, so as to maintain a continuous upward airflow to the ~~outside.~~outdoors.
3. *Smoke dampers* are not required at penetration of exhaust or supply shafts in parking garages that are separated from other building shafts by not less than 2-hour fire-resistance-rated construction.
4. *Smoke dampers* are not required at penetrations of shafts where ducts are used as part of an *approved* mechanical smoke control system designed in accordance with Section 909 and where the *smoke damper* will interfere with the operation of the smoke control system.
5. *Fire dampers* and *combination fire/smoke dampers* are not required in kitchen and clothes dryer exhaust systems where *dampers* are prohibited by the International Mechanical Code.

Add new text as follows:

717.5.3.1 Continuous upward airflow. Fire dampers and smoke dampers shall not be installed in shafts that are required to maintain a continuous upward airflow path where closure of the damper would result in the loss of the airflow.

Reason:

Exceptions 1.1 and 2 involve subducts used as a substitute for fire and smoke dampers, respectively. Subducts depend on continuous upward airflow in the shaft to function as intended. Fire dampers or smoke dampers installed in the airpath in a manner that would cutoff the upward airflow through the shaft to the exhaust fan at the top of the shaft when the damper closes would negate the effectiveness of the subducts. An example of where this situation might occur is with two offset shafts, one with an exhaust fan on one without, connected together with a horizontal duct.

Section 717.5.3 would require fire and smoke dampers where the interconnecting duct penetrates the walls of each shaft enclosure. But such use would cut off the continuous airflow through the shaft which does not contain the exhaust fan. This proposal resolves that issue by stating that fire and smoke dampers shall not be installed where such installation would result in a loss of this airflow path. From there, since the penetrations are not protected with a fire damper, Section 717.1.2 would require the penetrations to be protected with a through-penetration firestop system.

Additional changes are being proposed to create consistency between the requirements for the subducts in Exceptions 1 and 2 of Section 717.5.3.

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 .

Where ducts are used to create the continuous upwards airflow, penetrations of these ducts into and out of shaft will now be required to be protected with a through-penetration firestop system in lieu of a fire and smoke damper.

Internal ID: 301

FS71-18

IBC: 717.5.2, 717.5.4;

IMC: 607.5.2, 607.5.3

Proponent: Mark Jelinske, representing Self (mjelinske@rmhgroup.com)

2018 International Building Code

Revise as follows:

717.5.2 Fire barriers. Ducts and air transfer openings of *fire barriers* shall be protected with *listed fire dampers* installed in accordance with their listing. Ducts and air transfer openings shall not penetrate enclosures for *interior exit stairways* and *ramps* and *exit passageways*, except as permitted by Sections 1023.5 and 1024.6, respectively.

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

1. Penetrations are tested in accordance with ASTM E119 or UL 263 as part of the fire-resistance-rated assembly.
2. Ducts are used as part of an *approved* smoke control system in accordance with Section 909 and where the use of a *fire damper* would interfere with the operation of a smoke control system.
3. Such walls are penetrated by ducted HVAC systems, have a required *fire-resistance rating* of 1 hour or less, are in areas of other than Group H and are in buildings equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1 or 903.3.1.2. For the purposes of this exception, a ducted HVAC system shall be a duct system for conveying supply, return or exhaust air as part of the structure's HVAC system. Such a duct system shall be constructed of sheet steel not less than No. 26 gage thickness and shall be continuous from the air-handling appliance or equipment to the final branch connection to individual air outlet and inlet terminals. The final duct branches to the air inlets or outlets shall be accordance with Section 603 of the International Mechanical Code.

717.5.4 Fire partitions. Ducts and air transfer openings that penetrate *fire partitions* shall be protected with *listed fire dampers* installed in accordance with their listing.

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

1. Corridor walls in buildings equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1 or 903.3.1.2 and the duct is protected as a through penetration in accordance with Section 714.
2. Tenant partitions in *covered and open mall buildings* where the walls are not required by provisions elsewhere in the code to extend to the underside of the floor or roof sheathing, slab or deck above.
3. The duct system is constructed of *approved* materials in accordance with the International Mechanical Code and the duct penetrating the wall complies with all of the following requirements:
   - 3.1. The duct shall not exceed 100 square inches (0.06 m2).
   - 3.2. The duct shall be constructed of steel not less than 0.0217 inch (0.55 mm) in thickness.
   - 3.3. The duct shall not have openings that communicate the *corridor* with adjacent spaces or rooms.
   - 3.4. The duct shall be installed above a ceiling.
   - 3.5. The duct shall not terminate at a wall register in the fire-resistance-rated wall.
   - 3.6. A minimum 12-inch-long (305 mm) by 0.060-inch-thick (1.52 mm) steel sleeve shall be centered in each duct opening. The sleeve shall be secured to both sides of the wall and all four sides of the sleeve with minimum $1^1/_2$-inch by $1^1/_2$-inch by 0.060-inch (38 mm by 38 mm by 1.52 mm) steel retaining angles. The retaining angles shall be secured to the sleeve and the wall with No. 10 (M5) screws. The *annular space* between the steel sleeve and the wall opening shall be filled with *mineral wool* batting on all sides.
4. Such walls are penetrated by ducted HVAC systems, have a required *fire-resistance rating* of 1 hour or less, and are in buildings equipped throughout with an automatic sprinkler system in

accordance with Section 903.3.1.1 or 903.3.1.2. For the purposes of this exception, a ducted HVAC system shall be a duct system for conveying supply, return or exhaust air as part of the structure's HVAC system. Such a duct system shall be constructed of sheet steel not less than No. 26 gage thickness and shall be continuous from the air-handling appliance or equipment to the final branch connection to individual air outlet and inlet terminals. The final duct branches to the air inlets or outlets shall be accordance with Section 603 of the International Mechanical Code. .

2018 International Mechanical Code

Revise as follows:

[BF] 607.5.2 Fire barriers. Ducts and air transfer openings that penetrate fire barriers shall be protected with *listed* fire dampers installed in accordance with their listing. Ducts and air transfer openings shall not penetrate enclosures for interior exit stairways and ramps and exit passageways except as permitted by Sections 1023.5 and 1024.6, respectively, of the International Building Code.

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

1. Penetrations are tested in accordance with ASTM E119 or UL 263 as part of the fire-resistance-rated assembly.
2. Ducts are used as part of an *approved* smoke control system in accordance with Section 513 and where the fire damper would interfere with the operation of the smoke control system.
3. Such walls are penetrated by ducted HVAC systems, have a required fire-resistance rating of 1 hour or less, are in areas of other than Group H and are in buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2 of the International Building Code. For the purposes of this exception, a ducted HVAC system shall be a duct system for the structure's HVAC system. Such a duct system shall be constructed of sheet steel not less than 26 gage [0.0217 inch (0.55 mm)] thickness and shall be continuous from the air-handling *appliance* or *equipment* to the final branch connection to individual air outlet and inlet terminals. The final duct branches to the air inlets or outlets shall be accordance with Section 603.

[BF] 607.5.3 Fire partitions. Ducts and air transfer openings that penetrate fire partitions shall be protected with *listed* fire dampers installed in accordance with their listing.

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

1. Corridor walls in buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2 of the International Building Code and the duct is protected as a through penetration in accordance with Section 714 of the International Building Code.
2. The partitions are tenant partitions in covered and open mall buildings where the walls are not required by provisions elsewhere in the International Building Code to extend to the underside of the floor or roof sheathing, slab or deck above.
3. The duct system is constructed of *approved* materials in accordance with Section 603 and the duct penetrating the wall complies with all of the following requirements:
   - 3.1. The duct shall not exceed 100 square inches (0.06 m^2).
   - 3.2. The duct shall be constructed of steel not less than 0.0217 inch (0.55 mm) in thickness.
   - 3.3. The duct shall not have openings that communicate the corridor with adjacent spaces or rooms.
   - 3.4. The duct shall be installed above a ceiling.
   - 3.5. The duct shall not terminate at a wall register in the fire-resistance-rated wall.
   - 3.6. A minimum 12-inch-long (305 mm) by 0.060-inch-thick (1.52 mm) steel sleeve shall be centered in each duct opening. The sleeve shall be secured to both sides of the wall and all four sides of the sleeve with minimum $1^1/_2$-inch by $1^1/_2$-inch by 0.060-inch (38 mm by 38 mm by 1.52 mm) steel retaining angles. The retaining angles shall be secured to the sleeve and the wall with No. 10 (M5) screws. The annular space between the steel sleeve and the wall opening shall be filled with rock (mineral) wool batting on all sides.
4. Such walls are penetrated by ducted HVAC systems, have a required fire-resistance rating of 1 hour or less, and are in areas of other than Group H and are in buildings equipped throughout

with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2 of the International Building Code. For the purposes of this exception, a ducted HVAC system shall be a duct system for conveying supply, return or exhaust air as part of the structure's HVAC system. Such a duct system shall be constructed of sheet steel not less than 26 gage in thickness and shall be continuous from the air-handling appliance or equipment to the final branch connection to individual air outlet and inlet terminals. The final duct branches to the air inlets or outlets shall be accordance with Section 603.

Reason:

The exception as it now stands makes no sense. A 26 ga duct system can have unlimited openings immediately on both sides of a fire barrier or fire partition and not require a fire damper, as long as it continues to the equipment. But as soon as one of those openings has a flexible duct runout to a diffuser, for some reason a damper is required. There is no evidence that connecting a flexible duct to a sheet metal duct opening decreases the fire resistance of a wall penetrated by that duct.

This proposal will eliminate a major source of confusion and varying interpretations. The IBC and IMC commentaries have different interpretations, and a completely different interpretation was received via a staff technical question. Additional different interpretations have been enforced by local jurisdictions. As long as it is acceptable for a sheet metal duct with unlimited openings to penetrate a Fire Barrier or a Fire Partition without a fire damper, there is no reason those openings should not have flex duct on them.

IBC 717.7 prohibits the flexible duct itself from penetrating fire resistive construction.

Cost Impact

The code change proposal will decrease the cost of construction .

Many HVAC systems have flexible duct as the final branch run-out to grilles and diffusers. Under the current code language, these systems are not fully ducted, and therefore require fire dampers. This proposal will reduce the amount of dampers required in such systems in fully sprinklered buildings.

Internal ID: 1768

FS72-18

IBC: 718.2.1

Proponent: Tony Crimi, representing North American Insulation Manufacturers Association (NAIMA) (tcrimi@sympatico.ca)

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 in accordance with ASTM E119 or UL 263 for the specific application.

Reason:

This proposal harmonizes section 718.2.1 of the IBC with R302.11.1 of the IRC. In the 2018 cycle, this proposed language was added to the IRC, but not to the IBC.

The current Code language in the IBC not only lacks acceptance criteria, it also lacks a test method. Therefore, this proposal would ensure that testing of cellulose insulation for use as a fireblocking material is in accordance with ASTM E119 or UL 263. This proposal incorporates the test method identified by the proponents for evaluation of spray-applied cellulose insulation for use as fireblocking.

This clarifies the code requirement in a manner consistent with the language in IBC 718.2.1.3 and IRC R302.11.1.3, and prevents potentially unintended, or unsuitable, test methods from being used for these purposes. The proposal aims to provide more detail to the requirement to test cellulose insulation in accordance with the appropriate fire test standards. For the 2012 cycle, spray-applied cellulose was added to the list of acceptable fireblocking materials. The proponent's statement identified ASTM E119 as the test standard used by the Cellulose Insulation Manufacturers Association (CIMA) to conduct a variety of fireblocking fire tests. However, these Reports are not publicly available, so any modifications to the ASTM E119 procedure, or limitations identified in these reports, are not known.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

It modifies one option only, and is based on the original supporting information.

Internal ID: 1089

FS73-18

IBC: 718.2.1

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.

Internal ID: 944

FS74-18

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

Proponent: JC 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.

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

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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.

Internal ID: 1868

FS75-18

IBC: TABLE 721.1(1), 722.2.3.1

Proponent: Ali Fattah, City of San Diego, representing City of San Diego (afattah@sandiego.gov)

2018 International Building Code

Revise as follows:

TABLE 721.1(1)
MINIMUM PROTECTION OF STRUCTURAL PARTS BASED ON TIME PERIODS FOR VARIOUS NONCOMBUSTIBLE INSULATING MATERIALSm

Portions of table not shown remain unchanged.

STRUCTURAL PARTS TO BE PROTECTED	ITEM NUMBER	INSULATING MATERIAL USED	MINIMUM THICKNESS OF INSULATING MATERIAL FOR THE FOLLOWING FIRE-RESISTANCE PERIODS (inches)			
			4 hours	3 hours	2 hours	1 hour
4. Bonded or unbonded post-tensioned ten-dons in pre-stressedconcrete[e, i]	4-1.1	Carbonate, lightweight, sand-lightweight and siliceous[f] aggregate concreteUnrestrained members:	—	~~2~~	~~$1^1/_2$~~	—
		Solid slabs[h]				
		See Section 722.2.3.3.1 as well as Table 722.2.3(2)		$4^1/_2$	$2^1/_2$	$1^3/_4$
			3	$2^1/_2$	2	$1^1/_2$
		~~Beams and girders[j]~~				
		~~8" wide~~				
		~~greater than 12" wide~~				
	4-1.2	See Section 722.2.3.3.1 as well as Table 722.2.3(2) Carbonate, lightweight, sand-lightweight and siliceous aggregate	~~$1^1/_4$~~	~~1~~	~~$^3/_4$~~	—
		Restrained members:[k]				
		Solid slabs[h]	$2^1/_2$	2	$1^3/_4$	—
		Beams and girders[j]	2	$1^3/_4$	$1^1/_2$	—
		8" wide				
		greater than 12" wide				

For SI: 1 inch = 25.4 mm, 1 square inch = 645.2 mm^2, 1 cubic foot = 0.0283 m^3, 1 pound per cubic foot = 16.02 kg/m^3.

a. Reentrant parts of protected members to be filled solidly.

b. Two layers of equal thickness with a $^3/_4$-inch airspace between.

c. For all of the construction with gypsum wallboard described in Table 721.1(1), gypsum base for veneer plaster of the same size, thickness and core type shall be permitted to be substituted for gypsum wallboard, provided that attachment is identical to that specified for the wallboard and the joints on the face layer are reinforced, and the entire surface is covered with not less than $^1/_{16}$-inch gypsum veneer plaster.

d. An approved adhesive qualified under ASTM E119 or UL 263.

e. Where lightweight or sand-lightweight concrete having an oven-dry weight of 110 pounds per cubic foot or less is used, the tabulated minimum cover shall be permitted to be reduced 25 percent, except that the reduced cover shall be not less than $^3/_4$ inch in slabs or $1^1/_2$ inches in beams or girders.

f. For solid slabs of siliceous aggregate concrete, increase tendon cover 20 percent.

g. Adequate provisions against spalling shall be provided by U-shaped or hooped stirrups spaced not to exceed the depth of the member with a clear cover of 1 inch.

h. Prestressed slabs shall have a thickness not less than that required in Table 721.1(3) for the respective fire-resistance time period.

i. Fire coverage and end anchorages shall be as follows: Cover to the prestressing steel at the anchor shall be $^1/_2$ inch greater than that required away from the anchor. Minimum cover to steel-bearing plate shall be 1 inch in beams and $^3/_4$ inch in slabs.

j. For beam widths between 8 inches and 12 inches, cover thickness shall be permitted to be determined by interpolation.

k. Interior spans of continuous slabs, beams and girders shall be permitted to be considered restrained.

l. For use with concrete slabs having a comparable fire endurance where members are framed into the structure in such a manner as to provide equivalent performance to that of monolithic concrete construction.

m. Generic fire-resistance ratings (those not designated as PROPRIETARY* in the listing) in GA 600 shall be accepted as if herein listed.

n. Additional insulating material is not required on the exposed outside face of the column flange to achieve a 1-hour fire-resistance rating.

722.2.3.1 Slab cover. The minimum thickness of concrete cover to the positive moment reinforcement shall comply with Table 722.2.3(1) for reinforced concrete and Table 722.2.3(2) for prestressed concrete. These tables are applicable for solid or hollow-core one-way or two-way slabs with flat undersurfaces. These tables are applicable to slabs that are either cast in place or precast. For precast prestressed concrete not covered elsewhere, the procedures contained in PCI MNL 124 shall be acceptable. <u>Interior spans of continuous slabs, beams, and girders shall be permitted to be considered restrained. The required positive reinforcing shall be provided along the full length of the continuous tendon.</u>

Reason:

The proposed code change addresses a conflict in the IBC between the prescriptive fire resistance Tables for post tensioned concrete slabs in Table 721.1(1) and prescriptive tables in Section 722. Section 721 is intended to be prescriptive in nature where fire resistance is established based on reinforcing cover protecting post tensioned cables in slabs. Post tensioned cables are more temperature sensitive than mild solid reinforcing bars used in reinforced concrete slabs. Pre- stressed concrete is generally pre-cast concrete and is generally unrestrained. Various organizations such as the American Concrete Institute (ACI) and the Post-Tensioning Institute (PTI) consider cast in place post tensioned concrete to be pre-stressed concrete and as a result item #4 is labeled differently than my description.

Section 722 provides a calculated method for determining the fire resistance of various structural elements including PRESTRESSED CONCRETE FLOOR OR ROOF SLABS . A comparison of the reinforcing covers in Table 721.1(1) item # 4 with the required cover in Table 722.2.3(2) reveals that in many cases the second table is less restrictive and requires less reinforcing cover. Section 722.1 reference concrete standard ACI 216.1/TMS 0216 "Code Requirements for Determining Fire Resistance of Concrete and Masonry Construction Assemblies" and after researching the issue further

it became clear that Table 722.2.3(2) was adopted through transcription from Table 4.3.1.1 for pre-stressed slabs.

The differences in the tables occur with fire resistance ratings of 3 hours and higher for un-restrained and restrained slabs. Additionally, Table 4.3.1 of the ACI standard idealizes all cast in place slabs as restrained whereas footnote k in Table 721.1(1) states that " k. Interior spans of continuous slabs, beams and girders shall be permitted to be considered restrained." Section 722.2.3 is silent on restraint and Section 703.2.3 generically discuss restrained vs unrestrained and throws it on to the design professional to demonstrate a restrained condition.

The proposed code change seeks to modify item # 4-1.1 solid slabs to add a reference to Section 722.2.3.3.1 and Table 722.2.3.3(2) and strikes the covers required for solid slabs. Additionally, the proposed code change copies the text from Table 721.1(1) footnote K and adds the text to Section 722.2.3.1. Reinforcing tendons are continuous over several spans and as a result the required fire resistive cover bottom shall be required along the full length of the tendon.

Very few code users determine fire resistance in new buildings with post tensioned concrete slabs based on calculation and as a consequence this code change harmonizes the required covers for unrestrained pre-stressed or post tensioned concrete slabs.

The proposed code change can be considered editorial in nature.

Bibliography:

ACI/TMS 216.1-14 Code Requirements for Determining Fire Resistance of Concrete and Masonry Construction Assemblies, Chapter 4 https://www.concrete.org/Portals/0/Files/PDF/Previews/216_1-14.PREVIEW.pdf

The link was established on January 11, 2018

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

The proposed code change is editorial in nature and corrects a code conflict.

Internal ID: 926

FS76-18

IBC: TABLE 721.1(3)

Proponent: Tim Earl, representing The Gypsum Association (tearl@gbhinternational.com)

2018 International Building Code

Revise as follows:

TABLE 721.1(3)
MINIMUM PROTECTION FOR FLOOR AND ROOF SYSTEMSa, q

Portions of table not shown remain unchanged.

FLOOR OR ROOFCONSTRUCTION	ITEMNUMBER	CEILING CONSTRUCTION	THICKNESS OF FLOOR OR ROOF SLAB(inches)				MINIMUM THICKNESS OFCEILING (inches)			
			4 hours	3 hours	2 hours	1 hour	4 hours	3 hours	2 hours	1 hour
5. Reinforced concrete	5-1.1	Slab with suspended ceiling of vermiculite gypsum plaster over metal lath attached to $^{3}/_{4}$" cold-rolled channels spaced12" on center. Ceiling located 6" minimum below joists.	3	2	—	—	1	$^{3}/_{4}$	—	—
	5-2.1	~~$^{3}/_{8}$~~ $^{5}/_{8}$" Type X gypsum wallboard[c] attached to 0.018 inch (No.25 carbon sheet steel gage) by $^{7}/_{8}$" deep by $2^{5}/_{8}$" hat-shapedgalvanized steel channels with 1"-long No. 6 screws. The channels are spaced 24" on center, span 35" and are sup-ported along their length at 35" intervals by 0.033" (No. 21galvanized sheet gage) galvanized steel flat strap hangers having formed edges that engage the lips of the channel. The strap hangers are attached to the side of the concretejoists with $^{5}/_{32}$" by $1^{1}/_{4}$" long power-driven fasteners. Thewallboard is installed with the long dimension perpendicular to the channels. End joints occur on channels and sup-plementary channels are installed parallel to the mainchannels, 12" each side, at end joint occurrences. The finished ceiling is located approximately 12" below the soffitof the floor slab.	—	—	$2^{1}/_{2}$	—	—	—	$^{5}/_{8}$	—

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound = 0.454 kg, 1 cubic foot = 0.0283 m^3,

1 pound per square inch = 6.895 kPa, 1 pound per linear foot = 1.4882 kg/m.

a. Staples with equivalent holding power and penetration shall be permitted to be used as alternate fasteners to nails for attachment to wood framing.

b. Where the slab is in an unrestrained condition, minimum reinforcement cover shall be not less than $1^5/_8$ inches for 4 hours (siliceous aggregate only); $1^1/_4$ inches for 4 and 3 hours; 1 inch for 2 hours (siliceous aggregate only); and $^3/_4$ inch for all other restrained and unrestrained conditions.

c. For all of the construction with gypsum wallboard described in this table, gypsum base for veneer plaster of the same size, thickness and core type shall be permitted to be substituted for gypsum wallboard, provided that attachment is identical to that specified for the wallboard, and the joints on the face layer are reinforced and the entire surface is covered with not less than $^1/_{16}$-inch gypsum veneer plaster.

d. Slab thickness over steel joists measured at the joists for metal lath form and at the top of the form for steel form units.

e.

(a) The maximum allowable stress level for H-Series joists shall not exceed 22,000 psi.

(b) The allowable stress for K-Series joists shall not exceed 26,000 psi, the nominal depth of such joist shall be not less than 10 inches and the nominal joist weight shall be not less than 5 pounds per linear foot.

f. Cement plaster with 15 pounds of hydrated lime and 3 pounds of approved additives or admixtures per bag of cement.

g. Gypsum wallboard ceilings attached to steel framing shall be permitted to be suspended with $1^1/_2$-inch cold-formed carrying channels spaced 48 inches on center, that are suspended with No. 8 SWG galvanized wire hangers spaced 48 inches on center. Cross-furring channels are tied to the carrying channels with No. 18 SWG galvanized wire hangers spaced 48 inches on center. Cross-furring channels are tied to the carrying channels with No. 18 SWG galvanized wire (double strand) and spaced as required for direct attachment to the framing. This alternative is applicable to those steel framing assemblies recognized under Note q.

h. Six-inch hollow clay tile with 2-inch concrete slab above.

i. Four-inch hollow clay tile with $1^1/_2$-inch concrete slab above.

j. Thickness measured to bottom of steel form units.

k. Five-eighths inch of vermiculite gypsum plaster plus $^1/_2$ inch of approved vermiculite acoustical plastic.

l. Furring channels spaced 12 inches on center.

m. Double wood floor shall be permitted to be either of the following:

(a) Subfloor of 1-inch nominal boarding, a layer of asbestos paper weighing not less than 14 pounds per 100 square feet and a layer of 1-inch nominal tongue-and-groove finished flooring.

(b) Subfloor of 1-inch nominal tongue-and-groove boarding or $^{15}/_{32}$-inch wood structural panels with exterior glue and a layer of 1-inch nominal tongue-and-groove finished flooring or $^{19}/_{32}$-inch wood structural panel finish flooring or a layer of Type I Grade M-1 particleboard not less than $^5/_8$-inch thick.

n. The ceiling shall be permitted to be omitted over unusable space, and flooring shall be permitted to be omitted where unusable space occurs above.

o. For properties of cooler or wallboard nails, see ASTM C514, ASTM C547 or ASTM F1667.

p. Thickness measured on top of steel deck unit.

q. Generic fire-resistance ratings (those not designated as PROPRIETARY* in the listing) in the GA 600 shall be accepted as if herein listed.

Reason:

This is a typo. 3/8” type X boards are not readily commercially available. Generic 5/8” type X boards are readily available in the market. This change simply fixes this.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

This change simply corrects a typo, which will not affect construction costs.

Internal ID: 238

FS77-18

IBC: 722.1, 722.2.3.1, Chapter 35

Proponent: Stephen Skalko, Stephen V. Skalko, P.E. & Associates, LLC, representing Stephen V. Skalko, P.E. & Associates, LLC (svskalko@svskalko-pe.com); Jason Krohn, representing Precast/Prestressed Concrete Institute (jkrohn@pci.org)

2018 International Building Code

Revise as follows:

722.1 General. The provisions of this section contain procedures by which the *fire resistance* of specific materials or combinations of materials is established by calculations. These procedures apply only to the information contained in this section and shall not be otherwise used. The calculated *fire resistance* of ~~concrete~~ specific materials or combinations of materials shall be established by one of the following:

1. Concrete, concrete masonry and clay masonry assemblies shall be permitted in accordance with ACI 216.1/TMS 0216.
2. Precast and precast, prestressed concrete assemblies shall be permitted in accordance with PCI 124.
3. ~~The calculated fire resistance of~~ Steel assemblies shall be permitted in accordance with Chapter 5 of ASCE 29.
4. ~~The calculated fire resistance of~~ Exposed wood members and wood decking shall be permitted in accordance with Chapter 16 of ANSI/AWC National Design Specification for Wood Construction (NDS).

722.2.3.1 Slab cover. The minimum thickness of concrete cover to the positive moment reinforcement shall comply with Table 722.2.3(1) for reinforced concrete and Table 722.2.3(2) for prestressed concrete. These tables are applicable for solid or hollow-core one-way or two-way slabs with flat undersurfaces. These tables are applicable to slabs that are either cast in place or precast. For precast prestressed concrete not covered elsewhere, the procedures contained in PCI ~~MNL~~ 124 shall be acceptable.

Update standard(s) as follows:

PCI

Precast Prestressed Concrete Institute
200 West Adams Street, Suite 2100
Chicago IL 60606-6938
US

~~MNL~~ PCI 124-~~11~~18:

~~Design~~ Specification for Fire Resistance of Precast Prestressed Concrete

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Reason:

PCI MNL 124 was one of the first stand-alone technical documents developed for calculating the fire resistance of precast, prestressed concrete elements. The first edition was published in 1977 and was referenced in the legacy codes. The publication was updated in 1989 and again in 2011. It has been referenced in the International Building Code since the first edition of the IBC in 2000 with the 2011 edition referenced in the 2015 edition of the IBC. To make the document more useful to the design and code enforcement community, PCI has undertaken another revision to separate out code enforceable language from commentary and reformat the publication following ANSI-accredited standard development procedures.

PCI 124-18 is now a PCI consensus standard that provides a calculation method for determining the fire resistance of precast and precast, prestressed concrete elements and assemblies. In Section 722.2.3.1 PCI MNL 124 is presently referenced in the IBC for use in determining the cover to reinforcement in precast prestressed slabs. PCI 124-18 however also has provisions for determining the fire resistance for precast and precast, prestressed members and assemblies beyond just reinforcement cover for slabs.

This proposed code change adds PCI 124-18 to the list of acceptable calculation procedures in Section 722.1 for all precast and precast, prestressed concrete, not just slabs. The code change also formats the section to list individually all the acceptable calculation methods for concrete, masonry, steel and wood elements and assemblies.

Listing the methods in this manner will help the code user easily identify these methods the code allows to be used under Section 722.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

PCI 124 is the updated version of MNL 124, which is presently referenced in the IBC. But, PCI 124 is developed through an ANSI accredited consensus process, including using mandatory language for ease of enforcement. Code users who applied MNL 124 for determining fire resistance of precast and precast-prestressed concrete elements previously will be applying the same concepts to establish the fire resistances, thus the cost of construction should remain unchanged.

Analysis: A review of the standard proposed for inclusion in the code, PCI 124-18, 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. Under a previous number, MNL 124, this standard is already referenced. This proposal expands the use of the standard by reference and updates the number.

Internal ID: 1539

FS78-18

IBC: 722.2.3

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

Internal ID: 1371

FS79-18

IBC: 722.2.2.1.4 (New)

Proponent: Amy Trygestad, Concrete Reinforcing Steel Institute, representing Concrete Reinforcing Steel Institute (atrygestad@crsi.org); William Hall, Portland Cement Association, representing Alliance For Concrete Codes and Standards (jhall@cement.org); Stephen Szoke, American Concrete Institute, representing American concrete Institute (steve.szoke@concrete.org)

2018 International Building Code

Add new text as follows:

722.2.2.1.4 Flat plate concrete slabs with uniformly spaced hollow voids. Table 722.2.2.1 shall be used to determine the fire-resistance of 1 hour and 2 hours for flat plate concrete slabs with uniformly spaced hollow voids. The equivalent thickness of the slab shall be determined by dividing the net concrete volume of the slab by the floor area. The net concrete volume of the slab shall be equal to the volume of concrete of a solid slab minus the average concrete volume displaced by the hollow voids.

Reason:

The proposed subsection is to include prescriptive fire-resistance rating for flat plate concrete slabs with uniformly spaced hollow voids based on equivalent thickness.

In general, the equivalent thickness of a flat plate concrete slab with uniformly spaced hollow voids is equal to the net volume of concrete divided by the floor area. IBC Table 722.2.2.1 provides minimum slab thickness of reinforced concrete floor and roof assemblies to achieve fire-resistance ratings based on aggregate type. Flat plate concrete slabs with uniformly spaced hollow voids are similar to slabs with ribbed or undulating soffits, so an equivalent slab thickness must be calculated for use in Table 722.2.2.1.

To verify the system fire-resistance rating, a voided slab assembly was tested in accordance with the requirements of ASTM E119 in June 2017. The test assembly consisted of an 8-in.-thick normalweight concrete slab with siliceous aggregate, a design compressive strength of 5,000psi, and a cover of 3/4 in. to the main flexural reinforcing bars. The equivalent thickness was 5.9 in, calculated using the net concrete volume of the slab divided by the slab area.The edge of the slab on all 4 sides were supported vertically by the test frame, no restraint was provided for thermal expansion or rotation. As such, the assembly was unrestrained during the duration of the fire test, which is conservative for cast-in-place concrete slab systems.

The ASTM E119 test was terminated when the assembly reached the heat transmission end point at 2 hours 51 minutes, corresponding to a 2-hour fire-resistance rating. Throughout the duration of the test, the assembly supported the applied loading with no signs of collapse.Thus, the fire-resistance rating based on equivalent thickness is essentially the same as that determined from the fire test. The test is documented in the Test Report FC-891_R1.

In addition, numerous fire tests have been performed on similar voided slab assemblies in accordance with the provisions in Fire Behavior of Building Materials and Building Components; Definitions, Requirements and Tests (DIN 4102-02). The time-temperature curve used to test assemblies in the DIN requirements is essentially the same as that prescribed in Fire-Resistance Test - Elements of Building Construction - Part 1: General Requirements (ISO 834). ISO834 and ASTM E119 time-temperature curves are also essentially the same, and it has been shown that the differences in severity between the two tests are negligible.

Bibliography:

Test Report for Steel Reinforced Concrete Slab with Low Profile Recycled Plastic Voids , Test Report No. FC-891_R1, NGC Testing Services for Concrete Reinforcing Steel Institute, 2017

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

This is an optional fire-rated assembly available for use.

Internal ID: 655

FS80-18

IBC: TABLE 722.6.2(5)

Proponent: Rick Roos, representing Rockwool (richard.roos@roxul.com)

2018 International Building Code

Revise as follows:

TABLE 722.6.2(5)
TIME ASSIGNED FOR ADDITIONAL PROTECTION

DESCRIPTION OF ADDITIONAL PROTECTION	FIRE RESISTANCE (minutes)
~~Add to the fire-resistance rating of wood stud walls if the spaces between the studs are completely filled with glass fiber mineral wood batts weighing not less than 2 pounds per cubic foot (0.6 pound per square foot of wall surface) pr rockwool or slag material wool batts weighing not less then 3.3 pounds per cubic foot (1 pound per square foot of wall surface), or cellulose insulation having a normal density not less than 2.5 pounds per cubic foot.~~	~~15~~
Add to the fire-resistance rating of wood stud walls if the spaces between the studs are completely filled with mineral wool batts weighing not less than 0.86 pounds per cubic foot (0.25 pounds per square foot of wall surface.	15
Add to the fire-resistance rating of wood stud walls if spaces between the studs are completely filled with glass fiber batts weighing not less than 0.42 pounds per cubic foot (0.12 pounds per square foot of wall surface.	5
Add to the fire-resistance rating of wood stud walls if the spaces between the	10

studs are completely filled with cellulose insulation having a nominal density of not less than 3.12 pounds per cubic foot (0.91 pounds per square foot of wall surface.	

For SI: 1 pound/cubic foot = 16.0185 kg/m^3.

Reason:

This proposal aims to update Table 722.2.2(5) based on the most recent fire performance research data available. Research undertaken at the National Research Council of Canada involving over 20 new fire resistance tests of wall assemblies in accordance with the methodology of ASTM E119 and led the National Building Code of Canada (NBC) to differentiate between these three insulation materials. The calculation method for wood and steel light-frame construction, was introduced into the 1965 edition of the NBC and was based on fire test reports dated between 1932 and 1962. Like the US Building Codes, many of the original values were based on fire-resistance data generated over four decades ago on typical wall assemblies for that time. Subsequently, additional fire testing research was performed using construction materials, products and techniques that are currently in use. This provided many new insights into the fire resistance of current light-frame assemblies. Four major consortium projects on the fire resistance of wall (load and non-loadbearing) and floor/ceiling assemblies have been completed in recent years, as well as other smaller or related projects, providing data supporting the update and expansion of this Code. with new material and assemblies of materials, including new structural members. This also lead to revisions to the minimum density of insulation materials required to achieve these performance levels. This proposal is consistent with the current Canadian Building Code (NBC) as seen in the excerpt attached to this proposal.

Glass fiber, cellulose and mineral wool insulation materials have dramatically different high temperature performance. Glass fiber melts at 1050ºF and mineral wool melts at a temperature of 2080ºF, as shown in the image below. Cellulose fiber is made from wood fibers and is treated with flame retardants, and although combustible, it has more of an ability to stay in place than glass fiber insulation, which softens and melts, causing it to sag and create large voids between studs. This renders it ineffective as the fire exposure proceeds to higher temperatures.

Glass fiber insulation has been proven to have substantially less contribution to fire resistance than mineral wool and cellulose insulation. It contributes **only 5 minutes** toward the contribution to the overall fire resistance duration of wood stud wall assemblies. Cellulose has significantly more contribution than glass fiber insulation, providing **10 minutes** additional protection to wood stud wall systems.

In contrast, Mineral wool insulation contributes **15 minutes** toward the overall fire resistance of wood stud wall assemblies.

Excerpt from NBC Component Additive Method

Table D-2.3.4.-G
Time Assigned for Additional Protection

Description of Additional Protection	Time, min
Add to the fire-resistance rating of wood stud walls, sheathed with gypsum board or lath and plaster, if the spaces between the studs are filled with preformed insulation of rock or slag fibres conforming to CAN/ULC-S702, "Mineral Fibre Thermal Insulation for Buildings," and with a mass per unit area of not less than 1.22 kg/m² of wall surface	15(1)
Add to the fire-resistance rating of non-loadbearing wood stud walls, sheathed with gypsum board or lath and plaster, if the spaces between the studs are filled with preformed insulation of glass fibres conforming to CAN/ULC-S702, "Mineral Fibre Thermal Insulation for Buildings," and having a mass per unit area of not less than 0.6 kg/m² of wall surface	5(2)
Add to the fire-resistance rating of loadbearing wood stud walls sheathed with gypsum board if the spaces between the studs are filled with insulation of cellulose fibres conforming to CAN/ULC-S703, "Cellulose Fibre Insulation for Buildings," and having a density of not less than 50 kg/m³	10
Add to the fire-resistance rating of plaster on gypsum lath ceilings if 0.76 mm diam wire mesh with 25 mm by 25 mm openings or 1.57 mm diam diagonal wire reinforcing at 250 mm o.c. is placed between lath and plaster	30
Add to the fire-resistance rating of plaster on gypsum lath ceilings if 76 mm wide metal lath strips are placed over joints between lath and plaster	10
Add to the fire-resistance rating of plaster on 9.5 mm thick gypsum lath ceilings (Table D-2.3.4.-D) if supports for lath are 300 mm o.c.	10
Add to the fire-resistance rating of floor assemblies if the spaces between the structural members are filled with preformed insulation of rock or slag fibres conforming to CAN/ULC-S702, "Mineral Fibre Thermal Insulation for Buildings," and having a mass per unit area of not less than 1.22 kg/m² of floor surface	5(2)
Add to the fire-resistance rating of floor assemblies if the spaces between the structural members are filled with wet-blown cellulose fibres conforming to CAN/ULC-S703, "Cellulose Fibre Insulation for Buildings," and having a density of not less than 50 kg/m³	5(2)(3)
Add to the fire-resistance rating of floor assemblies where the floor topping on the unexposed side of the floor assemblies consists of concrete not less than 38 mm thick	5(2)

Notes to Table D-2.3.4.-G:

(1) Applies to wood-framed walls only.

(2) Applies to wood joists, wood trusses, wood I-joists and cold-formed-steel joists (C-shaped joists).

(3) Applies to cellulose fibre:

- (i) for wood joists, wood I-joist and wood trusses–that is spray-applied with a minimum density of 50 kg/m³, a minimum depth of 90 mm on the underside of the subfloor, and of 90 mm on the sides of the structural members;
- (ii) for cold-formed-steel joists–that is spray-applied with a minimum density of 50 kg/m³ and a minimum thickness of 90 mm on the underside of the subfloor, of 90 mm on the sides of the structural members, and of 13 mm on the underside of the bottom flange other than at resilient metal channel locations.

Bibliography:

2015 National Building Code of Canada - Division B, D-15

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

This proposal updates the Code to provide several options. The cost impact will ultimately depend on the choice of materials and the fire resistance rated assembly components.

Internal ID: 2103

FS81-18

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

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.

Internal ID: 945

FS82-18

IBC: 803.9, IFC 803.9

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

Revise as follows:

[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.

Internal ID: 309

FS83-18

IBC: 803.9

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.

Internal ID: 1502

FS84-18

IBC: 803.10

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

2018 International Building Code

Revise as follows:

803.10 Site-fabricated stretch systems. Where used as interior wall or interior ceiling finish materials, *site-fabricated stretch systems* containing all three components described in the definition in Chapter 2 shall be tested in the manner intended for use, and shall comply with the requirements of Section 803.1.1 ~~803.1.2.~~ or with the requirements of Class A in accordance with Section 803.1.2. If the materials are tested in accordance with ASTM E84 or UL 723, specimen preparation and mounting shall be in accordance with ASTM E2573.

2018 International Fire Code

Revise as follows:

[BF] 803.10 Site-fabricated stretch systems. Where used as newly installed interior wall or interior ceiling finish materials, site-fabricated stretch systems containing all three components described in the definition in Chapter 2 shall be tested in the manner intended for use, and shall comply with the requirements of Section 803.1.1 or ~~803.1.2.~~ with the requirements of Class A in accordance with Section 803.1.2. If the materials are tested in accordance with ASTM E84 or UL 723, specimen preparation and mounting shall be in accordance with ASTM E2573.

Reason:

This is clarification because interpretation is unclear but these systems were always intended to meet Class A in ASTM E84.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

Since this is meant at a clarification of intent the cost should not increase. However, due to the confusion on interpretation it is possible that different flame spread ratings have been required and this could have some effect on cost.

Internal ID: 291

FS85-18

IBC: TABLE 803.13

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 OCCUPANCY[k]

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.</u> <u>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.

FS86-18

IBC: [F] 806.9 (New)

Proponent: John Williams, Chair, representing Healthcare Committee (AHC@iccsafe.org); Michael O'Brian, Chair, representing FCAC (fcac@iccsafe.org)

2018 International Building Code

Add new text as follows:

[F] 806.9 Combustible lockers. Where lockers constructed of combustible materials are used, the lockers shall be considered to be interior finish and shall comply with Section 803.

Exception: Lockers constructed entirely of wood and noncombustible materials shall be permitted to be used wherever interior finish materials are required to meet a Class C classification in accordance with Section 803.1.2.

Reason:

The requirements in this section are contained in the IFC Section 808.4, but they should equally be contained in the IBC, because lockers are often included in building plans (such as in schools) and they should be checked at the time of issuing the certificate of occupancy instead of waiting until after the building is in use.

This proposal is submitted by the ICC Fire Code Action Committee (FCAC) and ICC Committee on Healthcare (CHC).

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/

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 not increase or decrease the cost of construction .

This is already in the IFC, so there is no technical change

Internal ID: 600

FS87-18

IBC: 909.20.5.1 (New)

Proponent: Douglas Evans, DHE FPE LLC, representing DHE FPE LLC (dhefpe@gmail.com)

2018 International Building Code

Add new text as follows:

909.20.5.1 Stair pressurization relief damper. A controlled relief vent capable of discharging a minimum of 2,500 cfm (1180 L/s) of air at the design pressure difference shall be located in the upper portion of the pressurized stair enclosure.

Reason:

The requirement for a dampered relief opening capable of discharging at least 2500 cfm allows a safety factor for stair pressurization to compensate for doors opening and closing. The dampered opening relieves excessive pressure when doors are opened and closed and reduces the potential for over pressurization. Further, if smoke does infiltrate the stair, the dampered relief allows smoke to vent to atmosphere.

This is an overpressure feature that only opens when the pressure in the stair sufficiently exceeds the required 0.10 inches of water pressure. This design constraint helps compensate for pressure differences created by stack effect by requiring fans to provide a slightly higher flow and pressure than needed. Depending on the height of the stair and design of the pressurization system, this option may even allow omission of pressure sensors and variable speed fans designed to compensate for stack effect conditions that vary through the year.

Cost Impact

The code change proposal will decrease the cost of construction .

This additional requirement is actually expected to decrease construction costs as described in the preceding justification statement.

Internal ID: 1630

FS88-18

IBC: 909.20, 909.20.4, 909.20.5, , 909.20.5.1, 909.20.5.2, 909.20.5.3, 909.20.6

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

2018 International Building Code

1023.11 Smokeproof enclosures. Where required by Section 403.5.4, 405.7.2 or 412.2.2.1, interior exit *stairways* and *ramps* shall be *smokeproof enclosures* in accordance with Section 909.20.

Revise as follows:

909.20 Smokeproof enclosures. Where required by Section 1023.11, a smokeproof enclosure shall be constructed in accordance with this section. A smokeproof enclosure shall consist of an *interior exit stairway* or *ramp* that is enclosed in accordance with the applicable provisions of Section 1023 and an open exterior balcony ~~or ventilated vestibule~~ meeting the requirements of this section. Where access to the roof is required by the International Fire Code, such access shall be from the smokeproof enclosure where a smokeproof enclosure is required.

Delete without substitution:

~~**909.20.4 Mechanical ventilation alternative.** The provisions of Sections 909.20.4.1 through 909.20.4.4 shall apply to ventilation of smokeproof enclosures by mechanical means.~~

~~**909.20.4.1 Vestibule doors.** The door assembly from the building into the vestibule shall be a *fire door assembly* complying with Section 716.2.2.1. The door assembly from the vestibule to the *stairway* or *ramp* shall not have less than a 20-minute *fire protection rating* and shall meet the requirements for a smoke door assembly in accordance with Section 716.2.2.1. The door shall be installed in accordance with NFPA 105.~~

~~**909.20.4.2 Vestibule ventilation.** The vestibule shall be supplied with not less than one air change per minute and the exhaust shall be not less than 150 percent of supply. Supply air shall enter and exhaust air shall discharge from the vestibule through separate, tightly constructed ducts used only for that purpose. Supply air shall enter the vestibule within 6 inches (152 mm) of the floor level. The top of the exhaust register shall be located at the top of the smoke trap but not more than 6 inches (152 mm) down from the top of the trap, and shall be entirely within the smoke trap area. Doors in the open position shall not obstruct duct openings. Duct openings with controlling *dampers* are permitted where necessary to meet the design requirements, but *dampers* are not otherwise required.~~

~~**909.20.4.2.1 Engineered ventilation system.** Where a specially engineered system is used, the system shall exhaust a quantity of air equal to not less than 90 air changes per hour from any vestibule in the emergency operation mode and shall be sized to handle three vestibules simultaneously. Smoke detectors shall be located at the floor-side entrance to each vestibule and shall activate the system for the affected vestibule. Smoke detectors shall be installed in accordance with Section 907.3.~~

~~**909.20.4.3 Smoke trap.** The vestibule ceiling shall be not less than 20 inches (508 mm) higher than the door opening into the vestibule to serve as a smoke and heat trap and to provide an upward-moving air column. The height shall not be decreased unless *approved* and justified by design and test.~~

~~**909.20.4.4 Stairway or ramp shaft air movement system.** The *stairway* or *ramp* shaft shall be provided with a dampered relief opening and supplied with sufficient air to maintain a minimum positive pressure of 0.10 inch of water (25 Pa) in the shaft relative to the vestibule with all doors closed.~~

Revise as follows:

909.20.5 Stairway and ramp pressurization alternative. Where the building is equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1, the vestibule is not required, provided that each interior *exit stairway* or *ramp* is pressurized to not less than 0.10 inch of water (25 Pa) and not more than 0.35 inches of water (87 Pa) in the shaft relative to the building measured with all *interior exit stairway* and *ramp* doors closed under maximum anticipated conditions of stack effect and wind effect. The activation of ventilating equipment required by this section shall be by smoke detectors installed at each floor level at an *approved* location at the entrance to the smokeproof enclosure. Smoke detectors shall be installed in accordance with Section 907.3.

Delete without substitution:

~~**909.20.6 Ventilating equipment.** The activation of ventilating equipment required by the alternatives in Sections 909.20.4 and 909.20.5 shall be by smoke detectors installed at each floor level at an *approved* location at the entrance to the smokeproof enclosure. When the closing device for the *stairway* and *ramp* shaft and vestibule doors is activated by smoke detection or power failure, the mechanical equipment shall activate and operate at the required performance levels. Smoke detectors shall be installed in accordance with Section 907.3.~~

Revise as follows:

~~**909.20.6.1**~~**909.20.5.1 Ventilation systems.** Smokeproof enclosure ventilation systems shall be independent of other building ventilation systems. The equipment, control wiring, power wiring and ductwork shall comply with one of the following:

1. Equipment, control wiring, power wiring and ductwork shall be located exterior to the building and directly connected to the smokeproof enclosure or connected to the smokeproof enclosure by ductwork enclosed by not less than 2-hour *fire barriers* constructed in accordance with Section 707 or *horizontal assemblies* constructed in accordance with Section 711, or both.
2. Equipment, control wiring, power wiring and ductwork shall be located within the smokeproof enclosure with intake or exhaust directly from and to the outside or through ductwork enclosed by not less than 2-hour *fire barriers* constructed in accordance with Section 707 or *horizontal assemblies* constructed in accordance with Section 711, or both.
3. Equipment, control wiring, power wiring and ductwork shall be located within the building if separated from the remainder of the building, including other mechanical equipment, by not less than 2-hour *fire barriers* constructed in accordance with Section 707 or *horizontal assemblies* constructed in accordance with Section 711, or both.

Exceptions:

1. Control wiring and power wiring located outside of a 2-hour fire barrier construction shall be protected using any one of the following methods:
   - 1.1. Cables used for survivability of required critical circuits shall be listed in accordance with UL 2196 and shall have a fire-resistance rating of not less than 2 hours.
   - 1.2. Where encased with not less than 2 inches (51 mm) of concrete.
   - 1.3. Electrical circuit protective systems shall have a fire-resistance rating of not less than 2 hours. Electrical circuit protective systems shall be installed in accordance with their listing requirements.

~~**909.20.6.2**~~**909.20.5.2 Standby power.** Mechanical vestibule and *stairway* and *ramp* shaft ventilation systems and automatic fire detection systems shall be provided with standby power in accordance with Section ~~2702.~~2702.

~~**909.20.6.3**~~**909.20.5.3 Acceptance and testing.** Before the mechanical equipment is *approved*, the system shall be tested in the presence of the *building official* to confirm that the system is operating in compliance with these requirements.

Reason:

The mechanical ventilation alternative for Interior exit stairways or ramps found in Section 909.20.4 is outdated. This option was a carry-over from the legacy codes and is rarely if ever used to reduce the risk of smoke contamination of a stair or ramp enclosure. When smokeproof enclosures are required by Section 1023.11 designers typically use pressurized stairways to prevent smoke from entering the stair or ramp enclosure thus vestibules are no longer required or used. It is unlikely that a smokeproof enclosure will be required in a nonsprinklered building, which is the only reason the mechanical ventilation alternative would ever be utilized. Also, with the current design requirements of 909.20.4, there is a potential risk associated with exhausting 150% of the makeup air from the vestibule thereby creating a negative pressure in the vestibule as it relates to adjacent spaces allowing smoke to enter the enclosure & the interior exit stairway or ramp.

This provision is rarely if ever used so why keep it in the code?

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

The mechanical ventilation alternative is not typically used so removing it from the code should have no financial impacts pro or con.

FS89-18

IBC: 909.20, 909.20.4, 909.20.6

Proponent: Douglas Evans, representing DHE FPE LLC (dhefpe@gmail.com)

2018 International Building Code

Revise as follows:

909.20 Smokeproof enclosures. Where required by Section 1023.11, a smokeproof enclosure shall be constructed in accordance with this section. A smokeproof enclosure shall consist of an *interior exit stairway* or *ramp* that is enclosed in accordance with the applicable provisions of Section 1023 and an open exterior balcony ~~or ventilated vestibule~~ meeting the requirements of this section. Where access to the roof is required by the International Fire Code, such access shall be from the smokeproof enclosure where a smokeproof enclosure is required.

Delete without substitution:

~~**909.20.4 Mechanical ventilation alternative.** The provisions of Sections 909.20.4.1 through 909.20.4.4 shall apply to ventilation of smokeproof enclosures by mechanical means.~~

~~**909.20.4.1 Vestibule doors.** The door assembly from the building into the vestibule shall be a *fire door assembly* complying with Section 716.2.2.1. The door assembly from the vestibule to the *stairway* or *ramp* shall not have less than a 20-minute *fire protection rating* and shall meet the requirements for a smoke door assembly in accordance with Section 716.2.2.1. The door shall be installed in accordance with NFPA 105.~~

~~**909.20.4.2 Vestibule ventilation.** The vestibule shall be supplied with not less than one air change per minute and the exhaust shall be not less than 150 percent of supply. Supply air shall enter and exhaust air shall discharge from the vestibule through separate, tightly constructed ducts used only for that purpose. Supply air shall enter the vestibule within 6 inches (152 mm) of the floor level. The top of the exhaust register shall be located at the top of the smoke trap but not more than 6 inches (152 mm) down from the top of the trap, and shall be entirely within the smoke trap area. Doors in the open position shall not obstruct duct openings. Duct openings with controlling *dampers* are permitted where necessary to meet the design requirements, but *dampers* are not otherwise required.~~

~~**909.20.4.2.1 Engineered ventilation system.** Where a specially engineered system is used, the system shall exhaust a quantity of air equal to not less than 90 air changes per hour from any vestibule in the emergency operation mode and shall be sized to handle three vestibules simultaneously. Smoke detectors shall be located at the floor-side entrance to each vestibule and shall activate the system for the affected vestibule. Smoke detectors shall be installed in accordance with Section 907.3.~~

~~**909.20.4.3 Smoke trap.** The vestibule ceiling shall be not less than 20 inches (508 mm) higher than the door opening into the vestibule to serve as a smoke and heat trap and to provide an upward-moving air column. The height shall not be decreased unless *approved* and justified by design and test.~~

~~**909.20.4.4 Stairway or ramp shaft air movement system.** The *stairway* or *ramp* shaft shall be provided with a dampered relief opening and supplied with sufficient air to maintain a minimum positive pressure of 0.10 inch of water (25 Pa) in the shaft relative to the vestibule with all doors closed.~~

Revise as follows:

909.20.6 Ventilating equipment. The activation of ventilating equipment required by the ~~alternatives~~ alternative in ~~Sections 909.20.4 and~~ Section 909.20.5 shall be by smoke detectors installed at each floor level at an *approved* location at the entrance to the smokeproof enclosure. When the closing device for the *stairway* and *ramp* shaft and vestibule doors is activated by smoke detection or power failure, the mechanical equipment shall activate and operate at the required performance levels. Smoke detectors shall be installed in accordance with Section 907.3.

Reason:

This proposal eliminates the mechanical ventilation alternative. Although the mechanical ventilation alternative has been in the IBC since inception, it seems unlikely this option is used very often, if at all. This is due to the complexity of the design and the additional equipment necessary to achieve the specified results.

There are two primary approaches to meet the mechanical ventilation option. One approach requires large supply and exhaust fans, as well as the associated ducts to serve all vestibules simultaneously. A second approach requires not

only the supply and exhaust ducts, but also one supply and one exhaust damper in each vestibule. With this approach, each damper in every vestibule will have to properly configure for the system to function.

Section 909.20.4.3 requires a minimum ceiling height of 20 inches above the door. With a minimum door opening height of 80 inches as required by Section 1010.1.1, these constraints dictate a minimum of 8 feet 4 inches from the top of one slab to the bottom of the slab above. Adding another 6 inches for a reasonable slab thickness gives almost 9 foot slab-to-slab height. Although this may not be a hardship for most multi-story buildings, this will impact some designs.

Cost Impact

The code change proposal will decrease the cost of construction .

Due to the complexity of this option, it is more expensive to design, construct, commission and maintain than other recognized approaches for smokeproof enclosures.

Internal ID: 1634

FS90-18

IBC: 909.20, 909.20.6 (New), 909.20.6.1 (New), 909.20.6.2 (New), 909.20.6.3 (New), 909.20.7

Proponent: Douglas Evans, representing DHE FPE LLC (dhefpe@gmail.com)

2018 International Building Code

Revise as follows:

909.20 Smokeproof enclosures. Where required by Section 1023.11, a smokeproof enclosure shall be constructed in accordance with this section. A smokeproof enclosure shall consist of an *interior exit stairway* or *ramp* that is enclosed in accordance with the applicable provisions of Section 1023 and an open exterior balcony ~~or~~ , ventilated vestibule or pressurized stair and pressurized entrance vestibule meeting the requirements of this section. Where access to the roof is required by the International Fire Code, such access shall be from the smokeproof enclosure where a smokeproof enclosure is required.

Add new text as follows:

909.20.6 Pressurized stair and vestibule alternative. The provisions of Sections 909.20.6.1 through 909.20.6.3 shall apply to smokeproof enclosures using a pressurized stair and pressurized entrance vestibule.

909.20.6.1 Vestibule doors. The door assembly from the building into the vestibule shall be a fire door assembly complying with Section 716.2.2.1. The door assembly from the vestibule to the stairway shall not have less than a 20-minute fire protection rating and meet the requirements for a smoke door assembly in accordance with Section 716.2.2.1. The door shall be installed in accordance with NFPA 105.

909.20.6.2 Pressure difference. The stair enclosure shall be pressurized to a minimum of 0.05 inch of water gage (12.44 Pa) positive pressure relative to the vestibule with all stairway doors closed under the maximum anticipated stack pressures. The vestibule, with doors closed, shall have a minimum of 0.05 inch of water gage (12.44 Pa) positive pressure relative to the fire floor. The pressure difference across doors shall not exceed 30 lbs (133-N) maximum force to begin opening the door.

909.20.6.3 Dampered relief opening. A controlled relief vent capable of discharging a minimum of 2,500 cfm (1180 L/s) of air at the design pressure difference shall be located in the upper portion of the pressurized exit enclosure.

Revise as follows:

~~909.20.6~~909.20.7 Ventilating equipment. The activation of ventilating equipment required by the alternatives in Sections 909.20.4, 909.20.5 and ~~909.20.5~~ 909.20.6 shall be by smoke detectors installed at each floor level at an *approved* location at the entrance to the smokeproof enclosure. When the closing device for the *stairway* and *ramp* shaft and vestibule doors is activated by smoke detection or power failure, the mechanical equipment shall activate and operate at the required performance levels. Smoke detectors shall be installed in accordance with Section 907.3.

Reason:

This amendment will allow the use of a pressurized stair along with a pressurized entrance vestibule as one of the options for smokeproof enclosures. The pressurized stair and vestibule option has been used in Southern Nevada for over 20 years and has a proven track record. This proposal allows the existing options to remain, but also allows a pressurized stair and vestibule as another option. This proposal has been shown to work well for high-rise buildings where outdoor air temperatures cause stack effect conditions. Due to potentially excessive stack effect pressures, the stair pressurization alternative outlined in Section 909.20.5 can be difficult to implement. This proposal provides an option for designers when dealing with tall buildings.

This option essentially creates an “air lock” between the pressurized stair and normally occupied portion(s) of the building, which makes it easier to achieve the 0.10 between the stair and building without over pressurizing the stair. Leakage under/around the door separating the stair from the vestibule has been found to be sufficient to pressurize vestibules without additional ducts or fans. At times, an adjustable door sweep is used to regulate leakage and meet the associated pressure requirements.

This option is less expensive to design, construct, commission and maintain than the ventilated vestibule option. It can be a viable option for tall stairs and reduces the impact of stack effect. The stair pressurization (w/o vestibule) option is difficult to implement in tall buildings due to pressure differences created by stack effect.

Cost Impact

The code change proposal will decrease the cost of construction .

This proposal allows an additional option for smokeproof enclosures and can reduce overall cost during design, construction, commissioning and continued building maintenance.

Internal ID: 1637

FS91-18

IBC: 1402.2

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.

Internal ID: 2144

FS92-18

IBC: 1402.2

Proponent: Benjamin Meyer, representing self (2ben.meyer@gmail.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.

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.~~1. 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:

1.1. ~~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.

1.2. ~~2.2.~~*Exterior wall envelope* test assemblies shall be not less than 4 feet by 8 feet (1219 mm by 2438 mm) in size.

1.3. ~~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).

1.4. ~~2.4.~~*Exterior wall envelope* assemblies shall be subjected to a minimum test exposure duration of 2 hours.

The *exterior wall envelope* design shall be considered to resist wind-driven rain where the results of testing indicate that water did not penetrate control joints in the *exterior wall envelope*, joints at the perimeter of openings or intersections of terminations with dissimilar materials.

2. ~~3.~~*Exterior insulation and finish systems* (EIFS) complying with Section 1407.4.1.

Reason:

Conformance with the material and structural requirements described in chapters 19 and 21 do not directly correspond with the water management (WRB) performance specified in 1402.2.

For example Chapter 21 contains structural requirements for Dry-Stack Masonry (2114). Compliance with these requirements in no way ensures complies with 1402.2.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

proposal doesn't add requirements

Internal ID: 2388

FS93-18

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

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.

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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

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.

Internal ID: 1017

FS94-18

IBC: 1402.3 (New)

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.

Internal ID: 1168

FS95-18

IBC: 1402.5 (New)

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.

Internal ID: 1047

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

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

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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.

Internal ID: 1827

FS97-18

IBC: 1402.5 (New), 1402.5.1 (New)

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

1402.5.1 Projections or inside corners. Where the exterior wall contains projections or inside corners, fire testing shall be conducted to demonstrate that the projections or inside corners will not negatively affect the fire safety of the exterior wall envelope. Such testing shall be related to the actual end-use configuration and be performed on the finished manufactured assembly in the maximum thickness intended for use. Assemblies tested shall include seams, joints and other typical details used in the installation of the assembly and shall be tested in the manner intended for use.

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.

The reason fire testing of exterior wall envelopes is needed is because they can cause high fire losses (especially in terms of victims) and some examples are shown in the bibliography.

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 does not address any added requirements in the case of the presence of projections or interior corners. That provides a simpler approach, particularly in view of the fact that it is difficult to define exactly what level of projections or corners would trigger the requirement.

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) in 2017.

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.

Evidence exists that fires in exterior wall envelopes containing projections or inside corners may present additional fire hazard and, for that reason, a section requiring specialized testing is being proposed to be added. Standard tests can be modified or specific tests can be used to investigate the effects of such constructions on fire safety.

Bibliography:

Some links to the Grenfell tower fire in 2017 (with at least 71 fire fatalities) follow:

http://www.bbc.com/news/uk-40301289 - accessed January 10 2018

http://www.bbc.com/news/uk-england-london-40272168 - accessed January 10, 2018

https://en.wikipedia.org/wiki/Grenfell_Tower_fire - accessed January 10, 2018

Some links to other fires in very tall buildings throughout the world follow:

http://www.telegraph.co.uk/news/worldnews/middleeast/dubai/12076792/Dubai-skyscraper-fire-new-years-eve-2015-live.html - accessed January 10, 2018

http://www.bbc.com/news/world-middle-east-31562099 -accessed January 10, 2018

https://www.nytimes.com/2017/08/03/world/middleeast/torch-tower-dubai-fire.html - accessed January 10, 2018

http://www.nytimes.com/2009/02/10/world/asia/10beijing.html - accessed January 10, 2018

https://www.thebeijinger.com/blog/2014/02/09/five-years-ago-today-cctv-hotel-tower-burns - accessed January 10, 2018

Other high rise fires:

Mermoz Tower, Roubaix, France May 2012. (2013): "l'incendie tour mermoz pompiers de Roubaix" [Movie]. YouTube; 2013 [cited 2013 19 July 2013]. Footage of Mermoz Tower Fire, Roubaix, France]. Available from: http://www.youtube.com/watch?v=j4mIBQnUAfQ.47. (2012) - "Spectacular High-Rise Fire in France" 2012 [cited 2013 19 July 2013]. Blog report on Mermoz Tower fire, Roubaix, France]. Available from: http://firegeezer.com/2012/05/15/spectacular-high-rise-fire-in-france/.48. (2012) - "High-rise blaze in 18-storey block in Roubaix, France " 2012 [cited 2013 19 July 2013]. Blog report on Mermoz Tower fire, Roubaix]. Available from: http://www.blog.plumis.co.uk/2012/05/high-rise-blaze-in-18-storey-block-in.html.

web-sites accessed January 10, 2018

A fire occurred in a 7 storey apartment building in Berlin Germany on 21 April 2005 (Broemme, A. (2005) "Berlin: Verheerender Fassadenbrand". Deutsche Feuerwehr-Zeitung Brandschutz. 2005 August, 2005.;number 6.) - website accessed January 10, 2018

Cost Impact

The code change proposal will increase the cost of construction .

It is possible that some exterior wall envelopes are not being tested at present. In that case, the cost of construction would be increased.

Internal ID: 791

FS98-18

IBC: 1402.5 (New),

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

2018 International Building Code

Add new text as follows:

1402.5 Water-resistive barriers. 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 complies with the following:
   - 2.1. 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 when tested, on specimens at the thickness intended for use, in accordance with ASTM E 1354, in the horizontal orientation and at an incident radiant heat flux of 50 kW/m^2.
   - 2.2. A flame spread index of 25 or less and a smoke-developed index of 450 or less as determined in accordance with ASTM E 84 or UL 723, with test specimen preparation and mounting in accordance with ASTM E 2404.

Delete without substitution:

~~**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.~~

Reason:

The water resistive barrier needs to meet two fire tests and they are somewhat garbled in this section and the proposed wording separates them out, placing the test to ASTM E1354 first and the test to ASTM E84 separately second. Also, when testing water resistive barriers in accordance with ASTM E84 the standard practice ASTM E2404 needs to be used, as made clear in the test method with the revisions developed by ASTM for ASTM E2404. This is consistent with the way that many other uses of ASTM E84 are indicated in chapter 8, for example.

This proposal is clarification of the language in the code because the scope of ASTM E2404 was expanded since the approval of the language in the 2018 code.

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 is simply a clarification of the required testing procedures.

Internal ID: 387

FS99-18

IBC: 1402.5, 1402.5.1 (New), Table 1402.5 (New)

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 at 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.

Internal ID: 2346

FS100-18

IBC: 1402.5

Proponent: William Hall, Portland Cement Association, representing Alliance For Concrete Codes and Standards (jhall@cement.org); Jason Thompson, representing Masonry Alliance for Codes and Standards (jthompson@ncma.org)

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. The NFPA 285 test shall be conducted with an airflow velocity of 4.5 m/s (10 mph) applied perpendicular to the exterior face of the test specimen. The airflow velocity shall be measured at the exterior surface of the test specimen and one foot above the top of the test specimen window opening. For the purposes of this section, *fenestrationfenestrationwater-resistive-barrier* 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.

Reason:

It is common knowledge that air movement can intensify fire effects and spread fire. Ask any Boy Scout how they help the fire grow when using a campground fire pit for cooking. Or watch the news regarding the spread of wildfires through communities. Airflow does accelerate fire. But the question is by how much? That question remains un-answered even though we rely on exterior fire testing to assure there is not fire spread up the side of the building possibly resulting in a conflagration. The requirement for NFPA 285 testing in the IBC currently begins at 40 ft. of building height. The test is performed by placing a burner inside the test apparatus compartment and another burner at a window opening in the test specimen to simulate a room fire. The combination of the burners helps form a fire plume beginning at the top of window opening. Distance of fire spread as well rate of fire spread up the exterior wall is recorded and determined whether it meets the pass-fail criteria. This proposal would require that the test also include an air velocity of 4.5 m/s (10 mph) measured on the exterior wall test specimen surface at one foot above the opening and perpendicular to the wall. This would enable the proponents of products used in exterior wall assemblies to determine if their product is negatively impacted from a wind perspective during the test.. If the assembly fails further development of the assembly would be required.

A prevailing wind at a height of 40 ft. is common in any area of the country and provides reasoning that these assemblies should be tested in an environment that more closely resembles the intended application. Until, and unless standard development organizations incorporate provisions such as this into editions of standards, providing a wind component in the building code assures proper consideration of wind effects to fire spread on exterior walls assemblies required to be tested to NFPA 285

Cost Impact

The code change proposal will increase the cost of construction .

To pin point the increased cost of construction this proposal is difficult due to the costs being very dependant on the material the user intends to use. Air velocity will not affect many materials but will affect some.

Internal ID: 1546

FS101-18

IBC: 1402.5

Proponent: Andy Williams, Metal Construction Association, representing Metal Construction Association (afwilliams@Connect2amc.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~~:

1. Laminate and composite panels that are manufactured using a combustible adhesive shall be considered as a combustible exterior wall element.
2. *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.

Reason:

This text is being proposed to recognize that laminate or composite panels utilizing a combustible adhesive are adding combustibles to the exterior wall cladding and should be regulated in accordance with NFPA 285 Standard Fire Test Method for Evaluation of **Fire Propagation** Characteristics of Exterior Non-Load-Bearing Wall Assemblies Containing **Combustible Components.** While not high in volume, the only material separating these combustible adhesives from a fire is the exterior metal skin which is often only a thin layer of aluminum. Once the metal skin is penetrated by fire, the concern is that flames will spread rapidly through this untested material. There is no test criteria for the flame spread performance of the combustible adhesive in 703.5.2.

This change is proposed for Chapter 14 because this is an issue specific to Exterior Walls. There is no intent to address composite and laminate materials used for other applications that are not typically limited based on performance in NFPA 285.

The motivation for this proposal is to eliminate the potential for additional high rise cladding fires for panel systems that have not been tested to NFPA 285.

The current code makes an exception for the combustibles contained in the WRB (1402.5 Exception 1 and Exception 2). This panel type adds to the level of combustibles in the wall assembly and should be tested to show that there is no additional hazard for flame spread through the exterior wall assembly.

Typical panels have a noncombustible core with a layer of metal held on by a combustible adhesive. Two examples are shown below.

Corrugated Core (End View)

Upper Section - Cut away view of honeycomb core, combustible adhesive, with exterior aluminum skin

Lower Section - Same panel with exterior aluminum skin removed.

While there are other types of panels with alternate noncombustible cores and attached facers, the performance question is regarding the ability of the combustible adhesive to spread flame in a fire situation. This can only be done through recognized testing - in this case NFPA 285.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

Cost of NFPA 285 testing would be added to the overall cost of this product. Similar cost addition as other combustible wall assemblies.

Internal ID: 1378

FS102-18

IBC: 1402.5

Proponent: Bob Zabcik, representing Metal Construction Association (bobz@ncilp.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 either a combustible *water-resistive barrier* or a combustible adhesive 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.

Reason:

Composite or laminate panels, whether assembled in the field or factory, are often made out of primary materials which are considered to be non-combustible. However, when these materials are assembled with adhesives that may contribute to the flame spread and potential heat of the wall assembly, then testing such as NFPA 285 should be required. That is exactly the purpose of this passage in the context of Weather Resistive Barriers.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

The certification and testing costs of the subject products may increase.

Internal ID: 1914

FS103-18

IBC: 1402.5

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.

Internal ID: 2058

FS104-18

IBC: 1402.5

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.

Internal ID: 933

FS105-18

IBC: 1402.5

Proponent: Benjamin Meyer, representing self (2ben.meyer@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. Water-resistive barriers complying with Section 703.5.2.

Reason:

The refernce code section can be applied to a WRB material on certain substrates. This exception simplifies other exceptions in the WRB section, while still meeting the stringency and intent of non-combustibility.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

Alternate compliance and testing method which already exists in the code.

Internal ID: 2391

FS106-18

IBC: 1403.2

Proponent: Jay Crandell, P.E., ARES Consulting, representing Foam Sheathing Committee of the American Chemistry Council

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, shall provide a continuous water-resistive barrier behind the exterior wall veneer. No.15 asphalt felt shall be attached to the studs or sheathing and applied horizontally with the upper layer lapped over the lower layer not less than 2 inches (51 mm). Where vertical joints occur, No.15 asphalt felt shall be lapped not less than 6 inches (152 mm). Other approved water-resistive barrier materials shall be installed in accordance with the water-resistive barrier manufacturer's installation instructions. The No.15 asphalt felt or other approved water-resistive barrier material shall be continuous to the top of walls and terminated at penetrations and building appendages with flashing as described in Section ~~1404.4, in such a manner as to provide a continuous~~ 1404.4. The water-resistive barrier ~~behind the *exterior wall* veneer.~~ installation shall comply with the requirements for weather protection of the exterior wall envelope as described in Section 1402.2.

Reason:

This proposal better correlates the IBC with language in the 2018 IRC (Section R703.2) that provides additional clarity of intent and requirements. In particular, IBC Section 1403.2 is missing basic minimum installation requirements for No.15 asphalt felt. In addition, the 2018 IRC recognizes that other approved materials must be installed in accordance with the manufacturer's installation instructions since they often or necessarily vary from the basic minimum installation requirements for No.15 asphalt felt. Finally, the last phrase of the existing paragraph has been incorporated in the first sentence because it relates to the overall objective of the paragraph and should not be an afterthought.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

The code change proposal clarifies the provision and correlates with similar language in the IRC with no change in requirements or cost.

Internal ID: 984

FS107-18

IBC: 1403.2

Proponent: John Woestman, Kellen Co., representing Extruded Polystyrene Foam Association (XPSA) (jwoestman@kellencompany.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, 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. Other approved water-resistive barrier materials shall be installed in accordance with the water-resistive barrier manufacturer's installation instructions.

Reason:

This proposal adds a sentence that was added to the 2018 IRC (Section R703.2) but was not coordinated with the 2018 IBC. The purpose is to ensure that, for alternative water-resistive barrier materials, the manufacturer's installation instructions are the basis for installation as they may necessarily vary from the typical minimum installation practice used for Type 1 felt.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

This proposal is a clarification and does not add cost.

Internal ID: 986

FS108-18

IBC: 1403.2

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.

Internal ID: 1319

FS109-18

IBC: 1403.3

Proponent: William Hall, Portland Cement Association, representing Alliance For Concrete Codes and Standards (jhall@cement.org); Jason Thompson, National Concrete Masonry Association, representing Masonry Alliance for Codes and Standards (jthompson@ncma.org)

2018 International Building Code

Revise as follows:

[BS] 1403.3 Wood. *Exterior walls* of wood construction shall be designed and constructed in accordance with Chapter 23~~.~~ and Section 1402.5.

Reason:

This proposal is intended to clarify the code by adding a pointer back to Section 1402.5 to require NFPA 285 testing on construction types other than Type V greater than 40ft. in height which incorporate a combustible water resistive barrier.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

This provision is currently required in the code.

Internal ID: 616

FS110-18

IBC: 1403.8

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

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.

Internal ID: 389

FS111-18

IBC: 1403.12

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.

Internal ID: 388

FS112-18

IBC: 1403.12, 1403.12.2

Proponent: Matthew Dobson, Vinyl Siding Institute, representing Vinyl Siding Institute (mdobson@vinylsiding.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 comply with Section 1403.12.1 or 1403.12.2. *Polypropylene siding* 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.

1403.12.2 Fire separation distance. ~~The~~ Polypropylene siding shall not be installed on walls with a fire separation distance ~~between a building with *polypropylene siding* and the adjacent building shall be not~~ of less than ~~10~~ 5 feet (~~3048~~ 1524 mm).

Reason:

This change does not change the intent of the code but improves then language in the following ways:

-Editorial in first paragraph.

-Makes the requirement more consistent in with the language currently in the IRC.

-Makes it consistent with how the I-codes fundamentally treat fire separation distance, as a measurement to property line and requirements for wall performance. The way the code’s is written is confusing and not appropriate. The code does not necessarily measure fire separation distance between buildings except in specific situations. Buildings are definitely not measured with a fire separation distance, this measurement is for walls exclusively in the I-codes.

It’s worth looking at the definition:

FIRE SEPARATION DISTANCE. The distance measured from the building face to one of the following:1. The closest interior lot line.2. To the centerline of a street, an alley or public way.3. To an imaginary line between two buildings on the lot.The distance shall be measured at right angles from the face of the wall.

In general this is not a change in requirements and limitations.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

This change is a clarification of how fire separation is measured and will not have any cost impact.

Internal ID: 834

FS113-18

IBC: 1403.14 (New)

Proponent: Jay Crandell, P.E., ARES Consulting, representing Foam Sheathing Committee of the American Chemistry Council

2018 International Building Code

Add new text as follows:

1403.14 Attachments through Insulation. Exterior wall coverings attached to the building structure through foam plastic insulating sheathing shall comply with the attachment requirements of Section 2603.11, 2603.12, or 2603.13.

Reason:

In the last two code cycles, Chapter 26 was revised to address cladding attachment requirements for cases where the cladding attachments pass through a layer of foam plastic insulating sheathing. However, those revisions occurred during the structural committee hearings (Group B) and did not allow coordination with sections in Chapter 14 assigned to the fire safety committee (Group A). This proposal is a follow-up to ensure that provisions in Chapter 14 which deal with installation of wall coverings are linked to special attachment requirements in three sections of Chapter 26 for cases where cladding attachments must be integrated with use of foam plastic insulating sheathing on the exterior of buildings. The language is added to Section 1403.13 because the referenced requirements are related to use of foam plastic insulation materials and are generally applicable to many cladding types in Section 1404; therefore, this approach avoids redundant references that would otherwise need to occur for each cladding type.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

This proposal cross references and clarifies application of requirements already in the code.

Internal ID: 980

FS114-18

IBC: 202 (New), 1403.13 (New), Chapter 35

Proponent: Matthew Dobson, VSI, representing Vinyl Siding Institute (mdobson@vinylsiding.org)

2018 International Building Code

SECTION 202 DEFINITIONS

Add new definition as follows:

INSULATED VINYL SIDING. A cladding product, with manufacturer-installed foam plastic insulating material as an integral part of the cladding product, having a thermal resistance of not less than R-2.

Add new text as follows:

1403.13 Insulated vinyl siding. Insulated vinyl siding shall be certified and labeled as conforming to the requirements of ASTM D7793 by an approved quality control agency.

Add new standard(s) follows:

ASTM

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

D7793-17:

Standard Specification for Insulated Vinyl Siding.

Reason:

This proposal introduces a product category that has been in the market for over 20 years and was standardized over 5 years ago. During the last cycle insulated vinyl siding was not allowed in the IBC (even though it is recognized in the IRC and the Energy Code), and the main reason provided was that the product should be tested as one assembly for flame spread and smoke developed index.

Insulated vinyl siding should be treated the same as any other cladding and insulation products. According to the IBC, cladding does not require flame spread testing or smoke developed index testing, except in applications where the product might be considered an interior finish, e.g. breezeways of apartments. Of course, the foam plastic needs to meet the requirements of Chapter 26 of the IBC and the product standard requires this testing in accordance with the IBC and IRC.

The IBC has provisions in place for cladding when used in certain density settings and when used with non-combustible construction. The previous argument used is not valid because it places additional requirements on one type of cladding product when there are many other cladding systems that would not be required to be tested similarly. Additionally, when insulated vinyl siding needs to be tested as a whole assembly in high density settings, it can pass the E119 test.

Insulated vinyl siding has proven to be safe for the past twenty years, and with this proposal we submit examples of several products approved for use in higher density settings as part of an E119 1-hour rated assembly. Insulated vinyl siding has also been approved for use in urban wildland interface settings in California via the CA SFM 12-7A-1 test. Also submitted is code compliance report where it specifies insulated vinyl siding is allowed for use in the IBC, and has been for years. Information has been included as attachments.

By recognizing the product standard, developed through the ASTM standard making process in 2010-2012, the code is simply staying up-to-date with recognition of the proper standard – providing accurate information to building officials on a well-performing product that also contributes to energy efficiency.

Cost Impact

The code change proposal will decrease the cost of construction .

By adding this reference into the IBC it will help to reduce some of the additional regulatory costs associated with product standards not recognized by the building code.

Analysis: A review of the standard proposed for inclusion in the code, ASTM D7793-17, 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.

Internal ID: 830

FS115-18

IBC: TABLE 1404.2

Proponent: Jason Thompson, National Concrete Masonry Association, representing Masonry Alliance for Codes and Standards (jthompson@ncma.org)

2018 International Building Code

Revise as follows:

TABLE 1404.2
MINIMUM THICKNESS OF WEATHER COVERINGS

COVERING TYPE	MINIMUM THICKNESS (inches)
Adhered masonry veneer	
Architectureal cast stone	0.75
Other	0.25
Aluminum siding	0.019
Anchored masonry veneer	
Stone (natural)	2.0
Architectural cast stone	~~1.25~~ 2.5
Other	2.625
Asbestos-cement boards	0.125
Asbestos shingles	0.156
Cold-rolled copper[d]	0.0216 nominal
Copper shingles[d]	0.0162 nominal
Exterior plywood (with sheathing)	0.313
Exterior plywood (without sheathing)	See Section 2304.6
Fiber cement lap siding	0.25[c]
Fiber cement panel siding	0.25[c]
Fiberboard siding	0.5
Glass-fiber reinforced concrete panels	0.375
Hardboard siding[c]	0.25
High-yield copper[d]	0.0162 nominal
Lead-coated copper[d]	0.0216 nominal
Lead-coated high-yield copper	0.0162 nominal
Marble slabs	1
Particleboard (with sheathing)	See Section 2304.6
Particleboard (without sheathing)	See Section 2304.6
Porcelain tile	0.25
Steel (approved corrosion resistant)	0.0149
Structural glass	0.344
Stucco or exterior cement plaster	
Three-coat work over:	
Metal plaster base	0.875[b]
Unit masonry	0.625[b]
Cast-in-place or precast concrete	0.625[b]
Two-coat work over:	
Unit masonry	0.5[b]
Cast-in-place or precast concrete	0.375[b]
Terra cotta (anchored)	1
Terra cotta (adhered)	0.25
Vinyl siding	0.035
Wood shingles	0.375
Wood siding (without sheathing)[a]	0.5

For SI: 1 inch = 25.4 mm, 1 ounce = 28.35 g, 1 square foot = 0.093 m^2.

a. Wood siding of thicknesses less than 0.5 inch shall be placed over sheathing that conforms to Section 2304.6.

b. Exclusive of texture.

c. As measured at the bottom of decorative grooves.

d. 16 ounces per square foot for cold-rolled copper and lead-coated copper, 12 ounces per square foot for copper shingles, high-yield copper and lead-coated high-yield copper.

Reason:

Industry standards and recommendations have set the minimum thickness of anchored cast stone veneer at 2.5 inches for decades. This minimum thickness is necessary to ensure there is sufficient engagement of the veneer anchor embedded in the mortar bed joint to provide later support of the veneer as well as provide the necessary cover depth for corrosion protection of the veneer anchor.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

This change will bring the IBC requirements in line with already established industry standards and practices being used.

Internal ID: 2016

FS116-18

IBC: TABLE 1404.2

Proponent: Jason Thompson, National Concrete Masonry Association, representing Masonry Alliance for Codes and Standards (jthompson@ncma.org)

2018 International Building Code

Revise as follows:

TABLE 1404.2
MINIMUM THICKNESS OF WEATHER COVERINGS

COVERING TYPE	MINIMUM THICKNESS (inches)
Adhered masonry veneer ~~Architectureal cast stone~~ ~~Other~~	0.25 ~~0.75~~ ~~0.25~~
Aluminum siding	0.019
Anchored masonry veneer Stone (natural) Architectural cast stone Other	2.0 1.25 2.625
Asbestos-cement boards	0.125
Asbestos shingles	0.156
Cold-rolled copper[d]	0.0216 nominal
Copper shingles[d]	0.0162 nominal
Exterior plywood (with sheathing)	0.313
Exterior plywood (without sheathing)	See Section 2304.6
Fiber cement lap siding	0.25[c]
Fiber cement panel siding	0.25[c]
Fiberboard siding	0.5
Glass-fiber reinforced concrete panels	0.375
Hardboard siding[c]	0.25
High-yield copper[d]	0.0162 nominal
Lead-coated copper[d]	0.0216 nominal
Lead-coated high-yield copper	0.0162 nominal
Marble slabs	1
Particleboard (with sheathing)	See Section 2304.6
Particleboard (without sheathing)	See Section 2304.6
Porcelain tile	0.25
Steel (approved corrosion resistant)	0.0149
Structural glass	0.344
Stucco or exterior cement plaster Three-coat work over: Metal plaster base Unit masonry Cast-in-place or precast concrete Two-coat work over: Unit masonry Cast-in-place or precast concrete	0.875[b] 0.625[b] 0.625[b] 0.5[b] 0.375[b]
Terra cotta (anchored)	1
Terra cotta (adhered)	0.25
Vinyl siding	0.035
Wood shingles	0.375
Wood siding (without sheathing)[a]	0.5

For SI: 1 inch = 25.4 mm, 1 ounce = 28.35 g, 1 square foot = 0.093 m^2.

a. Wood siding of thicknesses less than 0.5 inch shall be placed over sheathing that conforms to Section 2304.6.

b. Exclusive of texture.

c. As measured at the bottom of decorative grooves.

d. 16 ounces per square foot for cold-rolled copper and lead-coated copper, 12 ounces per square foot for copper shingles, high-yield copper and lead-coated high-yield copper.

Reason:

For several years efforts have been underway to standardize the minimum thickness requirements for adhered masonry veneers. While some adhered veneers are thicker than the 0.25 in. minimum for architectural, aesthetic, or manufacturing reasons, this change brings the requirements of Chapter 14 in line with industry practices.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

This change brings the requirements of Chapter 14 in line with current industry recommendations.

Internal ID: 2017

FS117-18

IBC: 1404.3, , 1404.3(1) (New), 1404.3(2) (New), TABLE 1404.3.2, 1404.3.2, 1404.3.3, 1404.3.4

Proponent: Jay Crandell, P.E., ARES Consulting, representing Foam Sheathing Committee of the American Chemistry Council

2018 International Building Code

Delete without substitution:

~~**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.~~

Revise as follows:

1404.3 Vapor retarders. Vapor retarder materials shall be classified in accordance with Table 1404.3(1). A vapor retarder shall be provided on the interior side of frame walls in accordance with Table 1404.3(2) and Table 1404.3(3), or an approved design using accepted engineering practice for hygrothermal analysis. The appropriate climate zone shall be selected in accordance with Chapter 3 of the International Energy Conservation Code.

~~**1404.3.1 Class I and II vapor retarders.** Class I and II vapor retarders shall not be provided on the interior side of frame walls in Zones 1 and 2. Class I vapor retarders shall not be provided on the interior side of frame walls in Zones 3 and 4 other than Marine 4. Class I or II vapor retarders shall be provided on the interior side of frame walls in Zones 5, 6, 7, 8 and Marine 4. The appropriate zone shall be selected in accordance with Chapter 3 [CE] of the International Energy Conservation Code-Commercial Provisions~~.

Exceptions:

1. Basement walls.
2. Below-grade portion of any wall.
3. Construction where ~~moisture~~ accumulation, condensation, or ~~its~~ freezing of moisture will not damage the materials.
4. ~~Conditions where Class III vapor retarders are required in Section 1404.3.2.~~

Add new text as follows:

1404.3(1)
VAPOR RETARDER MATERIALS AND CLASSES

VAPOR RETARDER CLASS	ACCEPTABLE MATERIALS
I	Sheet polyethylene, nonperforated aluminum foil, or other approved materials with a perm rating of less than or equal to 0.1
II	Kraft-faced fiberglass batts, paint, or other approved materials with a perm rating greater than 0.1 and less than or equal to 1.0
III	Latex paint, enamel paint, or other approved materials with a perm rating of greater than 1.0 and less than or equal to 10

TABLE 1404.3(2)
VAPOR RETARDER OPTIONS

CLIMATE ZONE	VAPOR RETARDER CLASS		
	I	II	III[a]
1, 2	Not permitted	Not Permitted	Permitted
3, 4 (except Marine 4)	Not permitted	Permitted	Permitted
Marine 4, 5, 6, 7, 8	Permitted	Permitted	See Table 1404.3(3)

a. Only Class III vapor retarders shall be used on the interior side of frame walls where foam plastic insulating sheathing with a perm rating of less than 1 is applied in accordance with Table 1404.3(3) on the exterior side of the frame wall.

Revise as follows:

TABLE ~~1404.3.2~~ 1404.3(3)
CLASS III VAPOR RETARDERS

ZONE	CLASS III VAPOR RETARDERS PERMITTED FOR:[a,b]
Marine 4	Vented cladding over wood structural panels Vented cladding over fiberboard Vented cladding over gypsum Continuous insulation with *R*-value ≥ R2.5 over 2 × 4 wallContinuous insulation with *R*-value ≥ R3.75 over 2 × 6 wall
5	Vented cladding over wood structural panels Vented cladding over fiberboard Vented cladding over gypsum Continuous insulation with *R*-value ≥ R5 over 2 × 4 wall Continuous insulation with *R*-value ≥ R7.5 over 2 × 6 wall
6	Vented cladding over fiberboard Vented cladding over gypsum Continuous insulation with *R*-value ≥ R7.5 over 2 × 4 wall Continuous insulation with *R*-value ≥ R11.25 over 2 × 6 wall
7 and 8	Continuous insulation with *R*-value ≥ R10 over 2 × 4 wall Continuous insulation with *R*-value ≥ R15 over 2 × 6 wall

~~For SI: 1 pound per cubic foot = 16 kg/m^3.~~

a. Spray foam with a maximum permanence of 1.5 perms at the installed thickness applied to the interior cavity side of wood structural panels, fiberboard, insulating sheathing or gypsum is deemed to meet the continuous insulation requirement where the spray foam *R*-value meets or exceeds the specified insulating sheathing *R*-value.

b. Vented cladding shall include vinyl lap siding, polypropylene, or horizontal aluminum siding, brick veneer with clear airspace as specified in this code, and other approved vented claddings.

Delete without substitution:

~~**1404.3.2 Class III vapor retarders.** Class III vapor retarders shall be permitted where any one of the conditions in Table 1404.3.2 is met. Only Class III vapor retarders shall be used on the interior side of frame walls where foam plastic insulating sheathing with a perm rating of less than 1 is applied in accordance with Table 1404.3.2 on the exterior side of the frame wall.~~

~~**1404.3.3 Material vapor retarder class.** The *vapor retarder class* shall be based on the manufacturer's certified testing or a tested assembly.~~
~~The following shall be deemed to meet the class specified:~~

~~Class I: Sheet polyethylene, nonperforated aluminum foil with a perm rating of less than or equal to 0.1.~~
~~Class II: Kraft-faced fiberglass batts or paint with a perm rating greater than 0.1 and less than or equal to 1.0.~~
~~Class III: Latex or enamel paint with a perm rating of greater than 1.0 and less than or equal to 10.0~~.

~~**1404.3.4 Minimum clear airspaces and vented openings for vented cladding.** For the purposes of this section, vented cladding shall include the following minimum clear airspaces:~~

1. ~~Vinyl, polypropylene or horizontal aluminum siding applied over a weather-resistive barrier as specified in this chapter.~~
2. ~~Brick veneer with a clear airspace as specified in this code.~~
3. ~~Other *approved* vented claddings.~~

Reason:
This proposal is a non-technical change to reformat the vapor retarder provisions to make them more transparent and user-friendly. The proposal uses a "look-up" table format whereby the logic for selection of appropriate vapor retarders is more visually obvious and appropriate options are more readily selected for various climate conditions and vapor retarder classes. This proposal is intended to help bring focus on consideration of formatting and editorial improvements while technical changes are addressed in separate proposals.

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

The proposal is a nontechnical format change and therefore has no cost impacts except those that might be associated with improving compliance and enforcement.

Internal ID: 1010

FS118-18

IBC: 1404.3, 1404.3.1

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

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.

Revise as follows:

1404.3.1 Class I and II vapor retarders. Class I and II vapor retarders shall not be provided on the interior side of frame walls in Zones 1 and 2. Class I vapor retarders shall not be provided on the interior side of frame walls in Zones 3 and 4 other than Marine 4. Class I or II vapor retarders shall be provided on the interior side of frame walls in Zones 5, 6, 7, 8 and Marine 4. The appropriate zone shall be selected in accordance with Chapter 3 [CE] of the International Energy Conservation Code-Commercial Provisions.

Exceptions:

1. Basement walls.
2. Below-grade portion of any wall.
3. Construction where moisture or its freezing will not damage the materials.
4. Class I and II vapor retarders with vapor permeability greater than 1 perm when measured by ASTM E96 water method (Procedure B) shall be allowed on the interior side of any frame wall in all climate zones.

~~4.~~5. Conditions where Class III vapor retarders are required in Section 1404.3.2.

Reason:

This proposal recognizes that some vapor retarders (both traditional and new materials) do not fit neatly into categories that are defined by Procedure A (dessicant method) vapor permeability measurements alone. The prohibition against the use of specific vapor retarder classes in specific climate zones is based on providing assemblies with the ability to dry to the interior. However, if a vapor retarder has vapor permeability that increases with relative humidity (RH) to a class III level, it has been shown that it allows drying. Therefore, these materials should not be prohibited. A list of references which demonstrate the improved drying using these types of materials is shown below.

Bibliography:

1. Mukhopadhyaya, P et. Al., "Accelerated Aging Performance Evaluation of "Smart Vapor Retarder"", Thermal Performance of the Exterior Envelopes of Whole Buildings International Conference XI, Clearwater, FL, December 2010

2. Gatland, Stanley D., "Vapor Retarders Play Crucial Role in Building Envelope Moisture Management Strategies", Interface, April 2010

3. Ueno, Kohta et al, "Field Monitoring of Wall Vapor Control Strategies in the Pacific Northwest", ACEEE Summer Study on Energy Efficiency in Buildings, 2008

4. Gatland Stanley D., II e.g. all, "The Hygrothermal Performance of Wood-Framed Wall Systems Using a Relative Humidity-Dependent Vapor Retarder in the Pacific Northwest", Thermal Performance of the Exterior Envelopes of Whole Buildings International Conference XI, Clearwater, FL, December 2007

5. Overton, G.E. (2016). Vapour Control in New Zealand Walls. Study Report SR344, BRANZ Ltd, Judgeford, New Zealand.

6. Kunzel, Hartwig M., "Flexible Vapor Control Solves Moisture Problems of Building Assemblies - Smart Retarder to Replace the Conventional PE-Film", J Thermal Envelope & Building Science, Vol. 23 (July 1999), pp 95 - 102.

7. Geving, Stig, PhD. et al, "Smart Vapour Barriers in Compact Wood Frame Roofs", Thermal Performance of the Exterior Envelopes of Whole Buildings International Conference XII Clearwater, FL, December 2013

8. Kunzel, Hartwig M., "More Moisture Load Tolerance of Construction Assemblies Through the Application of a Smart Vapor Retarder", Thermal Performance of the Exterior Envelopes of Whole Buildings International Conference VII, Clearwater, FL, December 1998

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

This proposal will not increase the cost of construction because it does not add any new requirements or restrictions. It provides additional options to meet the code.

Internal ID: 2045

FS119-18

IBC: 1404.3, 1404.3.1, 1404.3.2, 1404.3.3, TABLE 1404.3.3

Proponent: Kingston Chow, APA - The Engineered Wood Association, representing APA - The Engineered Wood Association (kingston.chow@apawood.org); Borjen Yeh, APA - The Engineered Wood Association, representing APA - The Engineered Wood Association (borjen.yeh@apawood.org)

2018 International Building Code

Revise as follows:

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

~~1404.3.3~~1404.3.1 Material vapor retarder class. The *vapor retarder class* shall be based on the manufacturer's certified testing or a tested assembly.
The following shall be deemed to meet the class specified:

Class I: Sheet polyethylene, nonperforated aluminum foil with a perm rating of less than or equal to 0.1.
Class II: Kraft-faced fiberglass batts or paint with a perm rating greater than 0.1 and less than or equal to 1.0.
Class III: Latex or enamel paint with a perm rating of greater than 1.0 and less than or equal to 10.0.

~~1404.3.1~~1404.3.2 Class I and II vapor retarders. Class I and II vapor retarders shall not be provided on the interior side of frame walls in Zones 1 and 2. Class I vapor retarders shall not be provided on the interior side of frame walls in Zones 3 and 4 other than Marine 4. Class I or II vapor retarders shall be provided on the interior side of frame walls in Zones 5, 6, 7, 8 and Marine 4. The appropriate zone shall be selected in accordance with Chapter 3 [CE] of the International Energy Conservation Code-Commercial Provisions.

Exceptions:

1. Basement walls.
2. Below-grade portion of any wall.
3. Construction where moisture or its freezing will not damage the materials.
4. Conditions where Class III vapor retarders are required in Section ~~1404.3.2.~~ 1404.3.3.

~~1404.3.2~~1404.3.3 Class III vapor retarders. Class III vapor retarders shall be permitted where any one of the conditions in Table ~~1404.3.2~~ 1404.3.3 is met. Only Class III vapor retarders shall be used on the interior side of frame walls where foam plastic insulating sheathing with a perm rating of less than 1 is applied in accordance with Table ~~1404.3.2~~ 1404.3.3 on the exterior side of the frame wall.

TABLE ~~1404.3.2~~1404.3.3
CLASS III VAPOR RETARDERS

ZONE	CLASS III VAPOR RETARDERS PERMITTED FOR:[a]
Marine 4	Vented cladding over wood structural panels Vented cladding over fiberboard Vented cladding over gypsum Continuous insulation with *R*-value ≥ R2.5 over 2 × 4 wallContinuous insulation with *R*-value ≥ R3.75 over 2 × 6 wall
5	Vented cladding over wood structural panels Vented cladding over fiberboard Vented cladding over gypsum Continuous insulation with *R*-value ≥ R5 over 2 × 4 wall Continuous insulation with *R*-value ≥ R7.5 over 2 × 6 wall
6	Vented cladding over fiberboard Vented cladding over gypsum Continuous insulation with *R*-value ≥ R7.5 over 2 × 4 wall Continuous insulation with *R*-value ≥ R11.25 over 2 × 6 wall
7 and 8	Continuous insulation with *R*-value ≥ R10 over 2 × 4 wall Continuous insulation with *R*-value ≥ R15 over 2 × 6 wall

For SI: 1 pound per cubic foot = 16 kg/m^3.

a. Spray foam with a maximum permanence of 1.5 perms at the installed thickness applied to the interior cavity side of wood structural panels, fiberboard, insulating sheathing or gypsum is deemed to meet the continuous insulation requirement where the spray foam *R*-value meets or exceeds the specified insulating sheathing *R*-value.

Reason:

This proposal is a non-technical change to reorder the original section 1404.3.3 Material vapor retarder class, which describes the three different vapor retarder classes before the original sections 1404.3.1 Class I and II vapor retarders and 1404.3.2 Class III vapor retarders. The proposal is intended to help bring clarity by introducing the three vapor retarder classes before outlining the restrictions in vapor retarder usage for the different climate zones as provided in the original sections 1404.3.1 and 1404.3.2.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

This change proposal is editorial with no technical change in content.

Internal ID: 1709

FS120-18

IBC: 1404.3.1, TABLE 1404.3.1 (New), 1404.3.2

Proponent: Jay Crandell, P.E., ARES Consulting, representing Foam Sheathing Committee of the American Chemistry Council (jcrandell@aresconsulting.biz); Vladimir Kochkin, representing Home Innovation Research Labs (vkochkin@homeinnovation.com)

2018 International Building Code

Revise as follows:

1404.3.1 Class I and II vapor retarders. Class I and II vapor retarders shall not be provided on the interior side of frame walls in Zones 1 and 2. Class I vapor retarders shall not be provided on the interior side of frame walls in Zones 3 and 4 other than Marine 4. Class I or II vapor retarders shall be provided on the interior side of frame walls in Zones 5, 6, 7, 8 and Marine 4. Where a Class II vapor retarder is used in combination with foam plastic insulating sheathing installed as continuous insulation on the exterior side of frame walls, the continuous insulation shall comply with Table 1404.3.1. Use of a Class I interior vapor retarder in frame walls with a Class I vapor retarder on the exterior side shall require an approved design. The appropriate zone shall be selected in accordance with Chapter 3 [CE] of the International Energy Conservation Code-Commercial Provisions.

Exceptions:

1. Basement walls.
2. Below-grade portion of any wall.
3. Construction where moisture or its freezing will not damage the materials.
4. Conditions where Class III vapor retarders are ~~required~~ permitted in Section 1404.3.2.

Add new text as follows:

TABLE 1404.3.1
CONTINUOUS INSULATION WITH CLASS II VAPOR RETARDER

CLIMATE ZONE	PERMITTED CONDITIONS[a]
3	Continuous insulation with R-value ≥2.
4, 5, and 6	Continuous insulation with R-value ≥ 3 over 2x4 wall. Continuous insulation with R-value ≥ 5 over 2x6 wall.
7	Continuous insulation with R-value ≥ 5 over 2x4 wall. Continuous insulation with R-value ≥ 7.5 over 2x6 wall.
8	Continuous insulation with R-value ≥ 7.5 over 2x4 wall. Continuous insulation with R-value ≥ 10 over 2x6 wall.

a. In addition to the vapor retarder, spray foam with a maximum permeance of 1.5 perms at the installed thickness, applied to the interior cavity side of wood structural panels, fiberboard, insulating sheathing or gypsum is deemed to comply with the continuous insulation requirement only for the moisture control purposes of this table where the spray foam R-value plus any continuous insulation R-value provided equals or exceeds the specified continuous insulation R-value.

Revise as follows:

1404.3.2 Class III vapor retarders. Class III vapor retarders shall be permitted where any one of the conditions in Table 1404.3.2 is met. ~~Only Class III vapor retarders shall be used on the interior side of frame walls where foam plastic insulating sheathing with a perm rating of less than 1 is applied in accordance with Table 1404.3.2 on the exterior side of the frame wall.~~

Reason:

As its primary objective, this proposal restores the ability to appropriately use a Class II interior vapor retarder where foam plastic insulating sheathing is used as continuous insulation on the exterior of buildings. This was permitted in earlier editions of the IBC, but not with appropriate requirements as now included in this proposal. This proposal has two practical benefits. First, it will better coordinate the requirements for vapor retarders with typical insulation requirements found in the International Energy Conservation Code for frame wall assemblies. Second, the proposed requirements in Table 1404.3.1 are identical to the format used in in existing Table 1404.3.2 for ease of use and compliance. They provide assurance that an adequate amount of continuous insulation is used together with a Class II interior vapor retarder to keep the interior of walls sufficiently warm (temperature moderated) to control the risk of condensation and moisture accumulation.

The continuous insulation requirements of proposed Table 1404.3.1 are based on more than 20-years of successful experience in the National Building Code of Canada as well as an extensive review of research, field data, analyses, and code requirements in the U.S. and Canada (ABTG, 2015; Crandell 2017); refer to the bibliography.

Use of a Class II interior vapor retarder with foam sheathing on the exterior has been shown to provide a very stable and dry wall assembly. In addition to the research and experience mentioned above, this has been more recently confirmed in a DOE and industry sponsored research project where various wall assemblies in 22 buildings across the colder climate zones of the U.S. were monitored for moisture performance (Shah and Kochkin, 2017). Regarding the use of Class II (e.g., Kraft paper) vapor retarders, the report found "very stable moisture content levels" and that their use "does not seem to alter the ability of walls with exterior foam sheathing to dry out." Consequently, the report recommends the "combination of exterior insulation and a Class II vapor retarder show promise as a technology for increased R-value with minimal changes in construction practices."

Finally, while there is adequate experience in the colder climates of the U.S. and Canada to justify use of a Class I interior vapor retarder (e.g., 4 mil poly) with foam plastic insulating sheathing on the exterior side of an assembly, this proposal requires an approved design for the case of a double vapor barrier assembly (e.g., materials classified as a Class I vapor retarder are used on both sides of the assembly). The National Building Code of Canada does permit the use of a Class I interior vapor retarder with low-perm foam plastic exterior insulation and requires provisions similar to those provided in proposed Table 1404.3.1. Furthermore, the study mentioned above also demonstrates that use of a Class I interior vapor retarder on walls with or without exterior insulation "show stable low moisture content levels" (Shah and Kochkin, 2017). But, due to concerns with low drying potential, it is generally cautioned that walls using a double vapor barrier (Class I vapor retarder on both sides) be "accompanied with air sealing details and drainage plane details to avoid or minimize the potential for water leaks or moisture accumulation" (Shah and Kochkin, 2017). Thus, while known to work favorably in appropriate conditions of use, the use of a double vapor barrier assembly may require some additional considerations to ensure performance and this should be a matter of design as required in this proposal.

Bibliography:

Assessment of Water Vapor Control Methods for Modern Insulated Light-Frame Wall Assemblies, ABTG Research Report No. 1410-03, 2015, Applied Building Technology Group LLC, https://www.appliedbuildingtech.com/rr/1410-03

Assessment of Hygrothermal Performance and Design Guidance for Modern Light-Frame Wall Assemblies, ASTM STP 1599, Crandell, J.H., 2017, https://www.astm.org/DIGITAL_LIBRARY/STP/PAGES/STP159920160097.htm

Moisture Performance of High-R Wall Systems, Prepared for US DOE & NAHB by Home Innovation Research Labs, Kochkin, V. and Shah, N., 2017 (pending publication)

Cost Impact

The code change proposal will decrease the cost of construction .

Including the option to use a Class II vapor retarder with foam plastic insulating sheathing (or a Class I vapor retarder

with an approved design) will decrease cost and better enable cost-effective compliance with energy code requirements while maintaining good moisture performance.

Internal ID: 1014

FS121-18

IBC: 1404.3.1, 1404.3.2

Proponent: Mike Fischer, Kellen Company, representing The Polyisocyanurate Insulation Manufacturers Association (mfischer@kellencompany.com)

2018 International Building Code

Revise as follows:

1404.3.1 Class I and II vapor retarders. Class I and II vapor retarders shall not be provided on the interior side of frame walls in Zones 1 and 2. Class I vapor retarders shall not be provided on the interior side of frame walls in Zones 3 and 4 other than Marine 4. Class I or II vapor retarders shall be provided on the interior side of frame walls in Zones 5, 6, 7, 8 and Marine 4. The appropriate zone shall be selected in accordance with Chapter 3 [CE] of the International Energy Conservation Code-Commercial Provisions.

Exceptions:

1. Basement walls.
2. Below-grade portion of any wall.
3. Construction where moisture or its freezing will not damage the materials.
4. ~~Conditions where Class III vapor retarders are required in Section 1404.3.2.~~

1404.3.2 Class III vapor retarders. Class III vapor retarders shall be permitted ~~where~~ for any one of the conditions in Table 1404.3.2 ~~is met. Only Class III vapor retarders shall be used~~ on the ~~interior side of frame walls where foam plastic insulating sheathing with a perm rating of less than 1 is applied in accordance with Table 1404.3.2 on the~~ exterior side of ~~the~~ frame ~~wall.~~walls.

Reason:

The clauses proposed for deletion were originally added to the code as an interim conservative measure while appropriate use of Class I and II vapor retarders on walls with foam plastic insulating sheathing were more thoroughly investigated. Now, an extensive review of data, analyses, and experience has been completed (refer to bibliography). The findings indicate that the concern with appropriate use of Class I and II vapor retarders concern is mainly a concern for walls without temperature moderation as provided by continuous insulation. Field data and analyses from several studies have demonstrated successful use of Class I and II vapor retarders on walls with exterior foam sheathing used as continuous insulation. As further confirmation, this method has been successfully used in Canada and explicitly recognized in the National Building Code of Canada since the 1995 edition. In addition, this proposal will make the IBC provisions consistent with the IRC provisions which were not changed to require use of only Class III vapor retarders with foam sheathing. Thus, this proposal will restore consistency between the IBC and IRC. It also simplifies the code.

Bibliography:

Assessment of Hygrothermal Performance and Design Guidance for Modern Light-Frame Wall Assemblies, ASTM STP1599, J. H. Crandell, 2017, pp.362-394, https://www.astm.org/DIGITAL_LIBRARY/STP/PAGES/STP159920160097.htm

Assessment of Water Vapor Control Methods for Modern Insulated Light-Frame Wall Assemblies, ABTG Research Report No. 1410-03, Applied Building Technology Group LLC, 2015, https://www.appliedbuildingtech.com/rr/1410-03

Cost Impact

The code change proposal will decrease the cost of construction .

This proposal will allow (actually restore) vapor retarder options that provide at least equivalent performance for water vapor control at a lower cost than would occur where Class III vapor retarders are currently required to be used.

Internal ID: 1013

FS122-18

IBC: 1404.3.2, 1404.3.2.1 (New), 1404.3.2.2 (New), 1404.3.2.2.1 (New), TABLE 1404.3.2

Proponent: Mike Fischer, Kellen Company, representing The Center for the Polyurethanes Industry of the American Chemistry Council (mfischer@kellencompany.com)

2018 International Building Code

Revise as follows:

1404.3.2 Class III vapor retarders. Class III vapor retarders shall be permitted where any one of the conditions in Table 1404.3.2 is met. ~~Only Class III vapor retarders shall be used on the interior side of frame walls where foam plastic insulating sheathing with a perm rating of less than 1 is applied in accordance with Table 1404.3.2 on the exterior side of the frame wall.~~

Add new text as follows:

1404.3.2.1 Foam plastic insulating sheathing for moisture control with Class III vapor retarders. . Where foam plastic insulating sheathing with a perm rating of less than 1 is installed in accordance with Table 1404.3.2 on the exterior side of the frame wall, only Class III vapor retarders shall be used on the interior side of the frame wall.

1404.3.2.2 Spray foam plastic insulation for moisture control with Class III vapor retarders. . For purposes of compliance with Table 1404.3.2, spray foam with a maximum permeance of 1.5 perms at the installed thickness applied to the interior cavity side of wood structural panels, fiberboard, insulating sheathing or gypsum shall be deemed to meet the continuous insulation R-value requirement where the spray foam R-value meets or exceeds the specified continuous insulation R-value.

1404.3.2.2.1 Hybrid insulation for moisture control with Class IIII vapor retarders. . For the purposes of compliance with Table 1404.3.2, the combined R-values of spray foam plastic insulation and continuous insulation shall be permitted to be counted towards the continuous R-value requirement.

Revise as follows:

TABLE 1404.3.2
CLASS III VAPOR RETARDERS

ZONE	CLASS III VAPOR RETARDERS PERMITTED FOR:[a]
Marine 4	Vented cladding over wood structural panels Vented cladding over fiberboard Vented cladding over gypsum Continuous insulation with *R*-value ≥ R2.5 over 2 × 4 wallContinuous insulation with *R*-value ≥ R3.75 over 2 × 6 wall
5	Vented cladding over wood structural panels Vented cladding over fiberboard Vented cladding over gypsum Continuous insulation with *R*-value ≥ R5 over 2 × 4 wall Continuous insulation with *R*-value ≥ R7.5 over 2 × 6 wall
6	Vented cladding over fiberboard Vented cladding over gypsum Continuous insulation with *R*-value ≥ R7.5 over 2 × 4 wall Continuous insulation with *R*-value ≥ R11.25 over 2 × 6 wall
7 and 8	Continuous insulation with *R*-value ≥ R10 over 2 × 4 wall Continuous insulation with *R*-value ≥ R15 over 2 × 6 wall

For SI:1 pound per cubic foot = 16 kg/m^3.

~~a.Spray foam with a maximum permanence of 1.5 perms at the installed thickness applied to the interior cavity side of wood structural panels, fiberboard, insulating sheathing or gypsum is deemed to meet the continuous insulation requirement where the spray foam *R*-value meets or exceeds the specified insulating sheathing *R*-value.~~

Reason:

The current Table 1404.3.2 mandates continuous insulation for moisture control but provides an exception for spray foam in the cavity. The table does not currently permit a combination of continuous and cavity; this is inconsistent with the intent of the cavity option. Additionally, with prescriptive options in the IECC including hybrid insulation systems with a combination of cavity and continuous, this will help correlate the IBC and IECC requirements.The proposal adds charging language that clarifies how the combination of different insulating methods can provide appropriate moisture control so that the total required R-Value can be achieved by continuous, cavity, or a combination of insulation strategies.

Cost Impact

The code change proposal will decrease the cost of construction .

By adding options for insulation used to control moisture and condensation, the proposal increases flexibility which will include lower cost options.

Internal ID: 2387

FS123-18

IBC: 1404.3.2

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

2018 International Building Code

Revise as follows:

1404.3.2 Class III vapor retarders. Class III vapor retarders shall be permitted in Climate Zones 1 through 3 and where any one of the conditions in Table 1404.3.2 is met. Only Class III vapor retarders shall be used on the interior side of frame walls where foam plastic insulating sheathing with a perm rating of less than 1 is applied in accordance with Table 1404.3.2 on the exterior side of the frame wall.

Reason:

Class III vapor retarders should should be permitted for use in Climate Zones 1 through 3. Currently, the code is unclear or implies they may not be permitted. In these warmer climates, the conditions of Table 1404.3.2 are not necessary. Therefore, the inclusion of Climate Zones 1-3 is provided in the text of Section 1404.3.2. This change will also make it clear that it is OK to use latex paints (many of which could be classified as a Class III vapor retarder) as interior finishes in these climate zones, even if not declared to be a vapor retarder.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

This is a clarification of the code with no cost impact.

Internal ID: 2342

FS124-18

IBC: 1404.3.2

Proponent: Kingston Chow, APA - The Engineered Wood Association, representing APA - The Engineered Wood Association (kingston.chow@apawood.org); Borjen Yeh, APA - The Engineered Wood Association, representing APA - The Engineered Wood Association (borjen.yeh@apawood.org)

2018 International Building Code

1404.3.2 Class III vapor retarders. Class III vapor retarders shall be permitted where any one of the conditions in Table 1404.3.2 is met. Only Class III vapor retarders shall be used on the interior side of frame walls where ~~foam plastic insulating sheathing~~ continuous insulation with a perm rating of less than 1 is applied in accordance with Table 1404.3.2 on the exterior side of the frame wall.

Reason:

This proposed change ensures language is consistent with Table 1404.3.2 (i.e., continuous insulation) and applies to other types of continuous insulation with a perm rating of less than 1 other than foam plastic insulating sheathing.

The reason the IBC requires an interior Class III vapor retarder in conjunction with low perm exterior foam plastic sheathing is to ensure at least one path for walls to dry when they get wet. While exterior continuous insulation helps to minimize one source of moisture accumulation in wall assemblies (condensation), wetting due to improper flashing and detailing, leaky windows, wind driven rain, etc. necessitates that drying of wall assemblies can take place. Therefore, the current requirement for ensuring drying to the interior should apply to any exterior continuous insulation with a perm rating less than 1.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

This change proposal simply clarifies the terminology used in the provision.

Internal ID: 1693

FS125-18

IBC: TABLE 1404.3.2, 1404.3.2

Proponent: Jay Crandell, P.E., ARES Consulting, representing Foam Sheathing Committee of the American Chemistry Council

2018 International Building Code

Revise as follows:

TABLE 1404.3.2
CLASS III VAPOR RETARDERS

ZONE	CLASS III VAPOR RETARDERS PERMITTED FOR:[a]
~~Marine~~ 4	Vented cladding over wood structural panels Vented cladding over fiberboard Vented cladding over gypsum Continuous insulation with *R*-value ≥ R2.5 over 2 × 4 wallContinuous insulation with *R*-value ≥ R3.75 over 2 × 6 wall
5	Vented cladding over wood structural panels Vented cladding over fiberboard Vented cladding over gypsum Continuous insulation with *R*-value ≥ R5 over 2 × 4 wall Continuous insulation with *R*-value ≥ R7.5 over 2 × 6 wall
6	Vented cladding over fiberboard Vented cladding over gypsum Continuous insulation with *R*-value ≥ R7.5 over 2 × 4 wall Continuous insulation with *R*-value ≥ R11.25 over 2 × 6 wall
7 and 8	Continuous insulation with *R*-value ≥ R10 over 2 × 4 wall Continuous insulation with *R*-value ≥ R15 over 2 × 6 wall

For SI: 1 pound per cubic foot = 16 kg/m^3.

a. Spray foam with a maximum permanence of 1.5 perms at the installed thickness applied to the interior cavity side of wood structural panels, fiberboard, insulating sheathing or gypsum is deemed to meet the continuous insulation requirement where the spray foam *R*-value meets or exceeds the specified insulating sheathing *R*-value.

1404.3.2 Class III vapor retarders. Class III vapor retarders shall be permitted in Climate Zones 1 through 3 and where any one of the conditions in Table 1404.3.2 is met. Only Class III vapor retarders shall be used on the interior side of frame walls where foam plastic insulating sheathing with a perm rating of less than 1 is applied in accordance with Table 1404.3.2 on the exterior side of the frame wall.

Reason:

Section 1404.3.2 is revised to recognize that Class III vapor retarders also are permitted in Climate Zones 1-3 without having to comply with the conditions in Table 1404.3.2 intended for colder climate applications. This clarifies the code as intended and resolves an interpretation problem where it is unclear that Class III vapor retarders are OK to use in Climate Zones 1-3. In fact, latex paint often complies with a Class III vapor retarder and is commonly used in all climate zones for interior finish, even if not declared to be a Class III vapor retarder.

Table 1404.3.2 is revised so that the requirements for Climate Zone "Marine 4" are applied to all of Climate Zone 4. The Marine 4 climate zone is actually a warmer-in-winter climate zone than the remainder of Climate Zone 4. Thus, if conditions are necessary to control water vapor in Marine 4 it should also be required in all of Climate Zone 4 and especially in the "moist" (A) regions of Climate Zone 4. This need has been confirmed by experience, field data, testing and analysis in recent years. Refer to the bibliography for additional information and substantiation.

Bibliography:

Assessment of Hygrothermal Performance and Design Guidance for Modern Light-Frame Wall Assemblies, ASTM STP1599, J. H. Crandell, 2017, pp.362-394, https://www.astm.org/DIGITAL_LIBRARY/STP/PAGES/STP159920160097.htm

Assessment of Water Vapor Control Methods for Modern Insulated Light-Frame Wall Assemblies, ABTG Research Report No. 1410-03, Applied Building Technology Group LLC, 2015, https://www.appliedbuildingtech.com/rr/1410-03

Cost Impact

The code change proposal will increase the cost of construction .

While this proposal will potentially increase cost of using a Class III vapor retarder in much of Climate Zone 4 (not Marine 4), one interpretation is that this proposal actually adds the option of using a Class III vapor retarder in all of Climate Zone 4 and also in Climate Zones 1-3. In the latter case, the proposal may actually reduce costs by allowing interior latex paint to be used as the vapor retarder. From a moisture durability and risk standpoint, this proposal also should reduce associated costs after construction.

Internal ID: 1009

FS126-18

IBC: TABLE 1404.3.2

Proponent: Craig Conner, representing self (craig.conner@mac.com); Joseph Lstiburek, representing Self (joe@buildingscience.com)

2018 International Building Code

Revise as follows:

TABLE 1404.3.2
CLASS III VAPOR RETARDERS

ZONE	CLASS III VAPOR RETARDERS PERMITTED FOR:[a]
~~Marine~~ 4	Vented cladding over wood structural panels Vented cladding over fiberboard Vented cladding over gypsum Continuous insulation with *R*-value ≥ R2.5 over 2 × 4 wallContinuous insulation with *R*-value ≥ R3.75 over 2 × 6 wall
5	Vented cladding over wood structural panels Vented cladding over fiberboard Vented cladding over gypsum Continuous insulation with *R*-value ≥ R5 over 2 × 4 wall Continuous insulation with *R*-value ≥ R7.5 over 2 × 6 wall
6	Vented cladding over fiberboard Vented cladding over gypsum Continuous insulation with *R*-value ≥ R7.5 over 2 × 4 wall Continuous insulation with *R*-value ≥ R11.25 over 2 × 6 wall
7 and 8	Continuous insulation with *R*-value ≥ R10 over 2 × 4 wall Continuous insulation with *R*-value ≥ R15 over 2 × 6 wall

For SI: 1 pound per cubic foot = 16 kg/m^3.

a. Spray foam with a maximum permanence of 1.5 perms at the installed thickness applied to the interior cavity side of wood structural panels, fiberboard, insulating sheathing or gypsum is deemed to meet the continuous insulation requirement where the spray foam *R*-value meets or exceeds the specified insulating sheathing *R*-value.

Reason:

When Table 1405.3.2 was first added to the IBC (and IRC Table R702.7), only Climate Zone 4 Marine was addressed and not all of Climate Zone 4. Subsequent experience, field data, testing and analysis has demonstrated that these requirements should apply to all of Climate Zone 4, not just Climate Zone 4 Marine.

Cost Impact

The code change proposal will decrease the cost of construction .

This gives another option to zones 4A and 4B. Sometimes the option will be less expensive.

Internal ID: 1984

FS127-18

IBC: TABLE 1404.3.2

Proponent: Jay Crandell, P.E., ARES Consulting, representing Foam Sheathing Committee of the American Chemistry Council

2018 International Building Code

Revise as follows:

TABLE 1404.3.2
CLASS III VAPOR RETARDERS

ZONE	CLASS III VAPOR RETARDERS PERMITTED FOR:[a]
Marine 4	Vented cladding over wood structural panels Vented cladding over fiberboard Vented cladding over gypsum Continuous insulation with *R*-value ≥ R2.5 over 2 × 4 wallContinuous insulation with *R*-value ≥ R3.75 over 2 × 6 wall
5	Vented cladding over wood structural panels Vented cladding over fiberboard Vented cladding over gypsum Continuous insulation with *R*-value ≥ R5 over 2 × 4 wall Continuous insulation with *R*-value ≥ R7.5 over 2 × 6 wall
6	Vented cladding over fiberboard Vented cladding over gypsum Continuous insulation with *R*-value ≥ R7.5 over 2 × 4 wall Continuous insulation with *R*-value ≥ R11.25 over 2 × 6 wall
7 ~~and 8~~	Continuous insulation with *R*-value ≥ R10 over 2 × 4 wall Continuous insulation with *R*-value ≥ R15 over 2 × 6 wall
8	Continuous insulation with R-value ≥ 12.5 over 2x4 wall. Continuous insulation with R-value >= 20 over 2x6 wall

For SI: 1 pound per cubic foot = 16 kg/m^3.

a. Spray foam with a maximum permanence of 1.5 perms at the installed thickness applied to the interior cavity side of wood structural panels, fiberboard, insulating sheathing or gypsum is deemed to meet the continuous insulation requirement where the spray foam *R*-value meets or exceeds the specified insulating sheathing *R*-value.

Reason:

This proposal corrects and inadvertent error when Table 1404.3.2 was first included in the code. Climate Zone 8 was not intended to be included with Climate Zone 7. Climate Zone 8 is a colder climate and requires additional continuous insulation to maintain proper moisture control and equivalent performance. The proposed R-values for Climate Zone 8 are consistent with the experience and technical basis for provisions in the other climate zones addressed in Table 1404.3.2. Refer to the bibliography for additional information and substantiation.

Bibliography:

Assessment of Hygrothermal Performance and Design Guidance for Modern Light-Frame Wall Assemblies, ASTM STP1599, J. H. Crandell, 2017, pp.362-394, https://www.astm.org/DIGITAL_LIBRARY/STP/PAGES/STP159920160097.htm

Assessment of Water Vapor Control Methods for Modern Insulated Light-Frame Wall Assemblies, ABTG Research Report No. 1410-03, Applied Building Technology Group LLC, 2015, https://www.appliedbuildingtech.com/rr/1410-03

Cost Impact

The code change proposal will increase the cost of construction .

This proposed technical correction of the code will increase the cost of construction only where using a Class III vapor retarder (e.g. latex paint) in Climate Zone 8. However, other vapor retarder options and wall assembly options are unchanged so, technically, this should not increase the cost of construction where these other options are used.

Internal ID: 999

FS128-18

IBC: TABLE 1404.3.2

Proponent: Craig Conner, representing self (craig.conner@mac.com); Joseph Lstiburek, representing Self (joe@buildingscience.com)

2018 International Building Code

Revise as follows:

TABLE 1404.3.2
CLASS III VAPOR RETARDERS

ZONE	CLASS III VAPOR RETARDERS PERMITTED FOR:[a]
Marine 4	Vented cladding over wood structural panels Vented cladding over fiberboard Vented cladding over gypsum Continuous insulation with *R*-value ≥ R2.5 over 2 × 4 wallContinuous insulation with *R*-value ≥ R3.75 over 2 × 6 wall
5	Vented cladding over wood structural panels Vented cladding over fiberboard Vented cladding over gypsum Continuous insulation with *R*-value ≥ R5 over 2 × 4 wall Continuous insulation with *R*-value ≥ R7.5 over 2 × 6 wall
6	Vented cladding over fiberboard Vented cladding over gypsum Continuous insulation with R-value ≥ R7.5 over 2 × 4 wall Continuous insulation with R-value ≥ R11.25 over 2 × 6 wall
7 ~~and 8~~	Continuous insulation with R-value ≥ R10 over 2 × 4 wall Continuous insulation with R-value ≥ R15 over 2 × 6 wall
8	Continuous insulation with R-value ≥ R12.5 over 2 × 4 wall Continuous insulation with R-value ≥ R20 over 2 × 6 wall

For SI: 1 pound per cubic foot = 16 kg/m^3.

a. Spray foam with a maximum permanence of 1.5 perms at the installed thickness applied to the interior cavity side of wood structural panels, fiberboard, insulating sheathing or gypsum is deemed to meet the continuous insulation requirement where the spray foam *R*-value meets or exceeds the specified insulating sheathing *R*-value.

Reason:

When Table 1404.3.2 was first added to the IBC (and IRC Table R702.7) Climate Zone 8 was inadvertently included with Climate Zone 7. This corrects that error. The technical justification for this can be found at the following link (specifically Table 2):

https://buildingscience.com/documents/building-science-insights/bsi-100-hybrid-assemblies as available January 10th, 2018

Cost Impact

The code change proposal will increase the cost of construction .

This change increases the insulation level, which in principal would cost more. However, the table has the incorrect value.

Internal ID: 1972

FS129-18

IBC: TABLE 1404.3.2

Proponent: Mike Fischer, Kellen Company, representing The Center for the Polyurethanes Industry of the American Chemistry Council (mfischer@kellencompany.com)

2018 International Building Code

Revise as follows:

TABLE 1404.3.2
CLASS III VAPOR RETARDERS

ZONE	CLASS III VAPOR RETARDERS PERMITTED FOR:[a]
Marine 4	Vented cladding over wood structural panels Vented cladding over fiberboard Vented cladding over gypsum Continuous insulation with *R*-value ≥ R2.5 over 2 × 4 wallContinuous insulation with *R*-value ≥ R3.75 over 2 × 6 wall
5	Vented cladding over wood structural panels Vented cladding over fiberboard Vented cladding over gypsum Continuous insulation with *R*-value ≥ R5 over 2 × 4 wall Continuous insulation with *R*-value ≥ R7.5 over 2 × 6 wall
6	Vented cladding over fiberboard Vented cladding over gypsum Continuous insulation with *R*-value ≥ R7.5 over 2 × 4 wall Continuous insulation with *R*-value ≥ R11.25 over 2 × 6 wall
7 and 8	Continuous insulation with *R*-value ≥ R10 over 2 × 4 wall Continuous insulation with *R*-value ≥ R15 over 2 × 6 wall

For SI: 1 pound per cubic foot = 16 kg/m^3.

a. Compliance with the R-value requirement may be met by continuous insulation, spray foam, or a combination of continuous insulation and spray foam. Spray foam ~~with~~ shall have a maximum permanence of 1.5 perms at the installed thickness and shall be applied to the interior cavity side of wood structural panels, fiberboard, insulating sheathing or ~~gypsum is deemed to meet the continuous insulation requirement where the spray foam *R*-value meets or exceeds the specified insulating sheathing *R*-value.~~gypsum.

b. For the purposes of compliance with Table 1404.3.2, the combined R-values of spray foam plastic insulation and continuous insulation shall be permitted to be counted towards the continuous R-value requirement.

Reason:

The current Table 1404.3.2 mandates continuous insulation for moisture control but provides an exception for spray foam in the cavity. The table does not currently permit a combination of continuous and cavity; this is inconsistent with the intent of the cavity option. Additionally, with prescriptive options in the IECC including hybrid insulation systems with a combination of cavity and continuous, this will help correlate the IBC and IECC requirements. The proposal simply modifies the table so that the total R-Value can be achieved by continuous, cavity, or a combination of insulation strategies.

Cost Impact

The code change proposal will decrease the cost of construction .

The proposal increases options for insulation used as condensation control by adding an option for a hybrid system. It adds no mandatory requirements.

Internal ID: 2382

FS130-18

IBC: TABLE 1404.3.2

Proponent: Mike Fischer, Kellen Company, representing The Center for the Polyurethanes Industry of the American Chemistry Council (mfischer@kellencompany.com)

2018 International Building Code

Revise as follows:

TABLE 1404.3.2
CLASS III VAPOR RETARDERS

ZONE	CLASS III VAPOR RETARDERS PERMITTED FOR:[a,b]
Marine 4	Vented cladding over wood structural panels Vented cladding over fiberboard Vented cladding over gypsum Continuous insulation with *R*-value ≥ R2.5 over 2 × 4 wallContinuous insulation with *R*-value ≥ R3.75 over 2 × 6 wall
5	Vented cladding over wood structural panels Vented cladding over fiberboard Vented cladding over gypsum Continuous insulation with *R*-value ≥ R5 over 2 × 4 wall Continuous insulation with *R*-value ≥ R7.5 over 2 × 6 wall
6	Vented cladding over fiberboard Vented cladding over gypsum Continuous insulation with *R*-value ≥ R7.5 over 2 × 4 wall Continuous insulation with *R*-value ≥ R11.25 over 2 × 6 wall
7 and 8	Continuous insulation with *R*-value ≥ R10 over 2 × 4 wall Continuous insulation with *R*-value ≥ R15 over 2 × 6 wall

For SI: 1 pound per cubic foot = 16 kg/m^3.

a.Spray foam with a maximum permanence of 1.5 perms at the installed thickness applied to the interior cavity side of wood structural panels, fiberboard, insulating sheathing or gypsum is deemed to meet the continuous insulation moisture control requirement where the spray foam *R*-value meets or exceeds the specified insulating sheathing *R*-value.

b. The requirements in this table apply only to insulation used to control moisture in order to permit the use of Class III vapor retarders. The insulation materials used to satisfy this option also contribute to but do not supersede the thermal envelope requirements of the International Energy Conservation Code.

Reason:

The proposal clarifies that spray foam used to satisfy the continuous insulation requirements are intended to be used for moisture control. It adds an additional footnote to the table to clarify that the provisions of the IECC are not supplanted by this option.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

The proposal is editorial.

Internal ID: 1951

FS131-18

IBC: 1404.3.3

Proponent: John Woestman, Kellen Co., representing Extruded Polystyrene Foam Association (XPSA) (jwoestman@kellencompany.com)

2018 International Building Code

Revise as follows:

1404.3.3 Material vapor retarder class. The *vapor retarder class* shall be based on the manufacturer's certified testing or a tested assembly.
The following shall be deemed to meet the class specified:

Class I: Sheet polyethylene, nonperforated aluminum foil with a perm rating of less than or equal to 0.1.

Class II: Kraft-faced fiberglass batts or vapor retarder paint applied in accordance with the manufacturer's instructions for a perm rating greater than 0.1 and less than or equal to 1.0.

Class III: Latex or enamel paint applied in accordance with the manufacturer's instructions for a perm rating of greater than 1.0 and less than or equal to 10.0.

Reason:
This proposal clarifies that where paints are used as vapor retarders they must be applied in accordance with the manufacturer's instructions to achieve the required perm rating for the vapor retarder class. Misuse or misapplication of paints that also may not be specifically recommended for use as vapor retarders has been shown to increase the risk of moisture problems in walls with Class III vapor retarders. Cases have been documented where paint applications have a water vapor permeance of more than three times greater than the maximum limit for Class III vapor retarders. As a result, walls intended to rely on Class III vapor retarders can experience an increased risk of moisture accumulation problems. This proposal will provide the ability to avoid this problem.

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

This proposal clarifies the intent of the code and does not impact cost.

Internal ID: 1012

FS132-18

IBC: 1404.3.4

Proponent: Charles Clark Jr, Brick Industry Association, representing Brick Industry Association, representing the Masonry Alliance for Codes and Standards (cclark@bia.org)

2018 International Building Code

Revise as follows:

1404.3.4 Minimum ~~clear~~ airspaces and vented openings for vented cladding. For the purposes of this section, vented cladding shall include the following minimum clear airspaces:

1. Vinyl, polypropylene or horizontal aluminum siding applied over a weather-resistive barrier as specified in this chapter.
2. Brick veneer with ~~a clear~~ an airspace as specified in this code.
3. Other *approved* vented claddings.

Reason:

Although the use of the term "clear" in this text appears intended to refer to an airspace sufficiently unrestricted to permit air and water movement, this same term has been interpreted, in many cases, to mean that the presence of any mortar whatsoever within the airspace of a brick veneer cladding results in a non-code compliant condition for the entire brick veneer. Mortar fins and mortar droppings are an inherent part of masonry construction. It has been demonstrated that no matter how experienced the mason or how carefully the masonry is constructed, the brick veneer airspace will never be completely devoid of mortar.

However, empirical evidence has overwhelmingly confirmed that acceptable drainage performance exists even when the airspace contains mortar fins and mortar droppings. Removing the term "clear" from the IBC text allows respective material codes and standards to define the airspace condition in a manner appropriate to the cladding material.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

This proposed code change serves to clarify existing language and will not change the cost of construction, as it allows existing construction methods to be maintained.

Internal ID: 1598

FS133-18

IBC: 1404.4

Proponent: Mike Fischer, Kellen Company, representing The Polyisocyanurate Insulation Manufacturers Association (mfischer@kellencompany.com)

2018 International Building Code

Revise as follows:

1404.4 Flashing. Flashing shall be installed in such a manner so as to prevent moisture from entering the wall or to redirect that moisture to the ~~exterior.~~ surface of the exterior wall finish or to a water-resistive barrier complying with Section 1403.2 and that is part of a means of drainage complying with Section 1402.2. Flashing shall be installed at the perimeters of exterior door and window assemblies, penetrations and terminations of *exterior wall* assemblies, *exterior wall* intersections with roofs, chimneys, porches, decks, balconies and similar projections and at built-in gutters and similar locations where moisture could enter the wall. Flashing with projecting flanges shall be installed on both sides and the ends of copings, under sills and continuously above projecting *trim*. Where self-adhered membranes are used as flashings of *fenestration* in wall assemblies, those self-adhered flashings shall comply with AAMA 711. Where fluid applied membranes are used as flashing for *exterior wall* openings, those fluid applied membrane flashings shall comply with AAMA 714.

Reason:

This proposal provides language to coordinate with similar language in the 2018 IRC Section R703.4 which appropriately recognizes that some flashing applications necessarily direct water to the water-resistive barrier surface where it is subsequently drained at flashing or weeps extending through the exterior wall covering.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

This proposal is a clarification of the code and has no cost impact.

Internal ID: 992

FS134-18

IBC: 1405.1.1

Proponent: Ronald Nickson, Nickson Code Consulting, representing Rockwool (nicksoncodeconsulting@gmail.com)

2018 International Building Code

Revise as follows:

1405.1.1 Types I, II, III, IV and ~~IV~~ V construction. On buildings of Types I, II, III, IV and ~~IV~~ V construction, *exterior wall coverings* shall be permitted to be constructed of combustible materials, complying with the following limitations:

1. Combustible *exterior wall coverings* shall not exceed 10 percent of an *exterior wall* surface area where the fire separation distance is 5 feet (1524 mm) or less.
2. Combustible *exterior wall coverings* shall be limited to 40 feet (12 192 mm) in height above grade plane.
3. Combustible *exterior wall coverings* constructed of fire-retardant-treated wood complying with Section 2303.2 for exterior installation shall not be limited in wall surface area where the fire separation distance is 5 feet (1524 mm) or less and shall be permitted up to 60 feet (18 288 mm) in height above grade plane regardless of the fire separation distance.
4. Wood veneers shall comply with Section 1404.5.

   Exception: Combustible exterior wall covering in Type V construction is not limited to 10 percent of the exterior wall surface.

Reason:

This proposal adds Type V construction to Section1405 Combustible Materials on The Exterior Side of Exterior Walls, to be included for what is already required for Types, I, II, III and IV construction. This is a companion change to a proposed new Section 1406.2 proposing to incorporate into the code fire test procedures to determine the impact different materials will have on the spread of a fire on the exterior wall and spreading into the attic. This change addresses ignitability based on the distance from the property line. Proposal 1402.6 address the methodology to determine if the fire will reach the attic.

Energy code requirements have prompted the construction industry to include combustible exterior continuous insulation that can be easily ignited by reflection from glazing or fires in adjacent buildings. Fire separation distance requirements are predicated on historical construction materials and have been deemed to provide a sufficient distance from property lines based on the radiation thresholds provided in Table 1405.1.1.1.2. Type V buildings have not needed exterior wall fire related restrictions because product combinations such as vinyl siding over OSB have been sufficiently fire-safe. The introduction of combustible materials over the OSB board as a result of energy code requirements without any fire testing requirements presents a high risk for ignition when exposed to fires from neighbouring buildings or other burning objects.

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 increase 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 to flame spread was exterior sidewall covering and surface finish. This type of fire has increased dramatically in in recent years causing an annual average of 50 casualties, 345 injuries and $539 million in property damage.

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. Material and installation cost are basically natural.

Internal ID: 1791

FS135-18

IBC: 1405.1.1

Proponent: William Hall, Portland Cement.Association, representing Alliance For Concrete Codes and Standards (jhall@cement.org); Jason Thompson, National Concrete Masonry Association, representing Masonry Alliance for Codes and Standards (jthompson@ncma.org)

2018 International Building Code

Revise as follows:

1405.1.1 Types I, II, III and IV construction. On buildings of Types I, II, III and IV construction, *exterior wall coverings* shall be permitted to be constructed of combustible materials, complying with the following limitations:

1. Combustible *exterior wall coverings* shall not exceed 10 percent of an *exterior wall* surface area where the fire separation distance is 5 feet (1524 mm) or less.
2. Combustible *exterior wall coverings* shall be limited to 40 feet (12 192 mm) in height above grade plane.
3. Combustible *exterior wall coverings* constructed of fire-retardant-treated wood complying with Section 2303.2 for exterior installation shall not be limited in wall surface area where the fire separation distance is 5 feet (1524 mm) or less and shall be permitted up to 60 feet (18 288 mm) in height above grade plane regardless of the fire separation distance. Fire-retardant-treated-wood exterior wall coverings over 40 ft. shall also comply with Section 1402.5.
4. Wood veneers shall comply with Section 1404.5. Fire-retardant-treated-wood veneers over 40-feet shall also comply with Section 1402.5.

Reason:

Fire-retardant-treated wood (FRTW) exterior wall coverings and veneers are permitted to go to a height of 60 ft. on buildings of Type I, II, III and IV construction. However, FRTW is classified as a combustible material . Testing of these combustible exterior wall materials to NFPA 285 on buildings of Type I, II, III and IV construction is required in applications over 40ft unless it meets Exception #2 of 1402.5. This proposal helps to clarify this testing requirement for FRTW.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

This proposal is clarification for what is currenty required in the code.

Internal ID: 1522

FS136-18

IBC: 202, 1406.2, 1408.2, 2602.1

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

2018 International Building Code

Revise as follows:

SECTION 202 DEFINITIONS

[BF] EXTERIOR WALL ENVELOPE. A system or assembly of exterior wall components, including exterior wall ~~finish~~ covering 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.

1406.2 Exterior wall ~~finish.~~covering. MCM used as *exterior wall* ~~finish~~ covering or as elements of balconies and similar projections and bay and oriel windows to provide cladding or weather resistance shall comply with Sections 1406.4 through 1406.14.

1408.2 Exterior wall ~~finish.~~covering. HPL used as *exterior wall covering* or as elements of balconies and similar projections and bay and oriel windows to provide cladding or weather resistance shall comply with Sections 1408.4 through 1408.14.

2602.1 Exterior ~~finish~~ wall covering and architectural trim. See Chapter 14 for requirements for *exterior wall* ~~finish~~ covering and architectural trim.

Reason:

This code change proposal is basically editorial and clarification. The term exterior wall covering is defined in the code, but the term exterior wall finish is not defined. The exterior wall envelope contains exterior wall covering materials and other materials.

Chapter 14, in section 1405, deals with the requirements for combustible exterior wall coverings but there is no section dealing specifically with requirements for exterior wall finish. This may lead to concern that references to exterior wall finish refer to items that are different from those that are regulated by section 1405. The change in terminology may make it clear what is being referenced.

It is the intent of this proposal for "exterior wall covering" to be reflected as a defined term in the definition of Exterior Wall Envelope and sections 1406.2; 1408.2 and 3602.1

The only other place in ICC codes where the term exterior wall finish is used is in the residential code and that will not be addressed in group A.

The additional change in 2602.1 refers to the fact that the requirements in chapter 14 (in sections 1401.1, 1406.3, 1406.10.3, 1408.3 and 1408.10.3) all refer to architectural trim.

Note: This is the current IBC definition for **TRIM:** Picture molds, chair rails, baseboards, handrails, door and window frames and similar decorative or protective materials used in fixed applications.

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 is simply editorial and clarification.

Internal ID: 391

FS137-18

IBC: 1406.8

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

2018 International Building Code

Revise as follows:

1406.8 Fire-resistance rating. Where MCM systems are used on *exterior walls* required to have a *fire-resistance rating* in accordance with Section 705, evidence shall be submitted to the *building official* that the required *fire-resistance rating* is maintained.

Exception: MCM systems which are part of an exterior wall envelope not containing foam plastic insulation~~, which~~ and are installed on the outer surface of a fire-resistance-rated *exterior wall* in a manner such that the attachments do not penetrate through the entire *exterior wall* assembly, shall not be required to comply with this section.

Reason:

The definition of metal composite material (MCM), shown below, does not allow MCMs to contain foam plastic insulation. The definition of metal composite material (MCM) system, also shown below, indicates that this is an exterior wall covering.

Therefore, this section needs clarification because the foam plastic insulation cannot be contained within the MCM system, but foam plastic can be part of the same exterior wall envelope that also includes the MCM system and only if the entire exterior wall envelope does not contain foam plastic insulation is this exception valid.

METAL COMPOSITE MATERIAL (MCM). A factory manufactured panel consisting of metal skins bonded to both faces of a solid plastic core.

METAL COMPOSITE MATERIAL (MCM) SYSTEM. An exterior wall covering fabricated using MCM in a specific assembly including joints, seams, attachments, substrate, framing and other details as appropriate to a particular design.

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.

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 is simply editorial and clarification.

Internal ID: 392

FS138-18

IBC: 1406.9, 1406.9.1 (New), 1406.9.2 (New)

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

2018 International Building Code

Revise as follows:

1406.9 ~~**Surface-burning characteristics.**~~**Fire testing.** Unless otherwise specified, MCM shall ~~have a *flame spread index* of 75 or less and a smoke-developed index of 450 or less when tested in the maximum thickness intended for use in accordance with ASTM E84 or UL 723.~~comply with Sections 1406.9.1 and 1406.9.2.

Add new text as follows:

1406.9.1 Surface burning characteristics. The MCM shall have a flame spread index of 75 or less and a smoke-developed index of 450 or less when tested in the maximum thickness intended for use in accordance with ASTM E84 or UL 723.

1406.9.2 Specifications. MCM shall be required to comply with the following:

1. MCM shall have a self-ignition temperature of 650°F (343°C) or greater where tested in accordance with ASTM D1929.
2. The MCM shall conform to a combustibility classification of CC1.

Class CC1: Plastic materials that have a burning extent of 1 inch (25 mm) or less where tested at a nominal thickness of 0.060 inch (1.5 mm), or in the thickness intended for use, in accordance with ASTM D635.

Reason:

When amendments were proposed to the requirements in the 2009 IBC for MCM (2012 code cycle) the supporting justification was based on existing allowances for light-transmitting plastics included in Chapter 26. Due to substantial losses throughout the world, it has become apparent that the correlation between MCM and Light-transmitting plastics was not a valid comparison as related to fire risk of these very different building materials.

It does not make sense then that MCMs only need to meet the flame spread and ignition test under certain circumstances. They need to meet it always and this proposal adds the requirements in the general section. The requirement for smoke based on either ASTM D2843 or ASTM E84 is not being added because they already need to meet the smoke requirement based on ASTM E84 anyway so duplicate testing would be unnecessary. Of the two requirements based on ASTM D635 (also known as UL 94 HB) used for light-transmitting plastics, the one associated with CC2 (which is much weaker) is not being proposed because it would not be meaningful for a material required to meet a Class B in ASTM E84.

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 increase the cost of construction .

The additional performance and test requirements will add minimal cost to construction for initial testing of an MCM panel.

Internal ID: 393

FS139-18

IBC: 1406.10, 1406.11, 1406.11.1, 1406.11.1.1, 1406.11.1.2, 1406.11.2, 1406.11.2.1, 1406.11.2.2, 1406.11.3, 1406.11.3.1, 1406.11.3.2, 1406.11.3.3, 1406.11.3.4, Delete in entirety., 1406.11.3.5, 1406.11.4, 1406.11.4.1, 1406.11.4.2, 1406.11.4.3, 1406.11.4.4

Proponent: Andy Williams, Metal Construction Association, representing Metal Construction Association (afwilliams@Connect2amc.com)

2018 International Building Code

Revise as follows:

1406.10 Type I, II, III and IV construction. Where installed on buildings of Type I, II, III and IV construction, MCMs and MCM systems shall comply with Sections 1406.10.1 through ~~1406.10.4, or Section 1406.11.~~1406.10.3, for installations up to 40 feet (12 192 mm) above grade plane. Where installed on buildings of Type I, II, III and IV construction, MCMs and MCM systems shall comply with Sections 1406.10.1 through 1406.10.4, for installations greater than 40 feet (12 192 mm) above grade plane.

Delete without substitution:

~~**1406.11 Alternate conditions.**~~
~~MCM and MCM systems shall not be required to comply with Sections 1406.10.1 through 1406.10.4 provided that such systems comply with Section 1406.11.1, 1406.11.2, 1406.11.3 or 1406.11.4.~~

~~**1406.11.1 Installations up to 40 feet in height.** MCM shall not be installed more than 40 feet (12 190 mm) in height above grade where installed in accordance with Sections 1406.11.1.1 and 1406.11.1.2.~~

~~**1406.11.1.1 Fire separation distance of 5 feet or less.** Where the *fire separation distance* is 5 feet (1524 mm) or less, the area of MCM shall not exceed 10 percent of the *exterior wall* surface.~~

~~**1406.11.1.2 Fire separation distance greater than 5 feet.** Where the *fire separation distance* is greater than 5 feet (1524 mm), the area of *exterior wall* surface coverage using MCM shall not be limited.~~

~~**1406.11.2 Installations up to 50 feet in height.** MCM shall not be installed more than 50 feet (15 240 mm) in height above grade where installed in accordance with Sections 1406.11.2.1 and 1406.11.2.2.~~

~~**1406.11.2.1 Self-ignition temperature.** MCM shall have a self-ignition temperature of 650°F (343°C) or greater when tested in accordance with ASTM D1929.~~

~~**1406.11.2.2 Limitations.** Sections of MCM shall not exceed 300 square feet (27.9 m^2) in area and shall be separated by not less than 4 feet (1219 mm) vertically.~~

~~**1406.11.3 Installations up to 75 feet in height (Option 1).** MCM shall not be installed more than 75 feet (22 860 mm) in height above grade plane where installed in accordance with Sections 1406.11.3.1 through 1406.11.3.5.~~
~~**Exception:** Buildings equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1 shall be exempt from the height limitation.~~

~~**1406.11.3.1 Prohibited occupancies.** MCM shall not be permitted on buildings classified as Group A-1, A-2, H, I-2 or I-3 occupancies.~~

~~**1406.11.3.2 Nonfire-resistance-rated exterior walls.** MCM shall not be permitted on *exterior walls* required to have a *fire resistance rating* by other provisions of this code.~~

~~**1406.11.3.3 Specifications.**~~
~~MCM shall be required to comply with all of the following:~~

1. ~~MCM shall have a self ignition temperature of 650°F (343°C) or greater when tested in accordance with ASTM D1929.~~
2. ~~MCM shall conform to one of the following combustibility classifications when tested in accordance with ASTM D635:~~

   ~~Class CC1: Materials that have a burning extent of 1 inch (25 mm) or less when tested at a nominal thickness of 0.060 inch (1.5 mm) or in the thickness intended for use.~~

~~Class CC2: Materials that have a burning rate of $2^1/_2$ inches per minute (1.06 mm/s) or less when tested at a nominal thickness of 0.060 inch (1.5 mm) or in the thickness intended for use.~~

~~**1406.11.3.4 Area limitation and separation.** The maximum area of a single MCM panel and the minimum vertical and horizontal separation requirements for MCM panels shall be as provided for in Table 1406.11.3.4. The maximum percentage of *exterior wall* area of any story covered with MCM panels shall not exceed that indicated in Table 1406.11.3.4 or the percentage of unprotected openings permitted by Section 705.8, whichever is smaller.~~
~~**Exception:** In buildings provided with flame barriers complying with Section 705.8.5 and extending 30 inches (760 mm) beyond the *exterior wall* in the plane of the floor, a vertical separation shall not be required at the floor other than that provided by the vertical thickness of the flame barrier.~~

~~**TABLE 1406.11.3.4**~~

~~**AREA LIMITATION AND SEPARATION REQUIREMENTS FOR MCM PANELS**~~

~~For SI: 1 foot = 304.8 mm, 1 square foot = 0.0929 m^2.~~

~~a.For reductions in the minimum vertical separation, see Section 1406.11.3.4.~~

~~**1406.11.3.5 Automatic sprinkler system increases.** Where the building is equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1, the maximum percentage area of *exterior wall* of any story covered with MCM panels and the maximum square footage of a single area of MCM panels in Table 1406.11.3.4 shall be increased 100 percent. The area of MCM panels shall not exceed 50 percent of the *exterior wall* area of any story or the area permitted by Section 705.8 for unprotected openings, whichever is smaller.~~

~~**1406.11.4 Installations up to 75 feet in height (Option 2).** MCM shall not be installed more than 75 feet (22 860 mm) in height above grade plane where installed in accordance with Sections 1406.11.4.1 through 1406.11.4.4.~~
~~**Exception:** Buildings equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1 shall be exempt from the height limitation.~~

~~**1406.11.4.1 Minimum fire separation distance.** MCM shall not be installed on any wall with a fire separation distance less than 30 feet (9 144 mm).~~
~~**Exception:** Where the building is equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1, the fire separation distance shall be permitted to be reduced to not less than 20 feet (6096 mm).~~

~~**1406.11.4.2 Specifications.**~~
~~MCM shall be required to comply with all of the following:~~

~~**Class CC2:**~~

~~1. MCM shall have a self ignition temperature of 650°F (343°C) or greater when tested in accordance with ASTM D1929.~~

~~2. MCM shall conform to one of the following combustibility classifications when tested in accordance with ASTM D635:~~

~~**Class CC1:** Materials that have a burning extent of 1 inch (25 mm) or less when tested at a nominal thickness of 0.060 inch (1.5 mm), or in the thickness intended for use.~~
~~Materials that have a burning rate of $2^1/_2$ inches per minute (1.06 mm/s) or less when tested at a nominal thickness of 0.060 inch (1.5 mm), or in the thickness intended for use.~~

~~**1406.11.4.3 Area and size limitations.** The aggregate area of MCM panels shall not exceed 25 percent of the area of any *exterior wall* face of the *story* on which those panels are installed. The area of a single MCM panel installed above the first *story* above grade plane shall not exceed 16 square feet (1.5 m^2) and the vertical dimension of a single MCM panel shall not exceed 4 feet (1219 mm).~~
~~**Exception:** Where the building is equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1, the maximum aggregate area of MCM panels shall be increased to 50 percent of the *exterior wall* face of the *story* on which those panels are installed and there shall not be a limit on the maximum dimension or area of a single MCM panel.~~

~~**1406.11.4.4 Vertical separations.** Flame barriers complying with Section 705.8 and extending 30 inches (762 mm) beyond the *exterior wall* or a vertical separation of not less than 4 feet (1219 mm) in height shall be provided to separate MCM panels located on the *exterior walls* at one-story intervals.~~
~~**Exception:** Buildings equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1.~~

Reason:
Fire events around the world have made everyone rethink how MCM panels fit within the construction landscape. While many, if not all, of the fires have involved product and or wall assemblies that would not have been allowed under the IBC, it is clear that there are questions with the allowable use of standard core and fire resistive MCM panels. The MCM Manufacturers that are members of the Metal Construction Association agree that to simplify the application of MCM that Section 1406.11 Alternate conditions, which is based on the allowable use of other combustible exterior envelope material within the IBC, should be removed. This will help to remove questions from both designers and code compliance officials on the appropriate product to use.

The clarification of MCM and MCM systems is added because 1406.10.1 specifically applies to the MCM "panel" (referred to as MCM in the IBC). 1406.10.2 through 1406.10.4 references both MCM and MCM System.

By using the 40 feet above grade plane limit as a trigger for MCM System compliance with NFPA 285, the product decision is simplified and the IBC is made more clear.

The majority of the domestic MCM manufacturers are represented as members of the Metal Construction Association

(MCA)

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

Over time, the material cost difference between standard and fire resistive core has narrowed significantly. The cost difference in the choice of material should be minimal and, in many cases there may be no negative cost impact.

Internal ID: 1273

FS140-18

IBC: 1406.11, 1406.11.1, 1406.11.2, 1406.11.2.1, 1406.11.2.2, 1406.11.3, 1406.11.3.1, 1406.11.3.2, 1406.11.3.3, 1406.11.3.4, TABLE 1406.11.3.4, 1406.11.3.5, 1406.11.4, 1406.11.4.1, 1406.11.4.2, 1406.11.4.3, 1406.11.4.4

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

2018 International Building Code

Revise as follows:

1406.11 Alternate conditions. MCM and MCM systems shall not be required to comply with ~~Sections~~ Section 1406.10.1 ~~through~~ or Section 1406.10.4 provided that such systems comply with Section 1406.11.1~~, 1406.11.2, 1406.11.3 or 1406.11.4~~.

1406.11.1 Installations up to 40 feet in height. MCM and MCM systems shall ~~not be installed more than~~ be limited to installation up to 40 feet (12 190 mm) in height above grade plane where installed in accordance with Sections 1406.8, 1406.9, 1406.10.2, 1406.10.3 and with Sections 1406.11.1.1 and 1406.11.1.2. Such installations shall not be required to comply with Sections 1406.10.1 or 1406.10.4.

Delete without substitution:

~~**1406.11.2 Installations up to 50 feet in height.** MCM shall not be installed more than 50 feet (15 240 mm) in height above grade where installed in accordance with Sections 1406.11.2.1 and 1406.11.2.2.~~

~~**1406.11.2.1 Self-ignition temperature.** MCM shall have a self-ignition temperature of 650°F (343°C) or greater when tested in accordance with ASTM D1929.~~

~~**1406.11.2.2 Limitations.** Sections of MCM shall not exceed 300 square feet (27.9 m^2) in area and shall be separated by not less than 4 feet (1219 mm) vertically.~~

~~**1406.11.3 Installations up to 75 feet in height (Option 1).** MCM shall not be installed more than 75 feet (22 860 mm) in height above grade plane where installed in accordance with Sections 1406.11.3.1 through 1406.11.3.5.~~

~~**Exception:** Buildings equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1 shall be exempt from the height limitation.~~

~~**1406.11.3.1 Prohibited occupancies.** MCM shall not be permitted on buildings classified as Group A-1, A-2, H, I-2 or I-3 occupancies.~~

~~**1406.11.3.2 Nonfire-resistance-rated exterior walls.** MCM shall not be permitted on *exterior walls* required to have a *fire resistance rating* by other provisions of this code.~~

~~**1406.11.3.3 Specifications.** MCM shall be required to comply with all of the following:~~

1. ~~MCM shall have a self-ignition temperature of 650°F (343°C) or greater when tested in accordance with ASTM D1929.~~
2. ~~MCM shall conform to one of the following combustibility classifications when tested in accordance with ASTM D635:~~

   ~~Class CC1: Materials that have a burning extent of 1 inch (25 mm) or less when tested at a nominal thickness of 0.060 inch (1.5 mm) or in the thickness intended for use.~~
   ~~Class CC2: Materials that have a burning rate of $2^1/_2$ inches per minute (1.06 mm/s) or less when tested at a nominal thickness of 0.060 inch (1.5 mm) or in the thickness intended for use.~~

~~**1406.11.3.4 Area limitation and separation.** The maximum area of a single MCM panel and the minimum vertical and horizontal separation requirements for MCM panels shall be as provided for in Table 1406.11.3.4. The maximum percentage of *exterior wall* area of any story covered with MCM panels shall not exceed that indicated in Table 1406.11.3.4 or the percentage of unprotected openings permitted by Section 705.8, whichever is smaller.~~

~~**Exception:** In buildings provided with flame barriers complying with Section 705.8.5 and extending 30 inches (760 mm) beyond the *exterior wall* in the plane of the floor, a vertical separation shall not be required at the floor other than that provided by the vertical thickness of the flame barrier.~~

~~**TABLE 1406.11.3.4**~~

~~**AREA LIMITATION AND SEPARATION REQUIREMENTS FOR MCM PANELS**~~

FIRE SEPARATION DISTANCE (feet)	**COMBUSTIBILITY CLASS OF MCM**	**MAXIMUM PERCENTAGE AREA OF EXTERIOR WALL COVERED WITH MCM PANELS**	**MAXIMUM SINGLE AREA OF MCM PANELS (square feet)**	**MINIMUM SEPARATION OF MCM PANELS (feet)**	
				Vertical	**Horizontal**
Less than 6	—	Not Permitted	Not Permitted	—	—
6 or more but less than 11	CC1	10	50	8	4
	CC2	Not Permitted	Not Permitted	—	—
11 or more but less than or equal to 30	CC1	25	90	6	4
	CC2	15	70	8	4
More than 30	CC1	50	Not Limited	3[a]	0
	CC2	50	100	6[a]	3

~~For SI: 1 foot = 304.8 mm, 1 square foot = 0.0929 m^2.~~

a. ~~For reductions in the minimum vertical separation, see Section 1406.11.3.4.~~

~~**1406.11.3.5 Automatic sprinkler system increases.** Where the building is equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1, the maximum percentage area of *exterior wall* of any story covered with MCM panels and the maximum square footage of a single area of MCM panels in Table 1406.11.3.4 shall be increased 100 percent. The area of MCM panels shall not exceed 50 percent of the *exterior wall* area of any story or the area permitted by Section 705.8 for unprotected openings, whichever is smaller.~~

~~**1406.11.4 Installations up to 75 feet in height (Option 2).** MCM shall not be installed more than 75 feet (22 860 mm) in height above grade plane where installed in accordance with Sections 1406.11.4.1 through 1406.11.4.4.~~

~~**Exception:** Buildings equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1 shall be exempt from the height limitation.~~

~~**1406.11.4.1 Minimum fire separation distance.** MCM shall not be installed on any wall with a fire separation distance less than 30 feet (9 144 mm).~~

~~**Exception:** Where the building is equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1, the fire separation distance shall be permitted to be reduced to not less than 20 feet (6096 mm).~~

~~**1406.11.4.2 Specifications.** MCM shall be required to comply with all of the following:~~

1. ~~MCM shall have a self ignition temperature of 650°F (343°C) or greater when tested in accordance with ASTM D1929.~~
2. ~~MCM shall conform to one of the following combustibility classifications when tested in accordance with ASTM D635:~~
   - ~~**Class CC1:** Materials that have a burning extent of 1 inch (25 mm) or less when tested at a nominal thickness of 0.060 inch (1.5 mm), or in the thickness intended for use.~~
   - ~~**Class CC2:** Materials that have a burning rate of 2$^1/_2$ inches per minute (1.06 mm/s) or less when tested at a nominal thickness of 0.060 inch (1.5 mm), or in the thickness intended for use.~~

~~**1406.11.4.3 Area and size limitations.** The aggregate area of MCM panels shall not exceed 25 percent of the area of any *exterior wall* face of the *story* on which those panels are installed. The area of a single MCM panel installed above the first *story* above grade plane shall not exceed 16 square feet (1.5 m^2) and the vertical dimension of a single MCM panel shall not exceed 4 feet (1219 mm).~~

~~**Exception:** Where the building is equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1, the maximum aggregate area of MCM panels shall be increased to 50 percent of the *exterior wall* face of the *story* on which those panels are installed and there shall not be a limit on the maximum dimension or area of a single MCM panel.~~

~~**1406.11.4.4 Vertical separations.** Flame barriers complying with Section 705.8 and extending 30 inches (762 mm) beyond the *exterior wall* or a vertical separation of not less than 4 feet (1219 mm) in height shall be provided to separate MCM panels located on the *exterior walls* at one-story intervals.~~

~~**Exception:** Buildings equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1.~~

Reason:

This proposal eliminates the current code allowances for alternate fire testing for building heights above 40 feet; current code has allowances for a) installations up to 50 feet and b) installations up to 75 feet – Option1 and Option2.

When MCM systems are installed in buildings of Type I through IV construction they always need to be separated from the interior of the building by a thermal barrier, unless they have been tested by one of the special approval tests, such as a room-corner test (NFPA 286, UL 1040 or UL 1715).

This proposal clarifies that, in buildings of such low heights above grade plane (up to 40 feet), testing to NFPA 285 is not required and a Class B (75 flame spread index) in ASTM E84 is sufficient and a Class A is not needed.

The requirements regarding fire resistance rating in 1406.8 must apply also.

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 increase the cost of construction .

The elimination of the current allowances allowing use of MCM to up to 75 on almost all buildings will lead to a more expensive fire-tested product being required for application above 40 feet.

Internal ID: 396

FS141-18

IBC: 1406.10, 1406.10.1, 1406.10.2, 1406.10.3

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

2018 International Building Code

Revise as follows:

1406.10 Type I, II, III and IV construction. Where installed on buildings of Type I, II, III and IV construction, metal composite material (MCM ~~systems~~) shall comply with Sections 1406.10.1 through ~~1406.10.4~~ 1406.10.3, or Section 1406.11.

1406.10.1 Surface-burning characteristics. MCM shall have a *flame spread index* of not more than 25 and a smoke-developed index of not more than 450 when tested ~~as an assembly~~ in the maximum thickness intended for use in accordance with ASTM E84 or UL 723.

1406.10.2 Thermal barriers. MCM shall be separated from the interior of a building by an approved thermal barrier consisting of 1/2 -inch (12.7 mm) gypsum wallboard or ~~a~~ material that is tested in accordance with and meets the acceptance criteria of both the Temperature Transmission Fire Test and the Integrity Fire Test of NFPA 275.

Exceptions:

1. The MCM system is specifically approved based on tests conducted in accordance with NFPA 286 and with the acceptance criteria of Section 803.1.1.1, UL 1040 or UL 1715. Such testing shall be performed with the MCM in the maximum thickness intended for use. The MCM system shall include seams, joints and other typical details used in the installation and shall be tested in the manner intended for use.
2. The MCM is used as elements of balconies and similar projections, architectural trim or embellishments.

Delete without substitution:

~~**1406.10.3 Thermal barrier not required.** The thermal barrier specified for MCM in Section 1406.10.2 is not required where:~~

1. ~~The MCM system is specifically approved based on tests conducted in accordance with NFPA 286 and with the acceptance criteria of Section 803.1.1.1, UL 1040 or UL 1715. Such testing shall be performed with the MCM in the maximum thickness intended for use. The MCM system shall include seams, joints and other typical details used in the installation and shall be tested in the manner intended for use.~~
2. ~~The MCM is used as elements of balconies and similar projections, architectural *trim* or embellishments.~~

Revise as follows:

~~**1406.10.4**~~**1406.10.3 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.

Reason:

The testing for flame spread of the MCM when installed in buildings of Type I, II, III and IV construction needs to be of the MCM itself (i.e. the sandwich panel alone) and not of the system, which includes a series of other components, per the definitions below. That is why the term MCM is being replaced by “metal composite materials” and the phrase ‘as an assembly” is being removed. This is also consistent with the general testing for “metal composite materials” in section 1406.9.

METAL COMPOSITE MATERIAL (MCM). A factory manufactured panel consisting of metal skins bonded to both faces of a solid plastic core.

METAL COMPOSITE MATERIAL (MCM) SYSTEM. An exterior wall covering fabricated using MCM in a specific assembly including joints, seams, attachments, substrate, framing and other details as appropriate to a particular design.

The code change also moves the requirements to exempt the need from a thermal barrier from Section 1406.10.3 to an

exception to 1406.10.2

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 simply clarifies that the code is requiring the MCM panel to be tested and is editorial for better use and understanding of the requirements in this section

Internal ID: 441

FS142-18

IBC: 1406.11, 1406.11.1, 1406.11.4, 1406.11.4.1, 1406.11.4.2, 1406.11.4.3, 1406.11.4.4

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

2018 International Building Code

Revise as follows:

1406.11 Alternate conditions. MCM and MCM systems shall ~~not~~ be required to comply with Sections ~~1406.10.1 through 1406.10.4 provided that such systems comply with Section~~ 1406.11.1, 1406.11.2 ~~, 1406.11.3 or 1406.11.4.~~ or 1406.11.3, as a function of the height of the installation.

1406.11.1 Installations up to 40 feet in height. MCM shall ~~not~~ be ~~installed more than~~ permitted to be installed up to 40 feet (12 190 mm) in height above grade plane where installed in accordance with Sections 1406.8, 1406.9, 1406.10.2, 1406.10.3 and with Sections 1406.11.1.1 and 1406.11.1.2.

1406.11.1.1 Fire separation distance of 5 feet or less. Where the *fire separation distance* is 5 feet (1524 mm) or less, the area of MCM shall not exceed 10 percent of the *exterior wall* surface.

1406.11.1.2 Fire separation distance greater than 5 feet. Where the *fire separation distance* is greater than 5 feet (1524 mm), the area of *exterior wall* surface coverage using MCM shall not be limited.

Delete without substitution:

~~**1406.11.4 Installations up to 75 feet in height (Option 2).** MCM shall not be installed more than 75 feet (22 860 mm) in height above grade plane where installed in accordance with Sections 1406.11.4.1 through 1406.11.4.4.~~

~~**Exception:** Buildings equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1 shall be exempt from the height limitation.~~

~~**1406.11.4.1 Minimum fire separation distance.** MCM shall not be installed on any wall with a fire separation distance less than 30 feet (9 144 mm).~~

~~**Exception:** Where the building is equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1, the fire separation distance shall be permitted to be reduced to not less than 20 feet (6096 mm).~~

~~**1406.11.4.2 Specifications.** MCM shall be required to comply with all of the following:~~

1. ~~MCM shall have a self ignition temperature of 650°F (343°C) or greater when tested in accordance with ASTM D1929.~~
2. ~~MCM shall conform to one of the following combustibility classifications when tested in accordance with ASTM D635:~~
   - ~~**Class CC1:** Materials that have a burning extent of 1 inch (25 mm) or less when tested at a nominal thickness of 0.060 inch (1.5 mm), or in the thickness intended for use.~~
   - ~~**Class CC2:** Materials that have a burning rate of $2^1/_2$ inches per minute (1.06 mm/s) or less when tested at a nominal thickness of 0.060 inch (1.5 mm), or in the thickness intended for use.~~

~~**1406.11.4.3 Area and size limitations.** The aggregate area of MCM panels shall not exceed 25 percent of the area of any *exterior wall* face of the *story* on which those panels are installed. The area of a single MCM panel installed above the first *story* above grade plane shall not exceed 16 square feet (1.5 m^2) and the vertical dimension of a single MCM panel shall not exceed 4 feet (1219 mm).~~

~~**Exception:** Where the building is equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1, the maximum aggregate area of MCM panels shall be increased to 50 percent of the *exterior wall* face of the *story* on which those panels are installed and there shall not be a limit on the maximum dimension or area of a single MCM panel.~~

~~**1406.11.4.4 Vertical separations.** Flame barriers complying with Section 705.8 and extending 30 inches (762 mm) beyond the *exterior wall* or a vertical separation of not less than 4 feet (1219 mm) in height shall be provided to separate MCM panels located on the *exterior walls* at one-story intervals.~~

~~**Exception:** Buildings equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1.~~

Reason:
If the proposal to eliminate all alternate installations of MCM systems is believed to be too severe a change, a set of three proposals would provide adequate safety for use of these systems. This proposal handles all requirements for MCMs up to 40 ft in height and is followed by proposals that would handle requirements between 40 ft and 50 ft and requirements for installations between 50 ft and 75 ft.

The charging paragraph is proposed to be made into a positive requirement so that each subsection describes the requirements for such installations.

When MCM systems are installed in buildings of Type I through IV construction they always need to be separated from the interior of the building by a thermal barrier, unless they have been tested by one of the special approval tests, such as a room-corner test (NFPA 286, UL 1040 or UL 1715), as explained in sections 1406.10.2 and 1406.10.3. This proposal excludes MCM systems on buildings of such low heights above grade plane from testing to NFPA 285 and requires them to comply with a Class B (75 flame spread index) in ASTM E84 is sufficient and a Class A (as would be required in Section 1406.10.1) is not needed. The requirements regarding fire resistance rating in 1406.8 must apply also.

The revision states which sections need to be complied with and, therefore, a specific statement that MCM systems in installations up to 40 feet in height do not need to comply with NFPA 285 (section 1406.10.4) is not necessary.

The section 1406.11.4 is proposed to be deleted without substitution because both sections 1406.11.3 and 1406.11.4 deal with installations in buildings up to 75 feet in height (and even higher) and the two options need to be consolidated.

No specific information is needed about installations above 75 feet because they need to comply with the general requirements that the entire exterior wall envelope must be tested to NFPA 285 and meet the corresponding requirements.

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

This proposal would impose additional fire safety requirements for MCM systems.

Internal ID: 793

FS143-18

IBC: 1406.11.2, 1406.11.2.1, 1406.11.4, 1406.11.4.1, 1406.11.4.2, 1406.11.4.3, 1406.11.4.4

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

2018 International Building Code

Revise as follows:

1406.11.2 Installations up to 50 feet in height. MCM shall ~~not~~ be permitted to be installed ~~more than~~ up to 50 feet (15 240mm) in height above grade plane where installed in accordance with Sections ~~1406.11.2.1 and 1406.11.2.2.~~1406.8, 1406.9, 1406.10.1 through 1406.10.3 and with Section 1406.11.2.1. In such installations, the MCM systems on their own shall not be required to comply with Section 1406.10.4, but the entire exterior wall envelope shall be required to be tested with and comply with the acceptance criteria of NFPA 285,

Delete without substitution:

~~**1406.11.2.1 Self-ignition temperature.** MCM shall have a self-ignition temperature of 650°F (343°C) or greater when tested in accordance with ASTM D1929.~~

Revise as follows:

~~**1406.11.2.2**~~**1406.11.2.1 Limitations.** Sections of MCM shall not exceed 300 square feet (27.9 m^2) in area and shall be separated by not less than 4 feet (1219 mm) vertically.

Delete without substitution:

~~**1406.11.4 Installations up to 75 feet in height (Option 2).** MCM shall not be installed more than 75 feet (22 860 mm) in height above grade plane where installed in accordance with Sections 1406.11.4.1 through 1406.11.4.4.~~

~~**Exception:** Buildings equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1 shall be exempt from the height limitation.~~

~~**1406.11.4.1 Minimum fire separation distance.** MCM shall not be installed on any wall with a fire separation distance less than 30 feet (9 144 mm).~~

~~**Exception:** Where the building is equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1, the fire separation distance shall be permitted to be reduced to not less than 20 feet (6096 mm).~~

~~**1406.11.4.2 Specifications.** MCM shall be required to comply with all of the following:~~

1. ~~MCM shall have a self-ignition temperature of 650°F (343°C) or greater when tested in accordance with ASTM D1929.~~
2. ~~MCM shall conform to one of the following combustibility classifications when tested in accordance with ASTM D635:~~
   - ~~**Class CC1:** Materials that have a burning extent of 1 inch (25 mm) or less when tested at a nominal thickness of 0.060 inch (1.5 mm), or in the thickness intended for use.~~
   - ~~**Class CC2:** Materials that have a burning rate of $2^1/_2$ inches per minute (1.06 mm/s) or less when tested at a nominal thickness of 0.060 inch (1.5 mm), or in the thickness intended for use.~~

~~**1406.11.4.3 Area and size limitations.** The aggregate area of MCM panels shall not exceed 25 percent of the area of any *exterior wall* face of the *story* on which those panels are installed. The area of a single MCM panel installed above the first *story* above grade plane shall not exceed 16 square feet (1.5 m^2) and the vertical dimension of a single MCM panel shall not exceed 4 feet (1219 mm).~~

~~**Exception:** Where the building is equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1, the maximum aggregate area of MCM panels shall be increased to 50 percent of the *exterior wall* face of the *story* on which those panels are installed and there shall not be a limit on the maximum dimension or area of a single MCM panel.~~

~~**1406.11.4.4 Vertical separations.** Flame barriers complying with Section 705.8 and extending 30 inches (762 mm) beyond the *exterior wall* or a vertical separation of not less than 4 feet (1219 mm) in height shall be provided to separate MCM panels located on the *exterior walls* at one-story intervals.~~

~~**Exception:** Buildings equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1.~~

Reason:
If it is believed that eliminating all alternate provisions for the use of MCM systems is too severe a change, this is the second of three proposals that provide an alternate approach to use these systems with added fire safety requirements. This proposal deals with systems to be installed at heights of 40 to 50 ft.

When MCM systems are installed in buildings of Type I through IV construction they always need to be separated from the interior of the building by a thermal barrier, unless they have been tested by one of the special approval tests, such as a room-corner test (NFPA 286, UL 1040 or UL 1715). Also, in buildings above 40 ft (and up to 50 ft) a Class A (25 flame spread index) in ASTM E84 is required but that testing to NFPA 285 is not required if there is a sufficient area limitation. The section on ignition temperature is proposed to be eliminated because it should apply to all MCM systems. The requirements regarding fire resistance rating in 1406.8 must apply also. The requirements regarding ignition temperature need to apply to all MCM, irrespective of height where they are installed.

The MCM systems themselves are not required to be tested to NFPA 285. However, the proposed wording clarifies that the entire exterior wall envelope must be tested to NFPA 285.

The alternate approach in sections 1406.11.4 is proposed to be deleted because it does not provide sufficient fire safety.

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

This proposal imposes additional fire safety requirements for MCM systems.

Internal ID: 795

FS144-18

IBC: 1406.11.3, 1406.11.3.1 (New), 1406.11.3.1.1, 1406.11.3.1.2, 1406.11.3.3, 1406.11.3.1.3, TABLE 1406.11.3.1.3, 1406.11.3.1.4, 1406.11.3.2 (New), 1406.11.3.2.1 (New), 1406.11.3.2.2 (New)

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

2018 International Building Code

Revise as follows:

1406.11.3 Installations between 50 ft and up to 75 feet in ~~height (Option 1).~~height. ~~MCM~~ MCMs shall ~~not be installed more than~~ be permitted to be installed between 50 feet (15 240 mm) and up to 75 feet (22 860 mm) in height above grade plane where installed in accordance with Sections ~~1406.11.3.1 through 1406.11.3.5.~~**~~Exception:~~** ~~Buildings equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1 shall be exempt from the height limitation.~~
1406.8, 1406.9, 1406.10.1, 1406.10.2, 1406.10.3, and also either 1406.11.3.1 or 1406.11.3.2. In such installations, the MCMs on their own shall not be required to comply with Section 1406.10.4, but the entire exterior wall envelope shall be required to be tested with, and comply with the acceptance criteria of, NFPA 285.

Add new text as follows:

1406.11.3.1 Fire separations not exceeding 30 ft. For buildings with fire separations not exceeding 30 feet (9 144 mm), MCMs shall be permitted up to a height of 75 feet where installed in accordance with Sections 1406.11.3.1.1 through 1406.11.3.1.4.

Revise as follows:

~~1406.11.3.1~~1406.11.3.1.1 Prohibited occupancies. ~~MCM~~ MCMs shall not be permitted on buildings classified as Group A-1, A-2, H, I-2 or I-3 occupancies.

~~1406.11.3.2~~1406.11.3.1.2 Nonfire-resistance-rated exterior walls. ~~MCM~~ MCMs shall not be permitted on *exterior walls* required to have a *fire-resistance rating* by other provisions of this code.

Delete without substitution:

~~1406.11.3.3 Specifications.~~ ~~MCM shall be required to comply with all of the following:~~

1. ~~MCM shall have a self-ignition temperature of 650°F (343°C) or greater when tested in accordance with ASTM D1929.~~
2. ~~MCM shall conform to one of the following combustibility classifications when tested in accordance with ASTM D635:~~

   ~~Class CC1: Materials that have a burning extent of 1 inch (25 mm) or less when tested at a nominal thickness of 0.060 inch (1.5 mm) or in the thickness intended for use.~~
   ~~Class CC2: Materials that have a burning rate of $2^1/_2$ inches per minute (1.06 mm/s) or less when tested at a nominal thickness of 0.060 inch (1.5 mm) or in the thickness intended for use.~~

Revise as follows:

~~1406.11.3.4~~1406.11.3.1.3 Area limitation and separation. The maximum area of a single MCM ~~panel~~ system and the minimum vertical and horizontal separation requirements for MCM ~~panels~~ systems shall be as provided for in Table ~~1406.11.3.4.~~ 1406.11.3.1.3. The maximum percentage of *exterior wall* area on each side of any story covered with MCM ~~panels~~ systems shall not exceed that indicated in Table ~~1406.11.3.4~~ 1406.11.3.1.3 or the percentage of unprotected openings permitted by Section 705.8, whichever is smaller.

Exception: In buildings provided with flame barriers complying with Section 705.8.5 and extending 30 inches (760 mm) beyond the *exterior wall* in the plane of the floor, a vertical separation shall not be required at the floor other than that provided by the vertical thickness of the flame barrier.

TABLE ~~1406.11.3.4~~ 1406.11.3.1.3
AREA LIMITATION AND SEPARATION REQUIREMENTS FOR MCM ~~PANELS~~SYSTEMS

FIRE SEPARATION DISTANCE (feet)	**COMBUSTIBILITY CLASS OF MCM**	MAXIMUM PERCENTAGE AREA OF EXTERIOR WALL COVERED WITH MCM SYSTEMS	MAXIMUM SINGLE AREA OF MCM SYSTEMS (square feet)	MINIMUM SEPARATION OF MCM SYSTEMS (feet)	
				Vertical	**Horizontal**
Less than 6	-	Not Permitted	Not Permitted	-	-
6 or more but less than 11	CC1	10	50	8	4
	CC2	Not Permitted	Not Permitted	Not Permitted	Not Permitted
11 or more but less than or equal to 30	CC1	25	90	6	4
	CC2	Not Permitted	Not Permitted	Not Permitted	Not Permitted
More than 30	CC1	50	Not Limited	3[a]	0
	CC2	Not Permitted	Not Permitted	Not Permitted	Not Permitted

For SI: 1 foot = 304.8 mm, 1 square foot = 0.0929 m^2.

a. For reductions in the minimum vertical separation, see Section ~~1406.11.3.4.~~1406.11.3.1.3.

~~1406.11.3.5~~1406.11.3.1.4 Automatic sprinkler system increases. Where the building is equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1, the maximum percentage area of *exterior wall* on each side of any story covered with MCM ~~panels~~ systems and the maximum square footage of a single area of MCM ~~panels~~ systems in Table ~~1406.11.3.4~~ 1406.11.3.1.3 shall be increased 100 percent. The area of MCM ~~panels~~ systems shall not exceed 50 percent of the *exterior wall* area on each side of any story or the area permitted by Section 705.8 for unprotected openings, whichever is smaller.

Add new text as follows:

1406.11.3.2 Fire separations exceeding 30 feet.. For buildings with fire separations exceeding 30 feet (9 144 mm), MCM shall be permitted where installed in accordance with Sections 1406.11.3.2.1 and 1406.11.3.2.2.

Exception: Where the building is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1, the maximum aggregate area of MCM systems shall be increased to 50 percent of the exterior wall face on each side of the story on which those MCM systems are installed and there shall not be a limit on the maximum dimension or area of a single MCM system.

1406.11.3.2.1 Area and size limitations. . The aggregate area of MCM systems shall not exceed 25 percent of the area of any exterior wall face of the story on which those MCM systems are installed. The area of a single MCM system installed above the first story above grade plane shall not exceed 16 square feet (1.5 m^2) and the vertical dimension of a single MCM system shall not exceed 4 feet (1219 mm).

1406.11.3.2.2 Vertical separations. Flame barriers complying with Section 705.8 and extending 30 inches (762 mm) beyond the exterior wall or a vertical separation of not less than 4 feet (1219 mm) in height shall be provided to separate MCM systems located on the exterior walls at one-story intervals.

Reason:

This proposal contains all the requirements for installation of MCMs above 50 feet, if the committee is inclined not to prohibit all such installations. It eliminates the concept of "option 1" and "option 2".

The proposal does not permit exceptions for MCM installations based purely on the use of sprinklers inside the building. The proposal eliminates sprinkler exceptions from present sections 1406.11.3, 1406.11.4, 1406.11.4.1 and 1406.11.4.4. That means that there will be no blanket sprinkler exceptions for height limitations, vertical separations or fire separation distances. The reason for this is that sprinklers inside a building will not affect flame spread along the outside of the building and therefore the presence of sprinklers inside the building should not provide exception from testing to NFPA 285 or from height limitations. Sprinklers do not control outside fires. Allowance is retained for increasing areas of MCMs when the building is fully protected by sprinklers. It seems reasonable that sprinkler protection should allow greater areas of MCM use.

The proposal requires that any time the installation exceeds 75 feet the MCM system itself must be tested to NFPA 285 (as well as testing the entire exterior wall envelope to NFPA 285).

For installations between 50 ft and 75 feet it allows two options depending on whether the separation between buildings is over or under 30 feet.

For separations below 30 feet allowances are made with much more restricted areas and MCM systems are not allowed to be used if they only comply with CC2. Also it is made clear that the area limitations apply to every side of the building. Also, there are prohibited occupancies (A-1, A-2, H, I-2 and I-3, just like in the 2018 code) and MCMs cannot be installed if a fire resiistance rating is required.

For separations above 30 feet MCMs are permitted with some severe area limitations, mirroring what is allowed today, but without the excessive exceptions for sprinklers inside the building.

The full text as the code would read if this is approved is attached.

Cost Impact

The code change proposal will increase the cost of construction .

This proposal, which is the third of a group of 3 proposals on MCMs, will require more fire testing of these systems and result in better fire safety.

Internal ID: 848

FS145-18

IBC: 1406.11.3, 1406.11.4

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

2018 International Building Code

Revise as follows:

1406.11.3 Installations up to 75 feet in height (Option 1). MCM shall not be installed more than 75 feet (22 860 mm) in height above grade plane where installed in accordance with Sections 1406.11.3.1 through 1406.11.3.5.
~~**Exception:** Buildings equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1 shall be exempt from the height limitation.~~

1406.11.4 Installations up to 75 feet in height (Option 2). MCM shall not be installed more than 75 feet (22 860 mm) in height above grade plane where installed in accordance with Sections 1406.11.4.1 through 1406.11.4.4.
~~**Exception:** Buildings equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1 shall be exempt from the height limitation.~~

Reason:
This code change proposal removes the height exception for sprinklered buildings

MCM systems are the only systems in Chapter 14 of the IBC where the presence of sprinklers inside the building is the reason to eliminate the height and coverage limitations associated with fires along the exterior wall envelope. Such an exception that allows buildings of unlimited height to be used with MCM systems as part of the exterior wall envelope based on the presence of sprinklers inside the building is inappropriate because there is no fire department access for those buildings above 75 feet Note that installations that comply with the 1406.11 sections are not required to be tested to NFPA 285. This proposal removes the blanket sprinkler exceptions for height limitations. The reason for this is 1) that interior sprinkler systems for high rise buildings are not intended to control outside exposure fires and 2) therefore, sprinklers inside a building have a limited affect upon flame spread along the outside of the building. the presence of sprinklers inside the building should not provide a full exception from testing to NFPA 285 or from height limitations necessary to ensure a minimum level of safety.

According to an NFPA study published in 2014 (Fire Hazards of Exterior Wall Assemblies Containing Combustible Components), slightly more than half of the exterior facade fires originated from interior ignition. Sprinklers will help restrict an interior fire from reaching the exterior facade, but will have limited effect on exterior ignition or fire spread across combustible exterior wall assemblies..

Also keep in mind that when these fires occur, occupants have little choice but to evacuate and stairs are not designed for full building evacuation. It can be expected that evacuating occupants will encounter stairs overflowing with other evacuating occupants. As observed during the 63 story Address Hotel fire in Dubai on New Year’s Eve 2015, these situations increase the tendency to panic and cause crushes. In addition, most stair pressurization systems take outside air from the roof, which can be expected to bring in contaminated air, decreasing the level of comfort for evacuating occupants. And, those aren't even the worst scenarios. When occupants evacuate stair enclosures at grade, they are greeted with flaming debris raining down on them.

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 increase the cost of construction .

The elimination of the exception allowing use of MCM to any height on a sprinklered building may lead to a more expensive fire-tested product being required for application above 75 feet.

Internal ID: 394

FS146-18

IBC: 1406.13

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

2018 International Building Code

Revise as follows:

1406.13 Foam plastic insulation. Where MCM systems are included in an exterior wall envelope containing foam plastic insulation, the exterior wall envelope shall also comply with the requirements of Section 2603.

Reason:

This code change proposal clarifies when foam plastic insulation is permitted. By definition, foam plastic cannot be contained within the MCM system, but foam plastic can be part of the same exterior wall envelope that also includes the MCM system and the entire exterior wall envelope must then be tested appropriately as indicated in section 2603

The definition of metal composite material (MCM), shown below, does not allow MCMs to contain foam plastic insulation. The definition of metal composite material (MCM) system, also shown below, indicates that this is an exterior wall covering. However, section 2603.5 indicates that, whenever foam plastic insulation is included in exterior walls (meaning exterior wall envelopes) the exterior wall envelope must be tested to NFPA 285. Moreover, sections 2603.3 and 2603.4 indicate that the foam plastic insulation itself must meet the requirements of class B (flame spread index of 75 and smoke developed index of 450) when tested to ASTM E84, and the foam plastic insulation must be separated from the interior of the building by a thermal barrier (with some exceptions).

METAL COMPOSITE MATERIAL (MCM). A factory manufactured panel consisting of metal skins bonded to both faces of a solid plastic core.

METAL COMPOSITE MATERIAL (MCM) SYSTEM. An exterior wall covering fabricated using MCM in a specific assembly including joints, seams, attachments, substrate, framing and other details as appropriate to a particular design.

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.

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 is simply editorial and clarification.

Internal ID: 395

FS147-18

IBC: 1408.10.3

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

2018 International Building Code

Revise as follows:

1408.10.2 Thermal barriers. HPL shall be separated from the interior of a building by an approved thermal barrier consisting of $^1/_2$-inch (12.7 mm) gypsum wallboard or a material that is tested in accordance with and meets the acceptance criteria of both the Temperature Transmission Fire Test and the Integrity Fire Test of NFPA 275.

1408.10.3 Thermal barrier not required. The thermal barrier specified for HPL in Section 1408.10.2 is not required where:

1. The HPL system is specifically approved based on tests conducted in accordance with NFPA 286, and with the acceptance criteria of Section 803.1.2.1, or with UL 1040 or UL 1715. Such testing shall be performed with the HPL in the minimum and maximum thicknesses intended for use. The HPL system shall include seams, joints and other typical details used in the installation and shall be tested in the manner intended for use.
2. The HPL is used as elements of balconies and similar projections, architectural *trim* or embellishments.

Reason:

This code change proposal makes a revision regarding the reference to testing in accordance with UL 1040 and UL 1715. The references are retained but the option is added to use NFPA 286, with the corresponding criteria (in section 803.1.1.1), to be consistent with other references to UL 1040 and UL 1715.

NFPA 286 was developed long after UL 1040 and UL 1715 and was not therefore included in every section of the code. However, now NFPA 286 is used much more widely than UL 1040 or UL 1715. No other change is made in 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/

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

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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 adds a reference to NFPA 286 which is a comparable test to the existing UL tests and the rest of the

change is editorial for clarification.

Internal ID: 399

FS148-18

IBC: 1408.10.3

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

2018 International Building Code

Revise as follows:

1408.10.3 Thermal barrier not required. The thermal barrier specified for HPL in Section 1408.10.2 is not required where:

1. The HPL system is specifically approved based on tests conducted in accordance with NFPA 286, and with the acceptance criteria of Section 803.1.2.1, or with UL 1040 or UL 1715. Such testing shall be performed with the HPL in the minimum and maximum thicknesses intended for use. The HPL system shall include seams, joints and other typical details used in the installation and shall be tested in the manner intended for use.
2. The HPL is used as elements of balconies and similar projections, architectural *trim* or embellishments.

Reason:
This proposal makes a revision regarding the reference to testing in accordance with UL 1040 and UL 1715. The references are retained but the option is added to use NFPA 286, with the corresponding criteria (in section 803.1.2.1), to be consistent with other references to UL 1040 and UL 1715. NFPA 286 was developed long after UL 1040 and UL 1715 and was not therefore included in every section of the code. However, now NFPA 286 is used much more widely than UL 1040 or UL 1715.

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

This proposal offers an additional option for fire testing, which is likely to be less expensive and more modern.

Internal ID: 1171

FS149-18

IBC: 1408.10.4.1 (New), 2603.5.5.1 (New), Chapter 35

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

2018 International Building Code

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.

Add new text as follows:

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. (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

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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.

Internal ID: 1918

FS150-18

IBC: 1408.11, 1408.11.1, 1408.11.2, 1408.11.2.1, 1408.11.2.2

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

2018 International Building Code

Revise as follows:

1408.11 Alternate conditions. HPL and HPL systems shall not be required to comply with Sections 1408.10.1 through 1408.10.4 provided that such systems comply with Section 1408.11.1 ~~or 1408.11.2~~.

1408.11.1 Installations up to 40 feet in height. HPL shall ~~not~~ be ~~installed more than~~ permitted to be installed up to 40 feet (12 190 mm) in height above grade plane where installed in accordance with ~~Sections 1408.11.1.1 and 1408.11.1.2.~~ Section 1408.11.1.1 or with Section 1408.11.1.2.

1408.11.1.1 Fire separation distance of 5 feet or less. Where the fire separation distance is 5 feet (1524 mm) or less, the area of HPL shall not exceed 10 percent of the *exterior wall* surface.

1408.11.1.2 Fire separation distance greater than 5 feet. Where the fire separation distance is greater than 5 feet (1524 mm), the area of *exterior wall* surface coverage using HPL shall not be limited.

Delete without substitution:

~~**1408.11.2 Installations up to 50 feet in height.** HPL shall not be installed more than 50 feet (15 240 mm) in height above grade plane where installed in accordance with Sections 1408.11.2.1 and 1408.11.2.2.~~

~~**1408.11.2.1 Self-ignition temperature.** HPL shall have a self-ignition temperature of 650°F (343°C) or greater when tested in accordance with ASTM D1929.~~

~~**1408.11.2.2 Limitations.** Sections of HPL shall not exceed 300 square feet (27.9 m^2) in area and shall be separated by a minimum 4 feet (1219 mm) vertically.~~

Reason:

This proposal makes one change, consistent with the intent of ensuring that all combustible materials on the exterior walls are tested to NFPA 285 and for consistency with other sections of the code. This proposal is Intended to address concerns with current language and requirements that could lead to fires like the one in Grenfell Tower (London, England).

The exception for HPL systems up to 50 ft in height to be tested to NFPA 285 is eliminated, consistent with the requirement that all combustibles exceeding 40 ft in height shall be tested. The testing for self-ignition temperature based on ASTM D1929 is not a very robust fire test and is not sufficient to provide assurance of adequate fire performance. The added criteria in the section proposed to be deleted do not ensure that there will be no flame spread upwards or sideways, as would be detected when testing to NFPA 285.

Note: Current IBC definitions:

HIGH-PRESSURE DECORATIVE EXTERIORGRADE COMPACT LAMINATE (HPL).

Panels consisting of layers of cellulose fibrous material impregnated with thermosetting resins and bonded together by a high-pressure process to form a homogeneous nonporous core suitable for exterior use.

HIGH-PRESSURE DECORATIVE EXTERIORGRADE COMPACT LAMINATE (HPL) YSTEM. An exterior wall covering fabricated using HPL in a specific assembly including

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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 increase the cost of construction .

The elimination of the current allowances allowing use of HPL to up to 50 on almost all buildings will lead to a more expensive fire-tested product being required for HPL application above 40 feet as fire testing to NFPA 285 will be required.

Internal ID: 397

FS151-18

IBC: 1408.11, 1408.11.1, 1408.11.2, 1408.11.2.1, 1408.11.2.2

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

2018 International Building Code

Revise as follows:

1408.11 Alternate conditions. HPL and HPL systems shall not be required to comply with Sections 1408.10.1 through 1408.10.4 provided that such systems comply with Section ~~1408.11.1 or 1408.11.2.~~1408.11.1.

1408.11.1 Installations up to 40 feet in height. HPL shall ~~not~~ be ~~installed more than~~ permitted to be installed up to 40 feet (12 190 mm) in height above grade plane where installed in accordance with ~~Sections~~ Section 1408.11.1.1 ~~and~~ or with Section 1408.11.1.2.

1408.11.1.1 Fire separation distance of 5 feet or less. Where the fire separation distance is 5 feet (1524 mm) or less, the area of HPL shall not exceed 10 percent of the *exterior wall* surface.

1408.11.1.2 Fire separation distance greater than 5 feet. Where the fire separation distance is greater than 5 feet (1524 mm), the area of *exterior wall* surface coverage using HPL shall not be limited.

Delete without substitution:

~~**1408.11.2 Installations up to 50 feet in height.** HPL shall not be installed more than 50 feet (15 240 mm) in height above grade plane where installed in accordance with Sections 1408.11.2.1 and 1408.11.2.2.~~

~~**1408.11.2.1 Self-ignition temperature.** HPL shall have a self-ignition temperature of 650°F (343°C) or greater when tested in accordance with ASTM D1929.~~

~~**1408.11.2.2 Limitations.** Sections of HPL shall not exceed 300 square feet (27.9 m^2) in area and shall be separated by a minimum 4 feet (1219 mm) vertically.~~

Reason:

This proposal makes a change consistent with the intent of ensuring that all combustible materials on the exterior walls are tested to NFPA 285 and for consistency with other sections of the code. This proposal is Intended to address concerns with current language and requirements that could lead to fires like the one in Grenfell Tower (London, England). The exception for HPL systems up to 50 ft in height that allows them to avoid having to be tested to NFPA 285 is eliminated, consistent with the requirement that all combustibles exceeding 40 ft in height shall be tested. The testing for self ignition temperature based on ASTM D1929 is not a very robust fire test and is not sufficient to provide assurance of adequate fire performance. The added criteria in the section proposed to be deleted do not ensure that there will be no flame spread upwards or sideways, as would be detected when testing to NFPA 285.

This means that all installations above 40 ft in height must be tested to NFPA 285.

Cost Impact

The code change proposal will increase the cost of construction .

The proposal will require that HPL systems used in construction over 40 ft in height must be tested to NFPA 285.

Internal ID: 1170

FS152-18

IBC: 1505.9

Proponent: Jonathan Roberts, UL LLC, representing UL LLC (jonathan.roberts@ul.com)

2018 International Building Code

Revise as follows:

[BF] 1505.9 Rooftop mounted photovoltaic panel systems. Rooftop rack-mounted *photovoltaic panel systems* shall be tested, *listed* and identified with a fire classification in accordance with UL ~~1703 and UL~~ 2703. The fire classification shall comply with Table 1505.1 based on the type of construction of the building.

Reason:

Fire classification for rooftop rack-mounted photovoltaic panel systems are determined in accordance with UL 2703.

UL 1703 includes partial fire testing of the photovoltaic panel, which is one of the components of the photovoltaic panel system. UL 2703 uses the results of that component testing, and includes further evaluation and testing of the photovoltaic panel system (i.e. the photovoltaic panel and the rack support system) to establish the Fire Classification for the system. UL 1703 is referenced within UL 2703.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

Fire classification of these systems are determined in accordance with UL 2703 currently.

Internal ID: 1300

FS153-18

IBC: 202, 905.3.8, 1505.10, 1507.16, 1507.16.1, TABLE 1607.1, 1607.13.3;

IFC: 317, 317.1, 317.2, 317.3, 317.4.3, 504.3, 905.3.8

Proponent: Jonathan Siu, City of Seattle Department of Construction and Inspections, representing Washington Association of Building Officials Technical Code Development Committee (Jon.Siu@seattle.gov)

2018 International Building Code

SECTION 202 DEFINITIONS

Revise as follows:

[BS] LIVE LOAD, ROOF. A load on a roof produced:

1. During maintenance by workers, equipment and materials;
2. During the life of the structure by movable objects such as planters or other similar small decorative appurtenances that are not occupancy related; or
3. By the use and occupancy of the roof such as for ~~roof gardens~~ landscaped roofs or assembly areas.

[F] 905.3.8 ~~Rooftop gardens and landscaped~~ Landscaped roofs. Buildings or structures that have ~~rooftop gardens or~~ landscaped roofs and that are equipped with a standpipe system shall have the standpipe system extended to the roof level on which the ~~rooftop garden or~~ landscaped roof is located.

[BF] 1505.10 ~~Roof gardens and landscaped~~ Landscaped roofs. ~~Roof gardens and landscaped~~ Landscaped roofs shall comply with Section 1505.1 and 1507.16 and shall be installed in accordance with ANSI/SPRI VF-~~1.~~1.

1507.16 Vegetative roofs ~~, roof gardens~~ and landscaped roofs. *Vegetative roofs*~~, roof gardens~~ and landscaped roofs shall comply with the requirements of this chapter, Section 1607.13.3 and the International Fire Code.

[BF] 1507.16.1 Structural fire resistance. The structural frame and roof construction supporting the load imposed on the roof by the *vegetative roof*~~, roof gardens~~ or landscaped roofs shall comply with the requirements of Table ~~601.~~601.

TABLE 1607.1
MINIMUM UNIFORMLY DISTRIBUTED LIVE LOADS, L0, AND MINIMUM CONCENTRATED LIVE LOADSg

For SI: 1 inch = 25.4 mm, 1 square inch = 645.16 mm^2,

1 square foot = 0.0929 m^2,

1 pound per square foot = 0.0479 kN/m^2, 1 pound = 0.004448 kN,

1 pound per cubic foot = 16 kg/m^3.

a. Floors in garages or portions of buildings used for the storage of motor vehicles shall be designed for the uniformly distributed live loads of this table or the following concentrated loads: (1) for garages restricted to passenger vehicles accommodating not more than nine passengers, 3,000 pounds acting on an area of $4^1/_2$ inches by $4^1/_2$ inches; (2) for mechanical parking structures without slab or deck that are used for storing passenger vehicles only, 2,250 pounds per wheel.

b. The loading applies to stack room floors that support nonmobile, double-faced library book stacks, subject to the following limitations:

   1. The nominal book stack unit height shall not exceed 90 inches.
   2. The nominal shelf depth shall not exceed 12 inches for each face.
   3. Parallel rows of double-faced book stacks shall be separated by aisles not less than 36 inches wide.

c. Design in accordance with ICC 300.

d. Other uniform loads in accordance with an approved method containing provisions for truck loadings shall be considered where appropriate.

e. The concentrated wheel load shall be applied on an area of 4.5 inches by 4.5 inches.

f. The minimum concentrated load on stair treads shall be applied on an area of 2 inches by 2 inches. This load need not be assumed to act concurrently with the uniform load.

g. Where snow loads occur that are in excess of the design conditions, the structure shall be designed to support the loads due to the increased loads caused by drift buildup or a greater snow design determined by the building official (see Section 1608).

h. See Section 1604.8.3 for decks attached to exterior walls.

i. Uninhabitable attics without storage are those where the maximum clear height between the joists and rafters is less than 42 inches, or where there are not two or more adjacent trusses with web configurations capable of accommodating an assumed rectangle 42 inches in height by 24 inches in width, or greater, within the plane of the trusses. This live load need not be assumed to act concurrently with any other live load requirements.

j. Uninhabitable attics with storage are those where the maximum clear height between the joists and rafters is 42 inches or greater, or where there are two or more adjacent trusses with web configurations capable of accommodating an assumed rectangle 42 inches in height by 24 inches in width, or greater, within the plane of the trusses.

   The live load need only be applied to those portions of the joists or truss bottom chords where both of the following conditions are met:

   i. The attic area is accessible from an opening not less than 20 inches in width by 30 inches in length that is located where the clear height in the attic is not less than 30 inches.
   ii. The slopes of the joists or truss bottom chords are not greater than two units vertical in 12 units horizontal.

   The remaining portions of the joists or truss bottom chords shall be designed for a uniformly distributed concurrent live load of not less than 10 pounds per square foot.

k. Attic spaces served by stairways other than the pull-down type shall be designed to support the minimum live load specified for habitable attics and sleeping rooms.

l. Areas of occupiable roofs, other than ~~roof gardens~~ landscaped roofs and assembly areas, shall be designed for appropriate loads as approved by the building official. Unoccupied landscaped areas of roofs shall be designed in accordance with Section 1607.13.3.

m. Live load reduction is not permitted.

n. Live load reduction is only permitted in accordance with Section 1607.11.1.2 or Item 1 of Section 1607.11.2.

o. Live load reduction is only permitted in accordance with Section 1607.11.1.3 or Item 2 of Section

1607.11.2.

1607.13.3 Occupiable roofs. Areas of roofs that are occupiable, such as *vegetative roofs*, ~~roof gardens~~ landscaped roofs or for assembly or other similar purposes, and marquees are permitted to have their uniformly distributed live loads reduced in accordance with Section 1607.11.

2018 International Fire Code

Revise as follows:

SECTION 317 ~~ROOFTOP GARDENS AND~~ LANDSCAPED ROOFS

317.1 General. ~~Rooftop gardens and landscaped~~ Landscaped roofs shall be installed and maintained in accordance with Sections 317.2 through 317.5 and Sections 1505 and 1507.16 of the International Building Code.

317.2 ~~Rooftop garden or landscaped~~ Landscaped roof size. ~~Rooftop garden or landscaped~~ Landscaped roof areas shall not exceed 15,625 square feet (1450 m^2) in size for any single area with a maximum dimension of 125 feet (39 m) in length or width. A minimum 6-foot-wide (1.8 m) clearance consisting of a Class A-rated roof system complying with ASTM E108 or UL 790 shall be provided between adjacent ~~rooftop gardens or~~ landscaped roof areas.

317.3 Rooftop structure and equipment clearance. For all ~~vegetated roofing systems~~ vegetative roofs abutting combustible vertical surfaces, a Class A-rated roof system complying with ASTM E108 or UL 790 shall be achieved for a minimum 6-foot-wide (1829 mm) continuous border placed around rooftop structures and all rooftop equipment including, but not limited to, mechanical and machine rooms, penthouses, skylights, roof vents, solar panels, antenna supports and building service equipment.

317.4.3 Maintenance plan. The *fire code official* is authorized to require a maintenance plan for vegetation placed on roofs due to the size of a landscaped roof ~~garden~~, materials used or where a fire hazard exists to the building or exposures due to the lack of maintenance.

504.3 Stairway access to roof. New buildings four or more stories above grade plane, except those with a roof slope greater than four units vertical in 12 units horizontal (33.3-percent slope), shall be provided with a *stairway* to the roof. *Stairway* access to the roof shall be in accordance with Section 1011.12. Such *stairway* shall be marked at street and floor levels with a sign indicating that the *stairway* continues to the roof. Where roofs are used for ~~roof gardens~~ landscaped roofs or for other purposes, *stairways* shall be provided as required for such occupancy classification.

905.3.8 ~~Rooftop gardens and landscaped~~ Landscaped roofs. Buildings or structures that have ~~rooftop gardens or~~ landscaped roofs and that are equipped with a standpipe system shall have the standpipe system extended to the roof level on which the ~~rooftop garden or~~ landscaped roof is located.

Reason:

This proposal is purely editorial, aligning terms and replacing two undefined terms with one.

While "vegetative roof" is a defined term (essentially part of the building envelope) the I-codes usually, but not always, use the undefined terms "roof garden" and "landscaped roofs" in conjunction with each other ("roof gardens and landscaped roofs"). Occasionally, they appear in conjunction with "vegetative roof." Based on the context of use, it appears the accepted concept is roof gardens and landscaped roofs are not part of the building envelope--they do not contribute to the waterproofing of the building--but instead are plantings that are placed on top of the roof system. Since neither term is defined, this code change simply chooses "landscaped roof" over "roof garden," as we think landscaping is the more generic term.

We believe we have correctly identified every place this change is necessary across the I-codes, based on word searches for forms of "vegetative," "landscape," and "garden," but this proposal only addresses changes to be made in the Group A codes. We are planning to submit a separate code change proposal to coordinate the terms in the IECC in Group B. Note the terms appear in IBC Section 1607.13.3.1 and IECC Section CA103, but these are not being changed, as none was necessary.

The other editorial change is in IFC 317.3, where "vegetated roofing system" is replaced with the defined term, "vegetative roof."

If direction is given by the Committee, we would be willing to submit a proposal for consideration by the Admin Committee in Group B that would define "landscaped roof," but we have chosen not to at this time in order to preserve the editorial nature of the proposal.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

Because this proposal is purely editorial, there is no cost impact.

Internal ID: 242

FS154-18

IBC: 1509, 1509.1, 1509.2, 1509.3, 1509.4

Proponent: Jason Wilen AIA CDT RRO, National Roofing Contractors Association (NRCA), representing National Roofing Contractors Association (NRCA) (jwilen@nrca.net)

2018 International Building Code

Delete without substitution:

~~**SECTION 1509 RADIANT BARRIERS INSTALLED ABOVE DECK**~~

~~**[BF] 1509.1 General.** A *radiant barrier* installed above a deck shall comply with Sections 1509.2 through 1509.4.~~

~~**[BF] 1509.2 Fire testing.** *Radiant barriers* shall be permitted for use above decks where the *radiant barrier* is covered with an *approved* roof covering and the system consisting of the *radiant barrier* and the roof covering complies with the requirements of either FM 4450 or UL 1256.~~

~~**[BF] 1509.3 Installation.** The low emittance surface of the *radiant barrier* shall face the continuous airspace between the *radiant barrier* and the roof covering.~~

~~**[BF] 1509.4 Material standards.** A *radiant barrier* installed above a deck shall comply with ASTM C1313/1313M.~~

Reason:

The radiant barriers section was added to the 2015 edition of IBC based on a proposal from the Reflective Insulation Manufacturer Association (RIMA). After receiving a number of questions from contractors; especially about the installation requirements in section 1509.3, NRCA contacted RIMA in an effort understand the intent of their original code proposal. As part of those discussions it was agreed that Section 1509 should be removed, and revised text will be submitted by RIMA to relocate and clarify radiant barrier provisions to IBC Section 1507.3—Clay and Concrete Tile as the above-roof deck application of the material is intended to be used exclusively with this roof covering.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

The proposed change does not increase the stringency of the code.

Internal ID: 1199

FS155-18

IBC: 202 (New), 2603.1.1 (New), Chapter 35, ordinal

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.

Internal ID: 1347

FS156-18

IBC: 2603.4.1.5

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

2018 International Building Code

Revise as follows:

2603.4.1.5 Roofing. A thermal barrier is not required for foam plastic insulation that is a part of a Class A, B or C roof-covering assembly that is installed in accordance with the code and the manufacturer's instructions and is either constructed as described in Item 1 or tested as described in Item 2.

1. The roof assembly is separated from the interior of the building by an approved thermal barrier of 1/2" gypsum board or a material that is tested in accordance with and meets the acceptance criteria of both the Temperature Transmission Fire Test and the Interior Test of NFPA 275 and wood structural panel sheathing not less than 0.47 inch (11.9 mm) in thickness bonded with exterior glue, with edges supported by blocking, tongue-and-groove joints, other approved type of edge support or an equivalent material.
2. The assembly with the foam plastic insulation satisfactorily passes NFPA 276 or UL 1256.

Reason:
In Chapter 26 of the International Building Code, the addition of either a 1/2" gypsum board or materials that would also comply based on testing should be allowed. This provides equal opportunity for all types of materials to protect foam roofing insulation from fire.

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

This proposal will increase the cost of construction by about $1.00 - $1.25US per square foot of roof area.

Internal ID: 1734

FS157-18

IBC: 2603.5, 2603.5.1, 2603.5.2, 2603.5.3, 2603.5.4, 2603.5.5, 2603.5.6, 2603.5.7, 2603.5 (New), 2603.5.1 (New), 2603.5.2 (New), 2603.5.2.1 (New), 2603.5.3 (New), 2603.5.4 (New), 2603.5.4.1 (New), 2603.5.4.2 (New), 2603.5.4.3 (New), 2603.5.5 (New), 2603.5.5.1 (New), 2603.5.5.2 (New), 2603.5.5.3 (New), 2603.5.5.4 (New)

Proponent: John Woestman, Kellen Co., representing Extruded Polystyrene Foam Association (XPSA) (jwoestman@kellencompany.com)

2018 International Building Code

Delete and substitute as follows:

~~**2603.5 Exterior walls of buildings of any height.** *Exterior walls* of buildings of Type I, II, III or IV construction of any height shall comply with Sections 2603.5.1 through 2603.5.7. *Exterior walls* of cold storage buildings required to be constructed of noncombustible materials, where the building is more than one *story* in height, shall comply with the provisions of Sections 2603.5.1 through 2603.5.7. *Exterior walls* of buildings of Type V construction shall comply with Sections 2603.2, 2603.3 and 2603.4. Fireblocking shall be in accordance with Section 718.2.~~

2603.5 Exterior walls of buildings of any height.
Exterior walls of buildings of Type I, II, III or IV construction of any height shall comply with Sections 2603.5.1 through 2603.5.7. *Exterior walls* of cold storage buildings required to be constructed of noncombustible materials, where the building is more than one *story* in height, shall comply with the provisions of Sections 2603.5.1 through 2603.5.7. *Exterior walls* of buildings of Type V construction shall comply with Sections 2603.2, 2603.3 and 2603.4. Fireblocking shall be in accordance with Section 718.2.

Delete without substitution:

~~**2603.5.1 Fire-resistance-rated walls.** Where the wall is required to have a fire-resistance rating, data based on tests conducted in accordance with ASTM E119 or UL 263 shall be provided to substantiate that the fire-resistance rating is maintained.~~

~~**2603.5.2 Thermal barrier.** Any foam plastic insulation shall be separated from the building interior by a thermal barrier meeting the provisions of Section 2603.4, unless special approval is obtained on the basis of Section 2603.9.~~

~~**Exception:** One-story buildings complying with Section 2603.4.1.4.~~

~~**2603.5.3 Potential heat.** The potential heat of foam plastic insulation in any portion of the wall or panel shall not exceed the potential heat expressed in Btu per square feet (mJ/m^2) of the foam plastic insulation contained in the wall assembly tested in accordance with Section 2603.5.5. The potential heat of the foam plastic insulation shall be determined by tests conducted in accordance with NFPA 259 and the results shall be expressed in Btu per square feet (mJ/m^2).~~

~~**Exception:** One-story buildings complying with Section 2603.4.1.4.~~

~~**2603.5.4 Flame spread and smoke-developed indices.** Foam plastic insulation, exterior coatings and facings shall be tested separately in the thickness intended for use, but not to exceed 4 inches (102 mm), and shall each have a flame spread index of 25 or less and a smoke-developed index of 450 or less as determined in accordance with ASTM E84 or UL 723.~~

~~**Exception:** Prefabricated or factory-manufactured panels having minimum 0.020-inch (0.51 mm) aluminum facings and a total thickness of $^1/_4$ inch (6.4 mm) or less are permitted to be tested as an assembly where the foam plastic core is not exposed in the course of construction.~~

~~**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).~~

~~**2603.5.6 Label required.** The edge or face of each piece, package or container of foam plastic insulation shall bear the *label* of an *approved agency*. The *label* shall contain the manufacturer's or distributor's identification, model number, serial number or definitive information describing the product or materials' performance characteristics and *approved agency*'s identification.~~

~~**2603.5.7 Ignition.** *Exterior walls* shall not exhibit sustained flaming where tested in accordance with NFPA 268. Where a material is intended to be installed in more than one thickness, tests of the minimum and maximum thickness intended for use shall be performed.~~

~~**Exception:** Assemblies protected on the outside with one of the following:~~

1. ~~A thermal barrier complying with Section 2603.4.~~
2. ~~A minimum 1 inch (25 mm) thickness of concrete or masonry.~~
3. ~~Glass-fiber-reinforced concrete panels of a minimum thickness of $^{3}/_{8}$ inch (9.5 mm).~~
4. ~~Metal-faced panels having minimum 0.019-inch-thick (0.48 mm) aluminum or 0.016-inch-thick (0.41 mm) corrosion-resistant steel outer facings.~~
5. ~~A minimum $^{7}/_{8}$ inch (22.2 mm) thickness of stucco complying with Section 2510.~~
6. ~~A minimum $^{1}/_{4}$ inch (6.4 mm) thickness of fiber cement lap, panel or shingle siding complying with Section 1404.16 and Section 1404.16.1 or 1404.16.2.~~

Add new text as follows:

2603.5 Exterior walls containing foam plastic insulation. Exterior walls containing foam plastic insulation shall comply with Section 2603.5.1, or Section 2603.5.2 or Section 2603.5.3. Fireblocking shall be in accordance with Section 718.2.

2603.5.1 Buildings of Type I, II, III or IV construction of any height. Exterior wall assemblies with foam plastic insulation of buildings of Type I, II, III or IV construction of any height shall comply with Section 2603.5.4. The foam plastic insulation component shall comply with Section 2603.5.5.

2603.5.2 Exterior walls of buildings of Type V construction of any height. Foam plastic insulation used in exterior walls of buildings of Type V construction shall comply with Sections 2603.2, 2603.3 and 2603.4.

2603.5.2.1 Fire-resistance-rated walls. Where the exterior wall is required to have a fire-resistance rating, data based on tests conducted in accordance with ASTM E119 or UL 263 shall be provided to substantiate that the fire-resistance rating is maintained.

2603.5.3 Cold storage buildings of noncombustible materials more than one story in height. Exterior wall assemblies containing foam plastic insulation on cold storage buildings required to be constructed of noncombustible materials, where the building is more than one story in height, shall comply with Section 2603.5.4. The foam plastic insulation component shall comply with Section 2603.5.5.

2603.5.4 Exterior wall test requirements. Where exterior walls of buildings are required to comply with Sections 2603.5.1 or 2603.5.3, the wall assembly shall comply with Sections 2603.5.4.1 through 2603.5.4.3.

2603.5.4.1 Fire-resistance-rated walls. Where the exterior wall is required to have a fire-resistance rating, data based on tests conducted in accordance with ASTM E119 or UL 263 shall be provided to substantiate that the fire-resistance rating is maintained.

2603.5.4.2 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 foam plastic 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).

2603.5.4.3 Ignition. The exterior wall assembly shall not exhibit sustained flaming where tested in accordance with NFPA 268. Where the foam plastic insulation is intended to be installed in more than one thickness, tests of the minimum and maximum thickness intended for use shall be performed.

Exceptions:

1. A thermal barrier complying with Section 2603.4.
2. A minimum 1-inch (25 mm) thickness of concrete or masonry.
3. Glass-fiber-reinforced concrete panels of a minimum thickness of 3/8 inch (9.5 mm).
4. Metal-faced panels having minimum 0.019-inch-thick (0.48 mm) aluminum or 0.016-inch-thick (0.41 mm) corrosion-resistant steel outer facings.
5. A minimum 7/8-inch (22.2 mm) thickness of stucco complying with Section 2510.
6. A minimum 1/4-inch (6.4 mm) thickness of fiber- cement lap, panel or shingle siding complying with Section 1404.16 and Section 1404.16.1 or 1404.16.2.

2603.5.5 Foam plastic insulation used in exterior walls. Where exterior walls of buildings are required to comply with Sections 2603.5.1 or 2603.5.3, the foam plastic insulation component shall comply with Sections 2603.5.5.1 through 2603.5.5.4.

2603.5.5.1 Thermal barrier. Any foam plastic insulation shall be separated from the building interior by a thermal barrier meeting the provisions of Section 2603.4, unless special approval is obtained on the basis of Section 2603.9.

Exception: One-story buildings complying with Section 2603.4.1.4...

2603.5.5.2 Potential heat. The potential heat of foam plastic insulation in any portion of the wall or panel shall not exceed the potential heat expressed in Btu per square feet (mJ/m^2) of the foam plastic insulation contained in the wall assembly tested in accordance with Section 2603.5.4.2. The potential heat of the foam plastic insulation shall be determined by tests conducted in accordance with NFPA 259 and the results shall be expressed in Btu per square feet (mJ/m^2).
Exception: One-story buildings complying with Section 2603.4.1.4.

2603.5.5.3 Flame spread and smoke-developed indices. Foam plastic insulation, and exterior coatings and facings shall be tested separately in the thickness intended for use, but not to exceed 4 inches (102 mm), and each shall have 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.

Exception: Prefabricated or factory-manufactured panels having minimum 0.020-inch (0.51 mm) aluminum facings and a total thickness of 1/4 inch (6.4 mm) or less are permitted to be tested as an assembly where the foam plastic core is not exposed in the course of construction.

2603.5.5.4 Label required. The edge or face of each piece, package or container of foam plastic insulation shall bear the label of an approved agency. The label shall contain the manufacturer's or distributor's identification, model number, serial number or definitive information describing the product or materials' performance characteristics and approved agency's identification.

Reason:
With recent fire incidents, there has been increased attention on the fire performance of exterior walls containing combustible materials, such as foam plastic insulation. The 2018 IBC charging section, Section 2603.5, contains 3 different exterior walls, each with separate requirements, causing misunderstanding. Furthermore, sections related to requirements for the foam plastic component of the exterior wall are sprinkled throughout the section, causing additional confusion. This code change is a reorganization of the exterior wall section. No technical changes are included.

Separate sections are provided for

1. Exterior walls of Type I, II, III, IV construction of buildings of **any** height; (Note that the exception for one story buildings **applies only to those specifically described in Section 2603.4.1.4**)

2. Exterior walls of buildings of Type V construction has the appropriate pointers to the foam insulation requirements.

3. Exterior walls of cold storage buildings of noncombustible construction and more than one story in height;

Exterior wall assembly tests for exterior walls of Type I, II, III, IV construction of buildings of **any** height and exterior walls of cold storage buildings of noncombustible construction and more than one story in height are consolidated in Section 2603.5.4. Similarly, all testing requirements for the foam plastic insulation components for these building types are listed in Section 2603.5.5.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

No technical changes are intended to be included in this proposal.

Internal ID: 2341

FS158-18

IBC: 2606.7.4, Chapter 35, 35

Proponent: Jonathan Roberts, UL LLC, representing UL LLC (jonathan.roberts@ul.com)

2018 International Building Code

Revise as follows:

2606.7.4 Fire suppression system. In buildings that are equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1, plastic light-diffusing systems shall be protected both above and below unless the sprinkler system has been specifically approved for installation only above the light-diffusing ~~system.~~ system, or the light-diffusing system is listed and labeled in accordance with UL 723S. Areas of light-diffusing systems that are protected in accordance with this section shall not be limited.

Add new standard(s) follows:

CHAPTER 35 REFERENCED STANDARDS

UL

UL LLC
333 Pfingsten Road
Northbrook IL 60062-2096

723S-2006:

Drop-Out Ceilings Installed Beneath Automatic Sprinklers

Reason:
Section 2606.7.4 currently states plastic light-diffusing systems shall be protected both above and below unless the sprinkler system has been specifically approved for installation only above the light-diffusing system. This language places the burden for approving a system on the code official without providing any guidance on which to make that decision. This proposal is intended to provide the option of using a science based method for approving a drop-out light diffusing ceiling system listed and labeled for use beneath sprinkler systems.

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

The use of a drop-out ceiling system listed and labeled to UL 723S is being offered as an option to the use of a specifically approved sprinkler system already permitted in this Section. In addition, although UL 723S is not currently specified in the code, such listings have been used for years to approve drop-out ceiling systems. As such, this proposal does not mandate any change in construction practices.

Analysis: A review of the standard proposed for inclusion in the code, UL 723S-2006, 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.

Internal ID: 375

FS159-18

IBC: 2607.3, 2607.5

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

2018 International Building Code

Revise as follows:

2607.3 Height limitation. Light-transmitting plastics shall not be installed more than 75 feet (22 860 mm) above *grade plane*~~, except as allowed by Section 2607.5~~.

2607.5 Automatic sprinkler system. Where the building is equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1, the maximum percentage area of *exterior wall* in any *story* in light-transmitting plastic wall panels and the maximum square footage of a single area given in Table 2607.4 shall be increased 100 percent, but the area of light-transmitting plastic wall panels shall not exceed 50 percent of the wall area in any story, or the area permitted by Section 705.8 for unprotected openings, whichever is smaller. These installations shall ~~be exempt from height limitations.~~<u>not be installed more than 75 feet (22 860 mm) above grade plane.</u>

Reason:

This proposal eliminates the permission for light transmitting wall panels to be installed in unlimited heights when the building is protected by sprinklers. This is consistent with the proposed change for MCMs in chapter 14. There should be no allowance to use light transmitting wall panels in unlimited heights simply because of sprinkler exceptions, since sprinklers do not control outside fires.

According to an NFPA study published in 2014 (Fire Hazards of Exterior Wall Assemblies Containing Combustible Components), slightly more than half of the exterior facade fires originated from interior ignition. Sprinklers will help restrict an interior fire from reaching the exterior facade, but will have limited effect on exterior ignition or fire spread across combustible assemblies.

Also keep in mind that when these fires occur, occupants have little choice but to evacuate and stairs are not designed for full building evacuation. It can be expected that evacuating occupants will encounter stairs overflowing with other evacuating occupants. As observed during the 63 story Address Hotel fire in Dubai on New Year's Eve 2015, these situations increase the tendency to panic and cause crushes. In addition, most stair pressurization systems take outside air from the roof, which can be expected to bring in contaminated air, decreasing the level of comfort for evacuating occupants. And, those aren't even the worst scenarios. When occupants evacuate stair enclosures at grade, they are greeted with flaming debris raining down on them.

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 increase the cost of construction .

The elimination of the current allowances allowing use of light transmitting plastics above 75 on almost all buildings which are equipped with fire sprinklers will lead to a more expensive fire-tested product being required for application above 40 feet.

Internal ID: 398

FS160-18

IBC: 2610.1, 2610.1.1 (New)

Proponent: Mike Fischer, Kellen Company, representing The Plastic Glazing Coalition of the American Chemistry Council (mfischer@kellencompany.com)

2018 International Building Code

Revise as follows:

2610.1 Light-transmitting plastic glazing of skylight assemblies. Skylight assemblies glazed with light-transmitting plastic shall conform to the provisions of this section and Section 2606. ~~Unit skylights glazed with light-transmitting plastic shall comply with Section 2405.5~~.

Exception: Skylights in which the light-transmitting plastic conforms to the required roof-covering class in accordance with Section 1505.

Add new text as follows:

2610.1.1 Unit skylights. Unit skylights glazed with light-transmitting plastic shall comply with Section 2405.5.

Reason:

One of the problems with exceptions to code requirements is they are often unclear. In Section 2610.1, the code contains three provisions for light-transmitting plastics in skylights - compliance with Sections 2606, 2610, and 2405.5.

The exception covers skylights that meet the roof covering classifications in Section 1505 but fails to say exactly which provisions the skylights are exempted from. Is it Section 2405.5? Would a Class A Fire rating exempt the skylight from requirements? We think not.

It seems obvious that the intent of the code is not to exempt unit skylights from the requirements found in Section 2405.5. This proposal makes that important distinction. Furthermore, the intent was also to allow materials that can meet the roof assembly fire classification requirements to avoid additional testing that is redundant to the classification testing. Code officials should not have to study the code to infer what simple code language can easily state.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

The proposal is editorial in nature and makes no technical changes to the code.

Internal ID: 2047

FS161-18

IBC: 2613.2

Proponent: Jonathan Roberts, UL LLC, representing UL LLC (jonathan.roberts@ul.com)

2018 International Building Code

Revise as follows:

2613.2 Labeling and identification. Fiber-reinforced polymers shall be listed. Packages and containers of *fiber-reinforced polymer* and their components ~~delivered to the job site~~ shall bear the label of an approved agency showing the manufacturer's name, product listing, product identification and information sufficient to determine that the end use will comply with the code requirements.

Reason:

This proposal is intended to clarify these products shall be both listed and labeled. This terminology is consistent with the definitions of these terms and their use in numerous other Sections of the code.

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

The changes are editorial and do not change construction requirements.

Internal ID: 376