IBC - Fire Safety

2024 GROUP A PROPOSED CHANGES TO THE I-CODES

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2024 GROUP A – PROPOSED CHANGES TO THE INTERNATIONAL BUILDING CODE – FIRE SAFETY

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TENTATIVE ORDER OF DISCUSSION
2024 PROPOSED CHANGES TO THE INTERNATIONAL BUILDING CODE – FIRE SAFETY

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.

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IBC: 703.2.1.2

Proponents: Tim Earl, GBH International, the Gypsum Association (tearl@gbhint.com)

2024 International Building Code

Revise as follows:

703.2.1.2 Combustible components.
Combustible aggregates are permitted in gypsum concrete and ~~P~~portland cement concrete mixtures for fire-resistance-rated construction. Any component material or admixture is permitted in assemblies if the resulting tested assembly meets the *fire-resistance* test requirements of this code.

Reason: This section clearly applies to poured cement mixtures. However, a reader may unintentionally read it as applying to any gypsum product, including gypsum panels, which is not intended. The addition of the word “concrete” will eliminate this possibility. Also, portland cement should not be capitalized.

Cost Impact: The change proposal is editorial in nature or a clarification and has no cost impact on the cost of construction

Justification for no cost impact:

This is simply clarifying the application of this section and correcting a capitalization error.

FS2-24

IBC: 703.2.1.3

Proponents: Stephen Szoke, American Concrete Institute, American Concrete Institute (steve.szoke@concrete.org); Shamim Rashid-Sumar, National Ready Mixed Concrete Association, National Ready Mixed Concrete Association (ssumar@nrmca.org)

2024 International Building Code

Revise as follows:

703.2.1.3 Restrained classification.
Fire-resistance-rated assemblies tested under ASTM E119 or UL 263 shall not be considered to be restrained unless evidence satisfactory to the *building official* is furnished by the *registered design professional* showing that the construction qualifies for a restrained classification in accordance with ASTM E119 or UL 263. Restrained construction shall be identified on the *construction documents*.

Exception: Unless otherwise determined by the *registered design professional*, concrete girders, beams, and slabs connected to structural concrete framing or structural concrete walls in accordance with ACI 318 shall be considered restrained. Restrained concrete construction shall be identified on the *construction documents*.

Reason: This code change proposal does not alter the technical requirements of the code. The exception is simply to avoid sending the Registered Design Professional (RDP) to ASTM E119 to discover that all concrete connections designed in accordance with ACI 318 restrain movement relative to the supporting structural members. This is consistent with the classification described in ASM E119 Standard Test Methods for Fire Tests of Building Construction and Materials. Appendix X3 Guide for Determining Condition of Restrain for Floor and Roof Assemblies and for Individual Beams of ASTM E119 advises that concrete framing is to be considered restrained for:

(1) Beams fastened to the framing members,

(2) All types of concrete cast-in-place floor or roof construction (such as beam-and-slabs, flat slabs, pan joists, and waffle slabs) where the floor or roof construction is cast with the framing members

(3) Interior and exterior spans of precast construction with cast-in-place joints resulting in restraint equivalent to that which would exist in condition (1).

(4) All types of prefabricated floor or roof construction where the structural members are secured to such construction.

The minimum structural integrity requirements of ACI 318 are such that horizontal structural concrete elements are required to have connections restraining movement relative to the supporting structural member. ACI 318 Table 4.10.2.1 – Minimum requirements for structural integrity based on member type directs the RDP to the appropriate structural integrity sections of ACI 318:

Nonprestressed one-way cast-in-place slabs – 7.7.7

Nonprestressed two-way slabs – 8.7.4.2

Prestressed two-way slabs – 8.7.5.6

Nonprestresssed two-way joint systems – 8.8.1.6

Cast-in-place beam – 9.7.7

Nonprestressed one-way joint system – 9.8.1.6

Precast joint and connection – 16.2.1.8

For those interested in the minimum structural integrity requirements of ACI 318, they are as follows:

Nonprestressed one-way cast-in-place slabs

7.7.7 *Structural integrity reinforcement in cast-in-place one-way slabs*

7.7.7.1 Longitudinal structural integrity reinforcement consisting of at least one-quarter of the maximum positive moment reinforcement shall be continuous.

7.7.7.2 Longitudinal structural integrity reinforcement at noncontinuous supports shall be anchored to develop f_y at the face of the support.

7.7.7.3 If splices are necessary in continuous structural integrity reinforcement, the reinforcement shall be spliced near supports. Splices shall be mechanical or welded in accordance with 25.5.7 or Class B tension lap splices in accordance with 25.5.2.

Nonprestressed two-way slabs

8.7.4.2 *Structural integrity*

8.7.4.2.1 All bottom deformed bars or deformed wires within the column strip, in each direction, shall be continuous or spliced using mechanical or welded splices in accordance with 25.5.7 or Class B tension lap splices in accordance with 25.5.2. Splices shall be located in accordance with Fig. 8.7.4.1.3.

8.7.4.2.2 At least two of the column strip bottom bars or wires in each direction shall pass within the region bounded by the longitudinal reinforcement of the column and shall be anchored at exterior supports.

Prestressed two-way slabs

8.7.5.6 *Structural integrity*

8.7.5.6.1 Except as permitted in 8.7.5.6.3, at least two tendons with 1/2 in. diameter or larger strand shall be placed in each direction at columns in accordance with (a) or (b):

(a) Tendons shall pass through the region bounded by the longitudinal reinforcement of the column.

(b) Tendons shall be anchored within the region bounded by the longitudinal reinforcement of the column, and the anchorage shall be located beyond the column centroid and away from the anchored span.

8.7.5.6.2 Outside of the column and shear cap faces, the two structural integrity tendons required by **8.7.5.6.1** shall pass under any orthogonal tendons in adjacent spans.

8.7.5.6.3 Slabs with tendons not satisfying 8.7.5.6.1 shall be permitted if bonded bottom deformed reinforcement is provided in each direction in accordance with 8.7.5.6.3.1 through 8.7.5.6.3.3.

8.7.5.6.3.1 Minimum bottom deformed reinforcement A_s in each direction shall be the larger of (a) and (b). The value of *fy* shall be limited to a maximum of 80,000 psi:

(a) $A_s = [4.5 (f_c')^{0.5} c_2 d]/f_y$ (8.7.5.6.3.1a)

(b) $A_s = [300 c_2 d/f_y]$ (8.7.5.6.3.1b)

where c_2 is measured at the column faces through which the reinforcement passes.

8.7.5.6.3.2 Bottom deformed reinforcement calculated in 8.7.5.6.3.1 shall pass within the region bounded by the longitudinal reinforcement of the column and shall be anchored at exterior supports.

8.7.5.6.3.3 Bottom deformed reinforcement shall be anchored to develop f_y beyond the column or shear cap face.

Nonprestresssed two-way joint systems

8.8.1.6 For structural integrity, at least one bottom bar in each joist shall be continuous and shall be anchored to develop fy at the face of supports.

Cast-in-place beam

9.7.7 Structural integrity reinforcement in cast-in-place beams

9.7.7.1 For beams along the perimeter of the structure, structural integrity reinforcement shall be in accordance with (a) through (c):

(a) At least one-quarter of the maximum positive moment reinforcement, but not less than two bars or strands, shall be continuous

(b) At least one-sixth of the negative moment reinforcement at the support, but not less than two bars or strands, shall be continuous

(c) Longitudinal structural integrity reinforcement shall be enclosed by closed stirrups in accordance with 25.7.1.6 or hoops along the

clear span of the beam

9.7.7.2 For other than perimeter beams, structural integrity reinforcement shall be in accordance with (a) or (b):

(a) At least one-quarter of the maximum positive moment reinforcement, but not less than two bars or strands, shall be continuous.

(b) Longitudinal reinforcement shall be enclosed by closed stirrups in accordance with 25.7.1.6 or hoops along the clear span of the beam.

9.7.7.3 Longitudinal structural integrity reinforcement shall pass through the region bounded by the longitudinal reinforcement of the column.

9.7.7.4 Longitudinal structural integrity reinforcement at noncontinuous supports shall be anchored to develop f_y at the face of the support.

9.7.7.5 If splices are necessary in continuous structural integrity reinforcement, the reinforcement shall be spliced in accordance with (a) and (b):

(a) Positive moment reinforcement shall be spliced at or near the support

(b) Negative moment reinforcement shall be spliced at or near midspan

9.7.7.6 Splices shall be mechanical or welded in accordance with 25.5.7 or Class B tension lap splices in accordance with 25.5.2.

Nonprestressed one-way joint system

9.8.1.6 For structural integrity, at least one bottom bar in each joist shall be continuous and shall be anchored to develop fy at the face of supports

Precast joint and connection

16.2.1.8 Integrity ties shall be provided in the vertical, longitudinal, and transverse directions and around the perimeter of a structure in accordance with 16.2.4 or 16.2.5

16.2.4 *Minimum connection strength and integrity tie requirements*

16.2.4.1 Except where the provisions of 16.2.5 govern, longitudinal and transverse integrity ties shall connect precast members to a lateral-force-resisting system, and vertical integrity ties shall be provided in accordance with 16.2.4.3 to connect adjacent floor and roof levels.

16.2.4.2 Where precast members form floor or roof diaphragms, the connections between the diaphragm and those members being laterally supported by the diaphragm shall have a nominal tensile strength of not less than 300 lb per linear ft.

16.2.4.3 Vertical integrity ties shall be provided at horizontal joints between all vertical precast structural members, except cladding, and shall satisfy (a) or (b):

(a) Connections between precast columns shall have vertical integrity ties, with a nominal tensile strength of at least $200A_g$ lb, where A_g is the gross area of the column. For columns with a larger cross section than required by consideration of loading, a reduced effective area based on the cross section required shall be permitted. The reduced effective area shall be at least one-half the gross area of

the column.

(b) Connections between precast wall panels shall have at least two vertical integrity ties, with a nominal tensile strength of at least 10,000 lb per tie.

16.2.5 Integrity tie requirements for precast concrete bearing wall structures three stories or more in height.

16.2.5.1 Integrity ties in floor and roof systems shall satisfy (a) through (f):

(a) Longitudinal and transverse integrity ties shall be provided in floor and roof systems to provide a

nominal tensile strength of at least 1500 lb per foot of width or length.

(b) Longitudinal and transverse integrity ties shall be provided over interior wall supports and between the floor or roof system and exterior walls.

(c) Longitudinal and transverse integrity ties shall be positioned in or within 2 ft of the plane of the floor or roof system.

(d) Longitudinal integrity ties shall be oriented parallel to floor or roof slab spans and shall be spaced not greater than 10 ft on center.

Provisions shall be made to transfer forces around openings.

(e) Transverse integrity ties shall be oriented perpendicular to floor or roof slab spans and shall be spaced not greater than the bearing wall spacing.

(f) Integrity ties at the perimeter of each floor and roof, within 4 ft of the edge, shall provide a nominal tensile strength of at least 16,000 lb.

16.2.5.2 Vertical integrity ties shall satisfy (a) through (c):

(a) Integrity ties shall be provided in all wall panels and shall be continuous over the height of the building.

(b) Integrity ties shall provide a nominal tensile strength of at least 3000 lb per horizontal foot of wall.

(c) At least two integrity ties shall be provided in each wall panel.

Cost Impact: The change proposal is editorial in nature or a clarification and has no cost impact on the cost of construction

Justification for no cost impact:

No technical change to the provisions of the code. Proposal simply adds language to IBC that reflects the nature of the provisions in ASTM E119

FS2-24

FS3-24

IBC: 703.2.2, ASTM Chapter 35 (New)

Proponents: Marcelo Hirschler, GBH International, GBH International (mmh@gbhint.com)

2024 International Building Code

Revise as follows:

703.2.2 Analytical methods.

The fire resistance of *building elements*, components or assemblies established by an analytical method shall be by any of the methods listed in this section, based on the fire exposure and acceptance criteria specified in ASTM E119 or UL 263.

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. Extension of fire resistance rating data obtained from tests in accordance with ASTM E119 or UL 263 for beams, floor and roof assemblies, columns; walls, and partitions, based on the principles contained in ASTM E2032.
5. ~~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.
6. ~~5.~~ *Fire-resistance* designs certified by an *approved agency*.

Add new standard(s) as follows:

ASTM

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

E2032	Standard Practice for Extension of Data From Fire Resistance Tests Conducted in Accordance with ASTM E 119 (2021)

Staff Analysis: A review of the standard proposed for inclusion in the code, ASTM E2032 Standard Practice for Extension of Data From Fire Resistance Tests Conducted in Accordance with ASTM E 119 (2021), with regard to some of the key ICC criteria for referenced standards (Section 4.6 of CP#28) will be posted on the ICC website on or before March 18, 2024.

Reason: ASTM E2032, Standard Practice for Extension of Data From Fire Resistance Tests Conducted in Accordance with ASTM E 119, has long been used to calculate fire resistance rating data for certain assemblies, as an extension of data obtained from actual fire resistance tests. ASTM E2032 cannot be used unless fire tests in accordance with ASTM E119 (or its equivalent, UL 263) have been successfully conducted.

This proposal, with the same intent, is different from proposal FS3-21, which was disapproved by a vote of 7-6.

1. ASTM E2032 is now a practice (and not a guide) and contains mandatory information and requirements.

2. The language proposed is based on the actual scope of ASTM E2032 (section 1.4, see below).

3. The new option (which is not a requirement) is placed ahead of the generic "engineering analysis" in item 4 (now item 5). It is one of the engineering analyses options.

4. The proposal contains reference to both ASTM E119 and UL 263, consistent with the generic "engineering analysis" in item 4 (now item 5).

The scope of ASTM E2032 (including boiler plate sections) reads as follows:

1. Scope

1.1 This practice covers the extension of fire resistance ratings obtained from fire tests performed in accordance with Test Method E119 to constructions that have not been tested. Test Method E119 evaluates the duration for which test specimens will contain a fire, retain their standard integrity, or both during a predetermined test exposure.

1.2 This practice is based on principles involving the extension of test data using simple considerations. The acceptance of these principles and their application is based substantially on an analogous worst case proposition.

1.3 These principles are only applicable to temperature conditions represented by the standard time-temperature curve described in Test Method E119. Test Method E119 is a fire-test-response standard.

1.4 The types of building constructions which are the subject of this practice are categorized as follows: beams; floor and roof assemblies; columns; and walls and partitions. Floor and roof assemblies include such assemblies with ceiling protective membranes.

1.5 The extension of test data using numerical calculations based on empirical data or theoretical models is not covered in this practice.

1.6 This practice does not cover the substitution of one proprietary material for another proprietary material, or materials for which fire test data are not presently available.

1.7 This practice does not purport to be comprehensive in its treatment of non-proprietary modifications of tested constructions. Engineering evaluation or tests are recommended for assessing modifications not specifically covered in this practice.

1.8 The values stated in SI units are to be regarded as standard. The values given in parentheses after SI units are provided for information only and are not considered standard.

1.9 This standard is used to determine certain fire-test responses of materials, products, or assemblies to heat and flame under controlled conditions by using results obtained from fire-test-response standards. The results obtained from using this standard do not by themselves constitute measures of fire hazard or fire risk.

1.10 This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety, health, and environmental practices and determine the applicability of regulatory limitations prior to use.

1.11 This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.

(The proposed new standard has been developed by ASTM as a consensus standard and will be provided to ICC and the committee by ASTM staff together with all the other newly proposed ASTM standards).

Cost Impact: The change proposal is editorial in nature or a clarification and has no cost impact on the cost of construction

Justification for no cost impact:

The proposal provides an additional (optional) method of calculating fire resistance ratings. No requirement is being added.

FS3-24

FS4-24

IBC: 703.3, 703.3.1

Proponents: Marcelo Hirschler, GBH International, GBH International (mmh@gbhint.com)

2024 International Building Code

703.3 Noncombustibility tests.
The tests indicated in Section 703.3.1 shall serve as criteria for acceptance of *building* materials as set forth in Sections 602.2, 602.3 and 602.4 in Types I, II, III and IV construction. The term “noncombustible” 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.

Revise as follows:

703.3.1 Noncombustible materials.
Materials required to be noncombustible shall be tested in accordance with ASTM E136 and pass the test. Alternately, materials required to be noncombustible shall be tested in accordance with ASTM E2652 using the acceptance criteria prescribed by ASTM E136.

Exception: Materials having a structural base of noncombustible material as determined in accordance with ASTM E136, or with ASTM E2652 using the acceptance criteria prescribed by ASTM E136, with a surfacing of not more than 0.125 inch (3.18 mm) in thickness having a *flame spread index* not greater than 50 when tested in accordance with ASTM E84 or UL 723 shall be acceptable as noncombustible.

Reason: The section implicitly states that a noncombustible materials needs to pass ASTM E136 but it does not explicitly state it. The danger, unless corrected, is that someone might suggest that simply conducting an ASTM E136 test and failing is acceptable: it is not. Note that the reference to the alternate test (ASTM E2652) specifically says that the material needs to pass the test with the acceptance criteria of ASTM E136.

A proposal has been submitted (by FCAC) to revise the IWUIC and to include the exact same language from the proposed revised 703.3.1, meaning that it includes the added words "and pass the test". Optional slightly modified language for the IBC is likely to be proposed and would also be suitable, but consistent language between the IBC and IWUIC would be helpful.

Also, FCAC is also submitting a proposal to the IFC to refer to IBC section 703.3.1 for the requirements of noncombustible materials, so consistency is important.

There may be one or more proposals with alternate revised language for section 703.3.1, with the same objective of ensuring that the section explicitly states that the material is noncombustible only if it has passed the ASTM E136 test. I suggest that, if other proposals are submitted, they should be heard together and the committee can then decide.

Cost Impact: The change proposal is editorial in nature or a clarification and has no cost impact on the cost of construction

Justification for no cost impact:

This is simply clarification of what was always intended.

FS5-24

IBC: 703.3.1

Proponents: Tim Earl, GBH International, Self (tearl@gbhint.com)

2024 International Building Code

Revise as follows:

703.3.1 Noncombustible materials.

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

Exception: Materials having a structural base of noncombustible material as determined in accordance with ASTM E136, or with ASTM E2652 using the acceptance criteria prescribed by ASTM E136, with a surfacing of not more than 0.125 inch (3.18 mm) in thickness having a *flame spread index* not greater than 50 when tested in accordance with ASTM E84 or UL 723 shall be acceptable as noncombustible.

Reason: This section is unintentionally ambiguous, as it states that materials must be tested to ASTM E136 or E2652 but says nothing about the required result. This proposal clarifies the intent.

Cost Impact: The change proposal is editorial in nature or a clarification and has no cost impact on the cost of construction

Justification for no cost impact:

Clarification of the intent of the code with no technical change.

FS6-24

IBC: 703.3.1, 703.3.2 (New)

Proponents: Shamim Rashid-Sumar, National Ready Mixed Concrete Association, National Ready Mixed Concrete Association (ssumar@nrmca.org); Darryl Dixon, National Ready Mixed Concrete Association, National Ready Mixed Concrete Association (ddixon@nrmca.org)

2024 International Building Code

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

Exception: Materials having a structural base of noncombustible material as determined in accordance with ASTM E136, or with ASTM E2652 using the acceptance criteria prescribed by ASTM E136, with a surfacing of not more than 0.125 inch (3.18 mm) in thickness having a *flame spread index* not greater than 50 when tested in accordance with ASTM E84 or UL 723 shall be acceptable as noncombustible.

Add new text as follows:

703.3.2 Inherently noncombustible materials. Inherently noncombustible materials, such as concrete and steel, shall not be required to be tested to be acceptable as noncombustible materials.

Reason: This code change provides a clarification to IBC Section 703.3.1, which requires that materials required to be noncombustible be tested in accordance with ASTM E136 or ASTM E2652. However, the testing requirements should not apply to clearly noncombustible materials such as concrete, masonry or steel.

The proposed text provides necessary clarification indicating that such materials are not required to be tested.

Cost Impact: The change proposal is editorial in nature or a clarification and has no cost impact on the cost of construction

Justification for no cost impact:

This code change provides an editorial clarification to the previous code section and will not increase or decrease the cost of construction.

FS7-24

IBC: 703.7

Proponents: Edward Lisinski, American Wood Council (elisinski@awc.org)

2024 International Building Code

Revise as follows:

703.7 Sealing of adjacent mass timber elements.
In *buildings* of Types IV-A, IV-B and IV-C construction, where a *fire-resistant joint system* is not required at abutting *joints* or intersections in accordance with Section 715, ~~sealant or adhesive~~ sealants meeting the requirements of ASTM C920 or adhesives meeting the requirements of ASTM D3498 shall be provided to resist the passage of air ~~in~~ at the following locations:

1. ~~At abutting~~ Abutting edges and intersections of *mass timber building elements* required to be fire-resistance rated.
2. ~~At abutting~~ 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~~ Exceptions: Sealants or adhesives need not be provided ~~where they are not a required component of a tested fire-resistance-rated assembly~~ where any of the following apply:

1. The abutting edges or intersections were tested without sealants or adhesives as part of a *fire-resistance-rated* assembly.
2. The abutting edges or intersections occur entirely within a single *dwelling unit* or *fire area* in the same *story*.
3. Draftstopping material in accordance with Section 718.3.1 is installed on the unexposed side of the abutting edges or intersections.

Reason: With the addition of Types IV-A, IV-B, and IV-C construction to the code, a prescriptive requirement for sealing the abutting edges and intersections of fire-resistance-rated mass timber elements was adopted to reduce the likelihood of flames and hot gasses passing between mass timber elements to adjacent fire areas. The requirement for use of adhesives or sealants was prescribed based on details from compartment fire testing, where adhesives or sealants were used at the intersections of mass timber panels. However, the existing code language has been misapplied to require sealants or adhesives between mass timber assemblies that already require a fire-resistant joint system and between mass timber elements that aren't required to perform a fire separation function, such as the bearing of a beam on a column or a mass timber panel on a beam. In addition, other alternatives exist to resist air movement between mass timber elements where fire separation is required. This change addresses these issues.

- The first sentence of Section 703.7 is modified to clarify that Section 703.7 only applies where a fire-resistant joint system is not required, since a fire-resistant joint system would serve the intended purpose of the sealant or adhesive required by Section 703.7, and the inclusion of additional sealants or adhesives might compromise the fire-resistant joint system.
- Exception #1 is modified to clarify that it only applies to abutting edges or intersections that were tested without sealants or adhesives as part of the fire-resistance-rated assembly.
- Exception #2 acknowledges that it is not necessary to prevent passage of air from one side of a building element to the other if both sides of the building element are within the same dwelling unit or fire area.
- Exception #3 is added to recognize that in lieu of using sealant or adhesive, draftstopping material can be installed on the unexposed side to prevent passage of air through the abutting edges or intersections.

Cost Impact: Decrease

Estimated Immediate Cost Impact:

This code change proposal will decrease the cost of construction by approximately $50 per tube of sealant or adhesive for each tube not used due to Exception 2 or 3.

Estimated Immediate Cost Impact Justification (methodology and variables):

The proposal incorporates exceptions to the use of prescribed sealants or adhesives for conditions where such requirements are unnecessary. There will be both material (approximately $15 per tube of sealant or adhesive) and labor (approximately $35 of labor costs to install each tube) cost savings by reducing the locations where sealants or adhesives are installed.

FS7-24

FS8-24

IBC: 704.5

Proponents: Omar Al-Mansouri, CSTB, France, Centre Scientifique et Technique du Bâtiment (omar.almansouri@cstb.fr)

2024 International Building Code

Revise as follows:

704.5 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. This provision is intended to limit the transfer of heat to the structural element from the connection elements by requiring the connection element to be protected with a minimum of 1 inch (25 mm) of some form of fire-resistance protection. This code provision shall not be interpreted as an exception from the verification of the fire resistance of attachments to structural members. Attachments to structural members shall be assessed for their fire resistance in accordance with a recognized standard.

Reason: The way this code provision is written may leave room for interpretation that by applying 1 in. (25 mm) of fire protection around attachments, they do not need to be verified for fire resistance (regardless of the used fire protection material). The existing language is creating controversy in ACI committees 355 (Anchorage to Concrete) and 216 (Fire). The following is an explanation of why this provision needs to be clarified to avoid misuse of code language.

Attachments to structural members undergo a degradation of their mechanical resistance at high temperature and may fail prematurely before the collapse of the structural member under fire conditions despite the applied fire protection.

The fire resistance of attachments shall be considered even when fire protection is applied. Eurocode 3, Part 1-2, and Eurocode 2, Part 4, have provisions dealing with fire resistance of steel-to-steel attachments and steel-to-concrete attachments. Recent developments in the literature have shown that the temperature of attachments keeps on increasing despite the application of fire protection (see the PhD of Omar Al-Mansouri, 2020). The temperature of the attachment can reach levels at which the mechanical resistance can no longer withstand the applied load resulting in a premature failure of the attachment ensuring the support conditions of the structural member.

An attachment is always designed for a fire rating equal to or higher than that of the structural member. Premature failure of the attachment due to temperature increase presents a safety risk.

Bibliography: EN 1993-1-2:2005, Design of steel structures – Part 1-2: General rules – Structural fire design.

EN 1992-4:2018, Design of concrete structures – Part 4: Design of fastenings for use in concrete.

Al-Mansouri, O [Ph.D thesis]. Behavior of bonded anchors in concrete under fire. Civil Engineering. Ecole nationale supérieure Mines-Télécom Lille Douai, 2020. English. (NNT: 2020MTLD0011).

Cost Impact: The change proposal is editorial in nature or a clarification and has no cost impact on the cost of construction

Justification for no cost impact:

This code proposal clarifies the scope of application of this specific provision to avoid misuse of the code language.

FS9-24

IBC: 704.5 (New), 704.5, 704.5.1, 704.5.2 (New), AWC Chapter 35 (New)

Proponents: Edward Lisinski, American Wood Council (elisinski@awc.org)

2024 International Building Code

Add new text as follows:

704.5 Protection of Connections and Attachments. Connections and attachments to structural members that are required to have a fire-resistance rating shall be protected in accordance with 704.5.1 and 704.5.2.

Revise as follows:

~~704.5~~ 704.5.1 Attachments to structural steel members.
The edges of lugs, brackets, rivets and bolt heads attached to structural steel members shall be permitted to extend to within 1 inch (25 mm) of the surface of the fire protection.

~~704.5.1~~ 704.5.1.1 Secondary attachments to structural steel members.
Where primary and secondary structural steel members require fire protection, any additional structural steel members having direct connection to the *primary structural frame* or *secondary structural members* shall be protected with the same fire-resistive material and thickness as required for the structural member. The protection shall extend away from the structural member a distance of not less than 12 inches (305 mm), or shall be applied to the entire length where the attachment is less than 12 inches (305 mm) long. Where an attachment is hollow and the ends are open, the fire-resistive material and thickness shall be applied to both exterior and interior of the hollow steel attachment.

Add new text as follows:

704.5.2 Connections to structural wood members.
Where a structural wood member is required to have a *fire-resistance rating*, structural connections to that member shall be protected from fire exposure for the time corresponding to the required *fire-resistance rating* of the member. Protection time shall be determined by one of the following:

1. Testing in accordance with Section 703.2.1 where the connection is part of the fire-resistance test.
2. Engineering analysis that demonstrates that the temperature rise at any portion of the connection is limited to an average temperature rise of 250°F (139°C), and a maximum temperature rise of 325°F (181°C), for a time corresponding to the required *fire-resistance rating* of the structural element being connected. For the purposes of this analysis, the connection includes connectors, fasteners and portions of wood members included in the structural design of the connection.
3. Engineering analysis in accordance with ANSI/AWC FDS.

Add new standard(s) as follows:

AWC

American Wood Council
222 Catoctin Circle SE, Suite 201
Leesburg, VA 20175

ANSI/AWC FDS-2024: Fire Design Specification (FDS) for Wood Construction

Staff Analysis: A review of the standard proposed for inclusion in the code, ANSI/AWC FDS-2024 Fire Design Specification (FDS) for Wood Construction, with regard to some of the key ICC criteria for referenced standards (Section 4.6 of CP#28) will be posted on the ICC website on or before March 18, 2024.

Reason: The intent of this proposal is to:

1. Relocate criteria for the protection of connections between structural wood members from Chapter 23 to Chapter 7, alongside

related criteria for structural steel connections and attachments.

2. Extend the requirements that currently apply specifically to connections in Types IV-A, IV-B, and IV-C construction to connections between fire-resistance-rated structural wood members in general.
3. Add a reference to ANSI/AWC *2024 Fire Design Specification (FDS) for Wood Construction*, which provides a design methodology for protecting connections with wood and/or gypsum, where protection times are assigned based on the temperature rise limitations established in ASTM E119 testing and Item #2 of existing Section 2304.10.1. The FDS was developed as an American National Standard through the AWC ANSI-approved consensus standards development process, and is available on the AWC website at the following location: https://awc.org/wp-content/uploads/2023/11/AWC_FDS2024_20231103_AWCWEBSITE.pdf
4. Clarify in the charging paragraph that connections must be protected for the time associated with the members being connected.

If this proposal is successful, the intention is to remove Section 2304.10.1 in the Group B code development process so there are not duplicative requirements in the code.

Bibliography: ANSI/AWC 2024 Fire Design Specification (FDS) for Wood Construction. View this document online: https://awc.org/wp-content/uploads/2023/11/AWC_FDS2024_20231103_AWCWEBSITE.pdf.

Cost Impact: Decrease

Estimated Immediate Cost Impact:

$0

Estimated Immediate Cost Impact Justification (methodology and variables):

This proposal relocates a code section from Chapter 23 into a more proper location in Chapter 7. However, it does allow for this section to be available for design of wood members in other types of construction besides Type IV. It provides additional options for compliance with existing connection protection requirements specified in IBC 704.2 and IBC 704.3 without removing any of the existing options for demonstrating compliance. The inclusion of these additional options does not in and of itself increase or decrease the overall cost impact of the code, because these options may not be chosen. The existing options are still relevant, and if chosen, have no cost impact on the actual code requirements.

FS9-24

FS10-24

IBC: 704.5.1

Proponents: Richard Walke, Creative Technology Inc. and CM Services, National Fireproofing Contractors Association (richwalke61@gmail.com)

2024 International Building Code

Revise as follows:

704.5.1 Secondary attachments to structural members.
Where primary and secondary structural steel members require fire protection, any additional ~~structural~~ steel members having direct connection to the *primary structural frame* or *secondary structural member*, *and* having a cumulative unprotected footprint greater than 4.65 square inches (3,000 mm^2) per 3 linear feet or per linear meter of primary or secondary steel, shall be protected with the same fire-resistive material and thickness as required for the structural member. The protection shall extend away from the structural member a distance of not less than ~~12~~18 inches (~~305~~457 mm), or shall be applied to the entire length where the attachment is less than ~~12~~18 inches (~~305~~457 mm) long. Where an attachment is hollow and the ends are open, the fire-resistive material and thickness shall be applied to both exterior and interior of the hollow steel attachment.

Reason: Section 704.6.1 of the 2021 IBC was establish based on a Proposal FS8-18 submitted by the California State Fire Marshal's Office. We supported the original intent of the proposal which was to protect secondary non-structural tubular steel attachments. However, during the code development process, the scope of the proposal changed significantly. In the end this section required protection of all "secondary steel attachments" to primary and second structural steel members.

But what is a "secondary steel attachment"? Members of the National Fireproofing Contactors Association (NFCA) have reported code officials are asking for anything and everything attached to the primary and second structural steel members be protected, including sometimes, the tie wires which support acoustical ceilings. That clearly was not the intent of the original proposal.

Section 704.6.1 was updated in the 2024 IBC as a result of Proposal FS11-21 submitted by National Fireproofing Contractors Association (NFCA) with help from the American Iron and Steel Institute. The focus of the changes was to limited the application of the section to structural members having direct connection to the primary structural frame or secondary structural members. Without having hard data to support a more surgical approach to what attachments truly impact the fire performance of the primary and second structural steel members, we believe this was a reasonable compromise.

After further research, we found guidance on the protection of attachments in a UL Solutions United Kingdom document. The 4.65 square inches (3,000 mm^2) per 3 linear feet or per linear meter of structural element length limitation included in this proposal is based on recommendation from *UL Solutions' guide to steelwork fire protection*. The same limitation is also stated in several other international documents relating to fireproofing, including:

1. The Fire and Blast Information Group (FABIG) Technical Note 11, entitled, *Fire Loading and Structural Response*.
2. International Coating's *Intertherm 750 Application Manual*.

Cost Impact: Increase

Estimated Immediate Cost Impact:

Based on industry and manufacturer input, the average cost of protecting an intermediate size attachment for a distance of 18 in. from the primary or secondary steel is approximately $1 to $2.

Estimated Immediate Cost Impact Justification (methodology and variables):

This includes materials and labor costs for protecting a typical attachment for a distance of 18 in. The total cost in any given building will depend upon the number of attachments which will ultimately require protection.

FS11-24

IBC: 704.9

Proponents: David Renn, PE, SE, City and County of Denver, Colorado Chapter Code Development Committee (david.renn@denvergov.org)

2024 International Building Code

Revise as follows:

704.9 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 705.5 for *exterior walls* based on the *fire separation distance*. For the purpose of this item only, where load-bearing structural members are located on the outside of a *building* or *structure*, *fire separation distance* shall be measured to the load-bearing structural members.

Reason: Section 704.9 deals with the fire-resistance rating (FRR) of load-bearing structural members that are either located within the exterior wall or outside of a building or structure, and Item 3 requires a FRR based on fire separation distance (FSD). Per definition in Chapter 2, FSD is measured from the "building face". Where a structural member is located within an exterior wall, it is clear that FSD for Item 3 is measured from the exterior wall, which would be the "building face". However, it is not clear where to measure FSD from where the structural member is outside the building, since FSD is measured to the "building face".

For example, per Table 705.5 an exterior wall of a Type IIB or VB building typically can have a 0-hour FRR for FSD greater than or equal to 10' and is required to have a 1-hour FRR when FSD is less than 10'. So, if an exterior wall has 12' FSD and structural members outside the exterior wall are located at 8' from a lot line, what FRR is required for the structural members to comply with Item 3? Since the exterior wall FRR requirements are partially intended to protect a building and its structural members from a fire on an adjacent lot, it is believed the intent of Item 3 is to measure the FSD to the structural members in question, not the "building face" at the exterior wall. For this case, this results in a 1-hour FRR for the structural members and a 0-hour FRR for the exterior wall. To clarify this intent, this proposal adds a requirement that FSD for such members be measured to the structural member, since this is not covered in the definition of FSD. Since the FRR and opening limitations of the exterior wall would be based on FSD measured from the exterior wall, the new language indicates that the FSD to the structural members is for the purpose of this item only.

Cost Impact: The change proposal is editorial in nature or a clarification and has no cost impact on the cost of construction

Justification for no cost impact:

This proposal is intended to clarify the intent of the code only, so it has no cost impact.

FS12-24

IBC: 705.2.1, 705.2.2, 705.2.3.1, 705.2.4

Proponents: Julius Carreon, City of Bellevue, Washington Association of Building Officials Technical Code Development Committee (jcarreon@bellevuewa.gov); Quyen Thai, City of Tacoma, Washington Association of Building Officials Technical Code Development Committee (qthai@cityoftacoma.org); Micah Chappell, Seattle Department of Construction and Inspections, Washington Association of Building Officials Technical Code Development Committee (micah.chappell@seattle.gov)

2024 International Building Code

Revise as follows:

705.2.1 Types I and II construction.
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 and 705.2.5.

705.2.2 Type III, IV or V construction.
Projections from walls of Type III, IV or V construction shall be of any *approved* material. Balconies and similar projections of combustible construction shall comply with Section 705.2.4.

~~705.2.3.1~~705.2.4 Combustible 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 on *buildings* of Types III, IV-HT and V construction shall be permitted to be of Type V construction and shall not be required to have a *fire-resistance rating* where sprinkler protection is extended to these areas.
4. Where sprinkler protection is extended to the balcony areas, the aggregate length of the balcony on each floor shall not be limited.

~~705.2.4~~705.2.5 Bay and oriel windows.
Bay and oriel windows constructed of combustible materials shall conform to the type of construction required for the *building* to which they are attached.

Exception: *Fire-retardant-treated wood* shall be permitted on *buildings* three *stories* or less above *grade plane* of Type I, II, III or IV construction.

Reason: This code change is to undo the inadvertent substantive change when the section of the code was moved from Section 1406.3 to Section 705.2.3.1 between 2015 and 2018 code (See FS15-15: http://media.iccsafe.org/codes/2015-2017/GroupA/PCH/IBC-Fire-Safety.pdf).

Based on FS15-15 code change (reasoning is just relocation of the Section and no intended change) and old 2015 IBC Section 1406.3, Section 705.2.3.1 should be applied independently from Section 705.2.3. Section 705.2.3 applies anytime your projection has an fire separation distance of less than 5 feet, and Section 705.2.3.1 applies anytime your projection is of "combustible construction other than fire-retardant-treated wood. However, because of the logic of applying the code sections based on hierarchy, users could interpret the "combustible construction requirements" (705.2.3.1) will only apply when fire separation distance is 5-feet or less. This proposal is intended to correct this by moving 705.2.3.1 into a separate section from 705.2.3 and clarify, by adding a pointer in Section 705.2.2, that

combustible construction requirements for balconies and similar projections should apply to all construction types.

Section Numbering Coordination:

With the renumbering of Section 705.2.3.1 to 705.2.4, this proposal contains the section renumbering necessary in 705.2. However, correlating changes will also need to be made to revise "705.2.3.1" to "705.2.4" in the following sections in the IBC:

- Section 603.1, Items 13 and 19
- Section 705.2.1
- Section 705.2.3, Item 5
- Chapter 35 (ASTM D7032)

In addition, the same change would be required to be made in IFC Section 903.3.1.2.1, which would then translate over to IBC Section 903.3.1.2.1.

WABO TCD has submitted a separate code change proposal to revise Sections 705.2.2 and 705.2.3.1 to address Types IV-A/B/C construction. It is our intent that in the event that both proposals are approved, this renumbering would govern over the section numbering shown in the other proposal.

Cost Impact: The change proposal is editorial in nature or a clarification and has no cost impact on the cost of construction

Justification for no cost impact:

The code change proposal will not increase or decrease the cost of construction. See also the Reason Statement.

FS12-24

FS13-24

IBC: 705.2.2, 705.2.3.1

Proponents: Julius Carreon, City of Bellevue, Washington Association of Building Officials Technical Code Development Committee (jcarreon@bellevuewa.gov); Quyen Thai, City of Tacoma, Washington Association of Building Officials Technical Code Development Committee (qthai@cityoftacoma.org); Micah Chappell, Seattle Department of Construction and Inspections, Washington Association of Building Officials Technical Code Development Committee (micah.chappell@seattle.gov)

2024 International Building Code

Revise as follows:

705.2.2 Type III, IV or V construction.
Projections from walls of Type III, IV or V construction shall be of any *approved* material. Balconies and similar projections of combustible construction shall comply with Section 705.2.3.1.

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. *Fire-retardant-treated wood* shall not be permitted for balconies and similar projections on buildings of Type IV-A, IV-B, or IV-C construction. 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 on *buildings* of Types III, IV-HT and V construction shall be permitted to be of Type V construction and shall not be required to have a *fire-resistance rating* where sprinkler protection is extended to these areas.
4. Where sprinkler protection is extended to the balcony areas, the aggregate length of the balcony on each floor shall not be limited.
5. On buildings of Types IV-A or IV-B construction three stories or less above grade plane, and Type IV-C construction not classified as *high-rise*, non-fire-resistance rated heavy timber building elements shall be permitted for balconies, porches, decks and exterior stairways not used as required exits.

Reason: This code change proposal is intended to clarify the requirements for combustible projections of Type III, IV or V construction in Section 705.2.2 and provides a new/separate exception for combustible projections of Types IV-A, IV-B and IV-C construction, three new construction types added in 2021 code cycle.

For projections of Type III, IV or V construction, the current construction requirements are not clear since Section 705.2.2 simply indicates the construction shall be of any "approved" material. What does an “approved” material mean, particularly when the construction material is combustible, and the type of construction requires fire protection such as for type III-A, IV-A, IV-B, IV-C and V-A? Section 705.2.3.1 provides the requirements when combustible materials are used but there is no direct code path to the section, since it is located as a subsection of 705.2.3 that applies only if the balcony/projection has fire separation distance (FSD) of less than 5-ft.

In addition, the 2021 IBC added three new construction types—IV-A, IV-B and IV-C—that allow the use of mass timber in buildings up to 18, 12 and nine stories. These new types are based on the previous Heavy Timber construction type (renamed Type IV-HT) but with additional fire-resistance ratings and levels of required noncombustible protection, to match the level of performance of Types I and II construction. It is not clear whether the additional fire-resistance ratings and levels of required noncombustible protection will also need to be applied for balconies and similar projections on these new mass timber construction types. It is our understanding that the current construction requirements in IBC Section 705.2 (projections) is intended for the traditional IV construction type (now classified as Type IV-HT) and therefore not intended for high-rise buildings. The 2024 IBC has clarified exception #3 in 705.2.3.1, which permits the

use of type V construction where sprinkler protection is provided, is limited to IV-HT but silent on IV-A, IV-B and IV-C. Hence, depending how the designer and code official interpret what is considered "approved" material in 705.2.2, the projection construction for these new types of construction could be conservative (i.e., all projections need the additional fire resistance rating and non-combustible protection per Table 601) or non-conservative (i.e., use type V, FRT, or exposed/non-rated heavy timber on 18 story high rise).

To address the ambiguity of the code language in Section 705.2.2 and the requirements for combustible projections on the new types of mass timber construction, we are proposing the following:

- Add a pointer on Section 705.2.2 to address combustible projection requirements on fire resistance rated construction types such as Types III-A, IV-A, V-A and new mass timber construction types IV-A/B/C. WABO TCD has also submitted a separate code change proposal that renumbers Section 705.2.3.1 to Section 705.2.4, to clarify and undo the inadvertent substantive change when the section of the code was moved from Section 1406.3 to Section 705.2.3.1 between 2015 and 2018 code (See FS15-15: http://media.iccsafe.org/codes/2015-2017/GroupA/PCH/IBC-Fire-Safety.pdf). Based on the reason statement for FS15-15 and its previous location in 2015 code, Section 705.2.3.1 should be applied independently from Section 705.2.3, which means it should not be constrained by fire separation distance requirements. By adding a pointer on Section 705.2.2, it makes it clear that where fire resistance rating is required by Table 601 for floor construction (i.e., Types III-A, IV-A, V-A and IV-A/B/C), any combustible projection construction will need to comply with 705.2.3.1 regardless if the projection is beyond the 5 feet separation distance trigger in Section 705.2.3. If both proposals are approved, our intent is that the other proposal (renumbering the section) would govern for both Section 705.2.3.1 and the pointer in Section 705.2.2.
- Add a clarifying prohibition and an exception in 705.2.3.1, to deal with combustible projections on Type IV-A, IV-B and IV-C construction.
    - Consistent with the intent of the original proponents of the proposal to introduce Types IV-A, IV-B, and IV-C into the code, fire-retardant treated wood is prohibited in those types of construction. This only affects stick-framed FRT wood, since FRT mass timber does not exist.
    - However, the exception will permit the use of (exposed) non-rated heavy timber construction on buildings of Types IV-A or IV-B construction three stories or less above grade plane, and Type IV-C construction not classified as high rise. This implies that combustible balconies and similar projections on Type IV-A and Type IV-B buildings more than 3-stories and Type IV-C buildings classified as high rise shall meet the type of construction in accordance with Table 601. We understand the fire performance requirements on Types IV-A and IV-B construction were developed based on Type I and Type II construction, hence, the proposed 3-stories cut-off for the exception on Type IV-A and Type IV-B is intended to align with the exception for Type I and Type II (705.2.3.1 exception 1). For Type IV-C, we are proposing a non-high rise cut-off to align with traditional Type IV-HT construction, which does not require fire rated construction (and both Type IV-C and Type IV-HT have 85 feet maximum building height limit).
    - WABO TCD sent a draft of the proposal to AWC and one comment that we received from them is that their preferred terminology was "heavy timber building elements," as opposed to "heavy timber construction" currently use in the IBC. The "heavy timber construction" terminology occurs in (9) other locations in the IBC but we have not proposed to change those in this proposal. If the committee agrees on replacing the terminology with "heavy timber building elements", we can submit an editorial change in the second CAH.

Cost Impact: The change proposal is editorial in nature or a clarification and has no cost impact on the cost of construction

Justification for no cost impact:

As noted in the reason statement of the proposal, the construction requirements for combustible balconies and similar projections on the three construction Types IV-A, IV-B and IV-C is currently very ambiguous. Depending how the designer and code official interpret what is considered "approved" material in the current code will determine if this code change proposal will increase or decrease the cost of construction. In general, construction for Types IV-A/B buildings 3-stories or less and Type IV-C buildings that aren't high rises may see a small decrease in cost as this code proposal makes it clear that exposed/non-rated heavy timber is permitted, as opposed to fire-resistance rated mass timber.

Recognizing that the choice of materials used in construction is an option, in jurisdictions where designers and code officials have allowed non-fire-resistance rated heavy timber for these balconies/projections, construction cost for Types IV-A/B buildings that are more than 3-stories and Type IV-C high rise buildings may see a small increase in cost as this code proposal implies the balconies/projection construction for these buildings will need additional fire resistance rating protection per Table 601. Data on the increase in cost is not readily available to people who aren't professional estimators, but a 2022 online article (https://www.checkatrade.com/blog/cost-guides/cross-laminated-timber-cost/) estimates adding fire protection and soundproofing to cross-laminated timber costs approximately $3 to $7 per square foot. We assume the cost increase will

be in this ballpark.

We do not consider the prohibition on FRT wood to be a cost increase since no amount of stick framing should have been allowed in these types of construction.

FS13-24

FS14-24

IBC: 705.6, 705.6.1 (New)

Proponents: Edward Lisinski, American Wood Council (elisinski@awc.org)

2024 International Building Code

Delete and substitute 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 sheathing, roof sheathing, deck or slab above.~~
2. ~~The underside of a floor/ceiling or roof/ceiling assembly having a *fire-resistance rating* equal to or greater than the *exterior wall* and the *fire separation distance* is greater than 10 feet.~~

~~Parapets shall be provided as required by Section 705.12.~~

705.6 Continuity. The continuity of the *fire-resistance rating* shall extend from the top of the foundation to the top of the parapet. If a parapet is not required by Section 705.12, the *fire-resistance rating* shall extend to the underside of the roof sheathing, deck or slab.

Add new text as follows:

705.6.1 Supporting Construction. Where a floor or roof assembly supports an *exterior wall* or parapet above, the portion of the floor or roof assembly that supports the *exterior wall* or parapet shall have a *fire-resistance rating* of not less than the *fire-resistance rating* required for the *exterior wall* or parapet.

Reason: The proposed revision coordinates with existing requirements for fire-resistance rating (FRR) continuity for all types of supporting construction. Existing language, added in 2024 code development cycle (FS18-21), has caused confusion in application to platform construction because walls in platform construction are not continuous from foundation to roof. In platform construction, FRR continuity must be maintained through portions of floor or roof elements supporting the wall or parapet above, however, the wall itself is not continuous. The proposed revisions clarify that FRR continuity is to be maintained to the top of the parapet or to the underside of the roof deck where a parapet is not required. By clarifying the concept of FRR continuity versus continuity of the exterior wall, the intent of Item 2 in existing language is addressed more broadly and no longer necessary in the code.

Cost Impact: The change proposal is editorial in nature or a clarification and has no cost impact on the cost of construction

Justification for no cost impact:

This proposal clarifies that the important aspect of fire protection is the continuity of the fire-resistance as required in IBC 705.7.1, and not the continuity of the exterior wall itself.

FS15-24

IBC: 705.7.1

Proponents: Edward Lisinski, American Wood Council (elisinski@awc.org)

2024 International Building Code

Revise as follows:

705.7.1 Floor assemblies supporting exterior walls in Type III, IV and V construction.
In Type III, IV and V construction where a floor assembly supports gravity loads from an *exterior wall*, the *fire-resistance rating* of the portion of the floor assembly that supports the *exterior wall* shall be not less than the *fire-resistance rating* required for the *exterior wall* in Table 601. The *fire-resistance rating* provided by the portion of the floor assembly supporting and within the plane of the *exterior wall* shall be permitted to include the contribution of the ceiling membrane when considering exposure to fire from the inside. Where a floor assembly supports gravity loads from an *exterior wall*, the *building elements* of the floor construction within the plane of the *exterior wall*, including but not limited to rim joists, rim boards and blocking, shall be in accordance with the requirements for interior *building elements* of ~~Type III~~ the applicable type of construction.

Reason: Existing Section 705.7.1 was added by change proposal FS19-21 to address continuity of fire-resistance rating for exterior walls of Type III platform construction. These same structural stability requirements that are appliable to Type III construction are equally applicable to Type IV and V construction where platform construction is used.

The AWC *Design for Code Acceptance No. 3 (DCA 3)* document has design details to maintain the required fire resistance of the wall for fire exposure from the interior of the building, and, when required by IBC Section 705.5, for exposure from the exterior as well. Examples of these details can be found in the AWC DCA 3 document (a link has been provided in the bibliography section below). A ceiling membrane may or may not be present, but as shown in the existing language of Section 705.7.1 and the AWC DCA 3, it is an appropriate design assumption to consider its contribution when the fire rating of the floor assembly supporting the exterior wall is to be based on fire exposure from the interior of the building. This situation could occur in Type IV and V construction as well and the building elements will respond the same way in a fire, so those construction types should be included in this code section.

AWC has a separate change proposal to Section 705.6 to provide general language that supports the concept of continuity of fire-resistance rating applicable when exterior walls are continuous, and when floors intersect the exterior wall in typical platform construction.

Bibliography: American Wood Council *Design for Code Acceptance No. 3.* View this document online: https://awc.org/wp-content/uploads/2021/12/awc-dca3_20210209_awcwebsite.pdf

Cost Impact: The change proposal is editorial in nature or a clarification and has no cost impact on the cost of construction

Justification for no cost impact:

This proposal provides clarification of the applicability of existing code requirements for platform construction.

FS16-24

IBC: 705.7.1, 705.8 (New)

Proponents: David Renn, PE, SE, City and County of Denver, Colorado Chapter Code Development Committee (david.renn@denvergov.org)

2024 International Building Code

Revise as follows:

~~705.7.1~~ 705.8.1 **Floor assemblies in Type III construction.**
In Type III construction where a floor assembly supports gravity loads from an *exterior wall*, the~~*fire-resistance rating* of the portion of the floor assembly that supports the *exterior wall* shall be not less than the *fire-resistance rating* required for the *exterior wall* in Table 601. The~~*fire-resistance rating* provided by the portion of the floor assembly supporting and within the plane of the *exterior wall* shall be permitted to include the contribution of the ceiling membrane when considering exposure to fire from the inside. Where a floor assembly supports gravity loads from an *exterior wall*, the *building elements* of the floor construction within the plane of the *exterior wall*, including but not limited to rim joists, rim boards and blocking, shall be in accordance with the requirements for interior *building elements* of Type III construction.

Add new text as follows:

705.8 Supporting construction. The supporting construction for an exterior wall shall have a fire-resistance rating as required by Section 704.1.1.

Reason: Currently, there is no specific requirement in Section 705 for supporting construction of exterior walls. However, such supporting construction must still meet the requirement of 704.1.1 that "The fire-resistance ratings of supporting structural members and assemblies shall be not less than the ratings required for the fire-resistance-rated assemblies supported by the structural members." The fire-resistance rating continuity requirements in 705.6 and the structural stability requirements of 705.7 essentially require supporting construction within the plane of an exterior wall to have the same fire-resistance rating as the wall supported. However, there are often cases where a fire-resistance rated exterior curtain wall is supported by a floor or beam that is inside the exterior wall, which is not covered by these sections. Also, where exterior walls step back at an upper floor, the exterior wall is supported on a floor or beam below the wall. For these cases, 704.1.1 currently requires the supporting construction to have a fire-resistance rating not less than the wall supported, but this is often missed by designers.

As an example, a 5-story Type III building could have a set-back exterior wall at the 5th story that is a bearing wall for the roof, and this wall requires a 2-hour fire-resistance rating per Table 601. Designers often miss that the floor or beam supporting this wall at Level 5 also needs to have a 2-hour fire-resistance rating, as well as all supporting construction below this floor or beam down to the foundation. When this is discovered in plan review, there are significant changes needed to the drawings to meet the requirements. This proposal is intended to avoid this by providing a direct reference to 704.1.1 in a new supporting construction section, 705.8, which will located after 705.7 that includes structural stability requirements for lateral bracing of the wall.

Current Section 705.7.1 for floor assemblies in Type III construction is relocated to be a subsection to the new supporting construction section since it addresses supporting construction requirements directly. Some wording in this section is proposed to be deleted since it is redundant with the new 705.8 section.

Cost Impact: The change proposal is editorial in nature or a clarification and has no cost impact on the cost of construction

Justification for no cost impact:

This proposal is a clarification with a pointer to an existing requirement, so there is no cost impact.

FS17-24

IBC: 705.7.2 (New)

Proponents: Edward Lisinski, American Wood Council (elisinski@awc.org)

2024 International Building Code

Add new text as follows:

705.7.2 Roof assemblies supporting parapets in Type III, IV and V construction. In Type III, IV and V construction where a roof assembly supports gravity loads from a parapet, the *fire-resistance rating* of the portion of the roof assembly that supports the parapet shall be not less than the *fire-resistance rating* required for the parapet in Section 705.12. The *fire-resistance rating* provided by the portion of the roof assembly supporting the parapet shall be permitted to include the contribution of the ceiling membrane when considering exposure to fire from the inside. Where a roof assembly supports gravity loads from a parapet, the *building elements* of the roof construction within the plane of the *exterior wall*, including but not limited to, rim joists, rim boards, and blocking, shall be in accordance with the requirements for roof assemblies of the applicable type of construction.

Reason: The proposed new section adds criteria that parallels Section 705.7.1, except that Section 705.7.1 is specific to floor assemblies supporting an exterior wall above. This change is necessary to clarify that the same criteria would also apply to a roof assembly supporting a parapet above. This is further necessary because parapet construction is addressed by the requirements of Section 705.12 and does not fall under the definition of exterior wall. The change clarifies that fire resistance is permitted to include the contribution of the ceiling membrane when considering exposure from the inside, just as it is for floor assemblies in platform construction.

AWC has a separate change proposal to Section 705.6 that provides general language in support of the concept of continuity of fire-resistance rating for roof assemblies supporting a parapet as it occurs in typical platform construction.

Cost Impact: The change proposal is editorial in nature or a clarification and has no cost impact on the cost of construction

Justification for no cost impact:

This code change proposal provides clarification that roof assemblies supporting a parapet above shall have the same criteria as floor assemblies supporting an exterior wall above.

FS17-24

FS18-24

IBC: 705.11 (New), 714.4 (New)

Proponents: Robert Marshall, FCAC, FCAC (fcac@iccsafe.org)

2024 International Building Code

Add new text as follows:

705.11 Penetrations. Penetrations into or through exterior walls required to have a fire-resistance rating shall comply with Section 714. Penetrations by ducts and air transfer openings shall comply with Section 705.10.

Exception: Exterior walls that are permitted to have unprotected openings in accordance with Section 705.8 do not require protection of penetrations.

Revise as follows:

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

Exception: Exterior walls that are permitted to have unprotected openings in accordance with Section 705.8 do not require protection of penetrations.

Reason: This proposal adds a requirement to protect penetrations where a fire-resistance rated exterior wall is not allowed to have any other unprotected openings. Similar language and requirements already exist in IBC Sections 705.9, 705.10 and 717.5.6 to protect joints, and duct and air transfer openings in exterior walls. In addition, the International Residential Code (IRC) requires penetrations in exterior walls to be protected where the fire separation distance is less than 3 feet in accordance with IRC Tables R302.1(1) and R302.1(2).

Since the current code language is silent on prescriptive requirements, it can be confusing for code officials which may lead to either over-prescribing requirements such as treating penetrations as openings or under-prescribing requirements when everything is required to be protected. This change would only apply in very limited situations where buildings are in close proximity to a property line as identified in Table 705.8 (e.g. within 3 feet for sprinklered protected buildings, or within 5 ft for unprotected nonsprinklered buildings).

Some jurisdictions have already been enforcing this proposed provision because it seems consistent with the intent of the current IBC.

The current language does not limit the size, type, or number of unprotected penetrations through exterior walls, even when no other unprotected elements are allowed, including windows, doors, joints and vents. Fires can spread through unprotected penetrations just as easily as through other unprotected elements. If an exterior wall does not allow unprotected openings, it is because the building is close to a property line. This need for defined limiting distances is well established in the IBC.

By comparison, IBC 705.9 and 705.10 states:

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

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

705.10 Ducts and air transfer openings. Penetrations by air ducts and air transfer openings in fire-resistance-rated exterior walls required to have protected openings shall comply with Section 717.

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

Although this is for very limited situations, being silent on protection of penetrations through fire resistance rated exterior walls which are not otherwise permitted to have unprotected openings is a glaring omission.

FCAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2023 and early 2024 the FCAC has held several virtual meetings and one in-person meeting

open to any interested party. In addition, there were numerous virtual Working Group meetings for the current code development cycle, which included members of the committee as well as interested parties. Related documents and reports are posted on the **FCAC Website**

Cost Impact: Increase

Estimated Immediate Cost Impact:

The average cost of an installed firestop system for exterior walls is $50 - $60 per penetration

Estimated Immediate Cost Impact Justification (methodology and variables):

The cost provided is based on industry and manufacturer input. This includes average materials and labor costs for any type of penetrant through or into the wall assembly. The cost range includes both sides of wall assembly and any additional requirements for weather protection. The total cost in any given exterior wall will depend upon the number of penetrations.

FS18-24

FS19-24

IBC: 705.12, 706.6, TABLE 721.1(3), 2603.3, 2603.4.1.5, 2610.1

Proponents: Aaron Phillips, Asphalt Roofing Manufacturers Association (ARMA), Asphalt Roofing Manufacturers Association (aphillips@asphaltroofing.org)

2024 International Building Code

Revise as follows:

705.12 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 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 assembly*~~*roof covering*~~.
5. In Groups R-2 and R-3 where the entire *building* is provided with a Class C *roof assembly*~~*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).
6. Where the wall is permitted to have not less than 25 percent of the *exterior wall* areas containing unprotected openings based on *fire separation distance* as determined in accordance with Section 705.9.

706.6 Vertical continuity.

Fire walls shall extend from the foundation to a termination point not less than 30 inches (762 mm) above both adjacent roofs.

Exceptions:

1. Stepped *buildings* in accordance with Section 706.6.1.

2. Two-hour fire-resistance-rated walls shall be permitted to terminate at the underside of the roof sheathing, deck or slab, provided that all of the following requirements are met:
   2.1. The lower *roof assembly* within 4 feet (1220 mm) of the wall has not less than a 1-hour *fire-resistance rating* and the entire length and span of supporting elements for the rated *roof assembly* has a *fire-resistance rating* of not less than 1 hour.
   2.2. Openings in the roof shall not be located within 4 feet (1220 mm) of the *fire wall*.
   2.3. Each *building* shall be provided with not less than a Class B *roof assembly*~~*roof covering*~~.

3. Walls shall be permitted to terminate at the underside of noncombustible roof sheathing, deck or slabs where both *buildings* are provided with not less than a Class B *roof assembly*~~*roof covering*~~. Openings in the roof shall not be located within 4 feet (1220 mm) of the *fire wall*.

4. In *buildings* of Types III, IV and V construction, walls shall be permitted to terminate at the underside of combustible roof sheathing or decks, provided that all of the following requirements are met:
   4.1. Roof openings are not less than 4 feet (1220 mm) from the *fire wall*.
   4.2. The roof is covered with a minimum Class B *roof assembly*~~*roof covering*~~.
   4.3. The roof sheathing or deck is constructed of *fire-retardant-treated wood* for a distance of 4 feet (1220 mm) on both sides of the wall or the roof is protected with $^{5}/_{8}$-inch (15.9 mm) *Type X gypsum board* directly beneath the underside of the roof sheathing or deck, supported by not less than 2-inch (51 mm) nominal ledgers attached to the sides of the roof framing members for a distance of not less than 4 feet (1220 mm) on both sides of the *fire wall*.

5. In *buildings* designed in accordance with Section 510.2, *fire walls* located above the 3-hour *horizontal assembly* required by Section 510.2, Item 1 shall be permitted to extend from the top of this *horizontal assembly*.

6. *Buildings* with sloped roofs in accordance with Section 706.6.2.

TABLE 721.1(3) MINIMUM PROTECTION FOR FLOOR AND ROOF SYSTEMS [a, q]

FLOOR OR ROOF CONSTRUCTION	ITEM NUMBER	CEILING CONSTRUCTION	THICKNESS OF FLOOR OR ROOF SLAB (inches)				MINIMUM THICKNESS OF CEILING (inches)			
			4 hours	3 hours	2 hours	1 hour	4 hours	3 hours	2 hours	1 hour
1. Siliceous aggregate concrete	1-1.1	Slab (ceiling not required). Minimum cover over nonprestressed reinforcement shall be not less than $^{3}/_{4}$".[b]	7.0	6.2	5.0	3.5	—	—	—	—
2. Carbonate aggregate concrete	2-1.1		6.6	5.7	4.6	3.2	—	—	—	—
3. Sand-lightweight concrete	3-1.1		5.4	4.6	3.8	2.7	—	—	—	—
4. Lightweight concrete	4-1.1		5.1	4.4	3.6	2.5	—	—	—	—
5. Reinforced concrete	5-1.1	Slab with suspended ceiling of vermiculite gypsum plaster over metal lath attached to $^{3}/_{4}$" cold-rolled channels spaced 12" on center. Ceiling located 6" minimum below joists.	3	2	—	—	1	$^{3}/_{4}$	—	—
	5-2.1	$^{5}/_{8}$" 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-shaped galvanized steel channels with 1"-long No. 6 screws. The channels are spaced 24" on center, span 35" and are supported along their length at 35" intervals by 0.033" (No. 21 galvanized 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 concrete joists with $^{5}/_{32}$" by $1^{1}/_{4}$"-long power-driven fasteners. The wallboard is installed with the long dimension perpendicular to the channels. End joints occur on channels and supplementary channels are installed parallel to the main channels, 12" each side, at end joint occurrences. The finished ceiling is located approximately 12" below the soffit of the floor slab.	—	—	$2^{1}/_{2}$	—	—	—	$^{5}/_{8}$	—
6. Steel joists constructed with a poured reinforced concrete slab on metal lath forms or steel form units.[d, e]	6-1.1	Gypsum plaster on metal lath attached to the bottom cord with single No. 16 gage or doubled No. 18 gage wire ties spaced 6" on center. Plaster mixed 1:2 for scratch coat, 1:3 for brown coat, by weight, gypsum-to-sand aggregate for 2-hour system. For 3-hour system plaster is neat.	—	—	$2^{1}/_{2}$	$2^{1}/_{4}$	—	—	$^{3}/_{4}$	$^{5}/_{8}$

FLOOR OR ROOF CONSTRUCTION	ITEM NUMBER	CEILING CONSTRUCTION	THICKNESS OF FLOOR OR ROOF SLAB (inches)				MINIMUM THICKNESS OF CEILING (inches)			
			4 hours	3 hours	2 hours	1 hour	4 hours	3 hours	2 hours	1 hour
	6-2.1	Vermiculite gypsum plaster on metal lath attached to the bottom chord with single No. 16 gage or doubled 0.049-inch (No. 18 B.W. gage) wire ties 6" on center.	—	2	—	—	—	5/8	—	—
	6-3.1	Cement plaster over metal lath attached to the bottom chord of joists with single No. 16 gage or doubled 0.049" (No. 18 B.W. gage) wire ties spaced 6" on center. Plaster mixed 1:2 for scratch coat, 1:3 for brown coat for 1-hour system and 1:1 for scratch coat, 1:1 1/2 for brown coat for 2-hour system, by weight, cement to sand.	—	—	—	2	—	—	—	5/8[f]
	6-4.1	Ceiling of 5/8" Type X wallboard[c] attached to 7/8" deep by 2 5/8" by 0.021 inch (No. 25 carbon sheet steel gage) hat-shaped furring channels 12" on center with 1"-long No. 6 wallboard screws at 8" on center. Channels wire tied to bottom chord of joists with doubled 0.049 inch (No. 18 B.W. gage) wire or suspended below joists on wire hangers.[g]	—	—	2 1/2	—	—	—	5/8	—
	6-5.1	Wood-fibered gypsum plaster mixed 1:1 by weight gypsum to sand aggregate applied over metal lath. Lath tied 6" on center to 3/4" channels spaced 13 1/2" on center. Channels secured to joists at each intersection with two strands of 0.049 inch (No. 18 B.W. gage) galvanized wire.	—	—	2 1/2	—	—	—	3/4	—
7. Reinforced concrete slabs and joists with hollow clay tile fillers laid end to end in rows 2 1/2" or more apart; reinforcement placed between rows and concrete cast around and over tile.	7-1.1	5/8" gypsum plaster on bottom of floor or roof construction.	—	—	8[h]	—	—	—	5/8	—
	7-1.2	None	—	—	—	5 1/2[i]	—	—	—	—
8. Steel joists constructed with a reinforced concrete slab on top poured on a 1/2"-deep steel deck.[e]	8-1.1	Vermiculite gypsum plaster on metal lath attached to 3/4" cold-rolled channels with 0.049" (No. 18 B.W. gage) wire ties spaced 6" on center.	2 1/2[j]	—	—	—	3/4	—	—	—
9. 3"-deep cellular steel deck with concrete slab on top. Slab thickness measured to top.	9-1.1	Suspended ceiling of vermiculite gypsum plaster base coat and vermiculite acoustical plaster on metal lath attached at 6" intervals to 3/4" cold-rolled channels spaced 12" on center and secured to 1 1/2" cold-rolled channels spaced 36" on center with 0.065" (No. 16 B.W. gage) wire. 1 1/2" channels supported by No. 8 gage wire hangers at 36" on center. Beams within envelope and with a 2 1/2" airspace between beam soffit and lath have a 4-hour rating.	2 1/2	—	—	—	1 1/8[k]	—	—	—
10. 1 1/2"-deep steel roof deck on steel framing. Insulation board, 30 pcf density, composed of wood fibers with cement binders of thickness shown bonded to deck with unified asphalt adhesive. Covered with a Class A or B *roof assembly*~~roof covering~~ .	10-1.1	Ceiling of gypsum plaster on metal lath. Lath attached to 3/4" furring channels with 0.049" (No. 18 B.W. gage) wire ties spaced 6" on center. 3/4" channel saddle tied to 2" channels with doubled 0.065" (No. 16 B.W. gage) wire ties. 2"channels spaced 36" on center suspended 2" below steel framing and saddle tied with 0.165" (No. 8 B.W. gage) wire. Plaster mixed 1:2 by weight, gypsum-to-sand aggregate.	—	—	1 7/8	1	—	—	3/4[i]	3/4[i]
11. 1 1/2"-deep steel roof deck on steel-framing wood fiber insulation board, 17.5 pcf density on top applied over a 15-lb asphalt-saturated felt. Class A or B *roof assembly*~~roof covering~~.	11-1.1	Ceiling of gypsum plaster on metal lath. Lath attached to 3/4" furring channels with 0.049" (No. 18 B.W. gage) wire ties spaced 6" on center. 3/4" channels saddle tied to 2" channels with doubled 0.065" (No. 16 B.W. gage) wire ties. 2" channels spaced 36" on center suspended 2" below steel framing and saddle tied with 0.165" (No. 8 B.W. gage) wire. Plaster mixed 1:2 for scratch coat and 1:3 for brown coat, by weight, gypsum-to-sand aggregate for 1-hour system. For 2-hour system, plaster mix is 1:2 by weight, gypsum-to-sand aggregate.	—	—	1 1/2	1	—	—	7/8[g]	3/4[i]
12. 1 1/2" deep steel roof deck on steel-framing insulation of rigid board consisting of expanded perlite and fibers impregnated with integral asphalt waterproofing; density 9 to 12 pcf secured to metal roof deck by 1/2"-wide ribbons of waterproof, cold-process liquid adhesive spaced 6" apart. Steel joist or light steel construction with metal roof deck, insulation, and Class A or B built-up *roof assembly*~~roof covering~~.[e]	12-1.1	Gypsum-vermiculite plaster on metal lath wire tied at 6" intervals to 3/4" furring channels spaced 12" on center and wire tied to 2" runner channels spaced 32" on center. Runners wire tied to bottom chord of steel joists.	—	—	1	—	—	—	7/8	—
13. Double wood floor over wood joists spaced 16" on center.[m, n]	13-1.1	Gypsum plaster over 3/8" Type X gypsum lath. Lath initially applied with not less than four 1 1/8" by No. 13 gage by 19/64" head plasterboard blued nails per bearing. Continuous stripping over lath along all joist lines. Stripping consists of 3"-wide strips of metal lath attached by 1 1/2" by No. 11 gage by 1/2" head roofing nails spaced 6" on center. Alternate stripping consists of 3"-wide 0.049" diameter wire stripping weighing 1 pound per square yard and attached by No. 16 gage by 1 1/2" by 3/4" crown width staples, spaced 4" on center. Where alternate stripping is used, the lath nailing shall consist of two nails at each end and one nail at each intermediate bearing. Plaster mixed 1:2 by weight, gypsum-to-sand aggregate.	—	—	—	—	—	—	—	7/8
	13-1.2	Cement or gypsum plaster on metal lath. Lath fastened with 1 1/2" by No. 11 gage by 7/16" head barbed shank roofing nails spaced 5" on center. Plaster mixed 1:2 for scratch coat and 1:3 for brown coat, by weight, cement to sand aggregate.	—	—	—	—	—	—	—	5/8

FLOOR OR ROOF CONSTRUCTION	ITEM NUMBER	CEILING CONSTRUCTION	THICKNESS OF FLOOR OR ROOF SLAB (inches)				MINIMUM THICKNESS OF CEILING (inches)			
			4 hours	3 hours	2 hours	1 hour	4 hours	3 hours	2 hours	1 hour
	13-1.3	Perlite or vermiculite gypsum plaster on metal lath secured to joists with 1 1/2" by No. 11 gage by 7/16" head barbed shank roofing nails spaced 5" on center.	—	—	—	—	—	—	—	5/8
	13-1.4	1/2" Type X gypsum wallboard[c] nailed to joists with 5d cooler[o] or wallboard[o] nails at 6" on center. End joints of wallboard centered on joists.	—	—	—	—	—	—	—	1/2
14. Plywood stressed skin panels consisting of 5/8"-thick interior C-D (exterior glue) top stressed skin on 2" × 6" nominal (minimum) stringers. Adjacent panel edges joined with 8d common wire nails spaced 6" on center. Stringers spaced 12" maximum on center.	14-1.1	1/2"-thick wood fiberboard weighing 15 to 18 pounds per cubic foot installed with long dimension parallel to stringers or 3/8" C-D (exterior glue) plywood glued and/or nailed to stringers. Nailing to be with 5d cooler[o] or wallboard[o] nails at 12" on center. Second layer of 1/2" Type X gypsum wallboard[c] applied with long dimension perpendicular to joists and attached with 8d cooler[o] or wallboard[o] nails at 6" on center at end joints and 8" on center elsewhere. Wallboard joints staggered with respect to fiberboard joints.	—	—	—	—	—	—	—	1
15. Vermiculite concrete slab proportioned 1:4 (Portland cement to vermiculite aggregate) on a 1 1/2"-deep steel deck supported on individually protected steel framing. Maximum span of deck 6′-10" where deck is less than 0.019 inch (No. 26 carbon steel sheet gage) or greater. Slab reinforced with 4" × 8" 0.109/0.083" (No. 12/14 B.W. gage) welded wire mesh.	15-1.1	None	—	—	—	3[j]	—	—	—	—
16. Perlite concrete slab proportioned 1:6 (Portland cement to perlite aggregate) on a 1 1/4"-deep steel deck supported on individually protected steel framing. Slab reinforced with 4" × 8" 0.109/0.083" (No. 12/14 B.W. gage) welded wire mesh.	16-1.1	None	—	—	—	3 1/2[j]	—	—	—	—
17. Perlite concrete slab proportioned 1:6 (Portland cement to perlite aggregate) on a 9/16"-deep steel deck supported by steel joists 4′ on center. Class A or B *roof assembly* ~~roof covering~~ on top.	17-1.1	Perlite gypsum plaster on metal lath wire tied to 3/4" furring channels attached with 0.065" (No. 16 B.W. gage) wire ties to lower chord of joists.	—	2[p]	2[p]	—	—	7/8	3/4	—
18. Perlite concrete slab proportioned 1:6 (Portland cement to perlite aggregate) on 1 1/4"-deep steel deck supported on individually protected steel framing. Maximum span of deck 6′-10" where deck is less than 0.019" (No. 26 carbon sheet steel gage) and 8′-0" where deck is 0.019" (No. 26 carbon sheet steel gage) or greater. Slab reinforced with 0.042" (No. 19 B.W. gage) hexagonal wire mesh. Class A or B *roof assembly* ~~roof covering~~ on top.	18-1.1	None	—	2 1/4[p]	2 1/4[p]	—	—	—	—	—
19. Floor and beam construction consisting of 3"-deep cellular steel floor unit mounted on steel members with 1:4 (proportion of Portland cement to perlite aggregate) perlite-concrete floor slab on top.	19-1.1	Suspended envelope ceiling of perlite gypsum plaster on metal lath attached to 3/4" cold-rolled channels, secured to 1 1/2" cold-rolled channels spaced 42" on center supported by 0.203 inch (No. 6 B.W. gage) wire 36" on center. Beams in envelope with 3" minimum airspace between beam soffit and lath have a 4-hour rating.	2[p]	—	—	—	1[l]	—	—	—
20. Perlite concrete proportioned 1:6 (Portland cement to perlite aggregate) poured to 1/8" thickness above top of corrugations of 1 5/16"-deep galvanized steel deck maximum span 8′-0" for 0.024" (No. 24 galvanized sheet gage) or 6′-0" for 0.019" (No. 26 galvanized sheet gage) with deck supported by individually protected steel framing. Approved polystyrene foam plastic insulation board having a flame spread not exceeding 75 (1" to 4" thickness) with vent holes that approximate 3 percent of the board surface area placed on top of perlite slurry. A 2′ by 4′ insulation board contains six 2 3/4" diameter holes. Board covered with 2 1/4" minimum perlite concrete slab. Slab reinforced with mesh consisting of 0.042" (No.19 B.W. gage) galvanized steel wire twisted together to form 2" hexagons with straight 0.065" (No. 16 B.W. gage) galvanized steel wire woven into mesh and spaced 3". Alternate slab reinforcement shall be permitted to consist of 4" × 8", 0.109/0.238" (No. 12/4 B.W. gage), or 2" × 2", 0.083/0.083" (No. 14/14 B.W. gage) welded wire fabric. Class A or B *roof assembly* ~~roof covering~~ on top.	20-1.1	None	—	—	Varies	—	—	—	—	—
21. Wood joists, wood I-joists, floor trusses and flat or pitched roof trusses spaced a maximum 24" o.c. with 1/2" wood structural panels with exterior glue applied at right angles to top of joist or top chord of trusses with 8 dnails. The wood structural panel thickness shall be not less than nominal 1/2" nor less than required by Chapter 23.	21-1.1	Base layer 5/8" Type X gypsum wallboard applied at right angles to joist or truss 24" o.c. with 1 1/4" Type S or Type W drywall screws 24" o.c. Face layer 5/8" Type X gypsum wallboard or veneer base applied at right angles to joist or truss through base layer with 1 7/8" Type S or Type W drywall screws 12" o.c. at joints and intermediate joist or truss. Face layer Type G drywall screws placed 2" back on either side of face layer end joints, 12" o.c.	—	—	—	Varies	—	—	—	1 1/4
22. Steel joists, floor trusses and flat or pitched roof trusses spaced a maximum 24" o.c. with 1/2" wood structural panels with exterior glue applied at right angles to top of joist or top chord of trusses with No. 8 screws. The wood structural panel thickness shall be not less than nominal 1/2" nor less than required by Chapter 23.	22-1.1	Base layer 5/8" Type X gypsum board applied at right angles to steel framing 24" on center with 1" Type S dry wall screws spaced 24" on center. Face layer 5/8" Type X gypsum board applied at right angles to steel framing attached through base layer with 1 5/8" Type S dry wall screws 12" on center at end joints and intermediate joints and 1 1/2" Type G dry wall screws 12 inches on center placed 2" back on either side of face layer end joints. Joints of the face layer are offset 24" from the joints of the base layer.	—	—	—	Varies	—	—	—	1 1/4

FLOOR OR ROOF CONSTRUCTION	ITEM NUMBER	CEILING CONSTRUCTION	THICKNESS OF FLOOR OR ROOF SLAB (inches)				MINIMUM THICKNESS OF CEILING (inches)			
			4 hours	3 hours	2 hours	1 hour	4 hours	3 hours	2 hours	1 hour
23. Wood I-joist (minimum joist depth 9 1/4" with a minimum flange depth of 1 5/16" and a minimum flange cross-sectional area of 2.25 square inches) at 24" o.c. spacing with a minimum 1 × 4 (3/4" × 3.5"actual) ledger strip applied parallel to and covering the bottom of the bottom flange of each member, tacked in place. 2" mineral wool insulation, 3.5 pcf (nominal) installed adjacent to the bottom flange of the I-joist and supported by the 1 × 4 ledger strip.	23-1.1	1/2"-deep single-leg resilient channel 16" on center (channels doubled at wallboard end joints), placed perpendicular to the furring strip and joist and attached to each joist by 1 7/8" Type S drywall screws. 5/8" Type C gypsum wallboard applied perpendicular to the channel with end joints staggered not less than 4′ and fastened with 1 1/8" Type S drywall screws spaced 7" on center. Wallboard joints to be taped and covered with joint compound.	—	—	—	Varies	—	—	—	5/8
24. Wood I-joist (minimum I-joist depth 9 1/4" with a minimum flange depth of 1 1/2" and a minimum flange cross-sectional area of 5.25 square inches; minimum web thickness of 3/8") @ 24" o.c., 1 1/2" mineral wool insulation (2.5 pcf-nominal) resting on hat-shaped furring channels.	24-1.1	Minimum 0.026" thick hat-shaped channel 16" o.c. (channels doubled at wallboard end joints), placed perpendicular to the joist and attached to each joist by 1 1/4" Type S drywall screws. 5/8" Type C gypsum wallboard applied perpendicular to the channel with end joints staggered and fastened with 1 1/8" Type S drywall screws spaced 12" o.c. in the field and 8" o.c. at the wallboard ends. Wallboard joints to be taped and covered with joint compound.	—	—	—	Varies	—	—	—	5/8
25. Wood I-joist (minimum I-joist depth 9 1/4" with a minimum flange depth of 1 1/2" and a minimum flange cross-sectional area of 5.25 square inches; minimum web thickness of 7/16") @ 24" o.c., 1 1/2" mineral wool insulation (2.5 pcf-nominal) resting on resilient channels.	25-1.1	Minimum 0.019"-thick resilient channel 16" o.c. (channels doubled at wallboard end joints), placed perpendicular to the joist and attached to each joist by 1 5/8" Type S drywall screws. 5/8" Type C gypsum wallboard applied perpendicular to the channel with end joints staggered and fastened with 1" Type S drywall screws spaced 12" o.c. in the field and 8" o.c. at the wallboard ends. Wallboard joints to be taped and covered with joint compound.	—	—	—	Varies	—	—	—	5/8
26. Wood I-joist (minimum I-joist depth 9 1/4" with a minimum flange thickness of 1 1/2" and a minimum flange cross-sectional area of 2.25 square inches; minimum web thickness of 3/8") @ 24" o.c.	26-1.1	Two layers of 1/2" Type X gypsum wallboard applied with the long dimension perpendicular to the I-joists with end joints staggered. The base layer is fastened with 1 5/8" Type S dry wall screws spaced 12" o.c. and the face layer is fastened with 2" Type S drywall screws spaced 12" o.c. in the field and 8" o.c. on the edges. Face layer end joints shall not occur on the same I-joist as base layer end joints and edge joints shall be offset 24"from base layer joints. Face layer to also be attached to base layer with 1 1/2" Type G drywall screws spaced 8" o.c. placed 6" from face layer end joints. Face layer wallboard joints to be taped and covered with joint compound.	—	—	—	Varies	—	—	—	1
27. Wood I-joist (minimum I-joist depth 9 1/2" with a minimum flange depth of 1 5/16" and a minimum flange cross-sectional area of 1.95 square inches; minimum web thickness of 3/8") @ 24" o.c.	27-1.1	Minimum 0.019" thick resilient channel 16" o.c. (channels doubled at wallboard end joints), placed perpendicular to the joist and attached to each joist by 1 1/4" Type S drywall screws. Two layers of 1/2" Type X gypsum wallboard applied with the long dimension perpendicular to the resilient channels with end joints staggered. The base layer is fastened with 1 1/4" Type S drywall screws spaced 12" o.c. and the face layer is fastened with 1 5/8" Type S drywall screws spaced 12" o.c. Face layer end joints shall not occur on the same I-joist as base layer end joints and edge joints shall be offset 24" from base layer joints. Face layer to also be attached to base layer with 1 1/2" Type G drywall screws spaced 8" o.c. placed 6" from face layer end joints. Face layer wallboard joints to be taped and covered with joint compound.	—	—	—	Varies	—	—	—	1
28. Wood I-joist (minimum I-joist depth 9 1/4" with a minimum flange depth of 1 1/2" and a minimum flange cross-sectional area of 2.25 square inches; minimum web thickness of 3/8") @ 24" o.c. Unfaced fiberglass insulation or mineral wool insulation is installed between the I-joists supported on the upper surface of the flange by stay wires spaced 12" o.c.	28-1.1	Base layer of 5/8" Type C gypsum wallboard attached directly to I-joists with 1 5/8" Type S drywall screws spaced 12" o.c. with ends staggered. Minimum 0.0179"-thick hat-shaped 7/8-inch furring channel 16" o.c. (channels doubled at wallboard end joints), placed perpendicular to the joist and attached to each joist by 1 5/8" Type S drywall screws after the base layer of gypsum wallboard has been applied. The middle and face layers of 5/8" Type C gypsum wallboard applied perpendicular to the channel with end joints staggered. The middle layer is fastened with 1" Type S drywall screws spaced 12" o.c. The face layer is applied parallel to the middle layer but with the edge joints offset 24" from those of the middle layer and fastened with 1 5/8" Type S drywall screws 8" o.c. The joints shall be taped and covered with joint compound.	—	—	—	Varies	—	—	2 3/4	—

FLOOR OR ROOF CONSTRUCTION	ITEM NUMBER	CEILING CONSTRUCTION	THICKNESS OF FLOOR OR ROOF SLAB (inches)				MINIMUM THICKNESS OF CEILING (inches)			
			4 hours	3 hours	2 hours	1 hour	4 hours	3 hours	2 hours	1 hour
29. Channel-shaped 18 gage steel joists (minimum depth 8") spaced a maximum 24" o.c. supporting tongue-and-groove wood structural panels (nominal minimum $^{3}/_{4}$"-thick) applied perpendicular to framing members. Structural panels attached with $1^{5}/_{8}$" Type S-12 screws spaced 12" o.c.	29-1.1	Base layer $^{5}/_{8}$" Type X gypsum board applied perpendicular to bottom of framing members with $1^{1}/_{8}$" Type S-12 screws spaced 12" o.c. Second layer $^{5}/_{8}$" Type X gypsum board attached perpendicular to framing members with $1^{5}/_{8}$" Type S-12 screws spaced 12" o.c. Second layer joints offset 24" from base layer. Third layer $^{5}/_{8}$" Type X gypsum board attached perpendicular to framing members with $2^{3}/_{8}$" Type S-12 screws spaced 12" o.c. Third layer joints offset 12" from second layer joints. Hat-shaped $^{7}/_{8}$-inch rigid furring channels applied at right angles to framing members over third layer with two $2^{3}/_{8}$" TypeS-12 screws at each framing member. Face layer $^{5}/_{8}$" Type X gypsum board applied at right angles to furring channels with $1^{1}/_{8}$" Type S screws spaced 12" o.c.	—	—	Varies	—	—	—	$3^{3}/_{8}$	—
30. Wood I-joist (minimum I-joist depth $9^{1}/_{2}$" with a minimum flange depth of $1^{1}/_{2}$" and a minimum flange cross-sectional area of 2.25 square inches; minimum web thickness of $^{3}/_{8}$") @ 24" o.c. Fiberglass insulation placed between I-joists supported by the resilient channels.	30-1.1	Minimum 0.019"-thick resilient channel 16" o.c. (channels doubled at wallboard end joints), placed perpendicular to the joists and attached to each joist by $1^{1}/_{4}$" Type S dry wall screws. Two layers of $^{1}/_{2}$" Type X gypsum wallboard applied with the long dimension perpendicular to the resilient channels with end joints staggered. The base layer is fastened with $1^{1}/_{4}$" Type S drywall screws spaced 12" o.c. and the face layer is fastened with $1^{5}/_{8}$" Type S drywall screws spaced 12" o.c. Face layer end joints shall not occur on the same I-joist as base layer end joints and edge joints shall be offset 24" from base layer joints. Face layer to be attached to base layer with $1^{1}/_{2}$" Type G drywall screws spaced 8" o.c. placed 6" from face layer end joints. Face layer wallboard joints to be taped and covered with joint compound.	—	—	—	Varies	—	—	—	1
31. Wood I-joist (minimum I-joist depth $9^{1}/_{4}$" with a minimum flange thickness of $1^{1}/_{2}$" and a minimum flange crosssectional area of 2.25 square inches; minimum web thickness of $^{3}/_{8}$") @ 24" o.c.	31- 1.1	Two layers of $^{1}/_{2}$" Type C gypsum wallboard applied with the long dimension perpendicular to the I-joists with end joints staggered. The base layer is fastened with 1" Type S drywall screws spaced 12" o.c. and the face layer is fastened with $1^{5}/_{8}$" Type S drywall screws spaced 12" o.c. in the field and 8" o.c. on the edges. Face layer edge joints shall not occur on the same I-joist as base layer end joints and edge joints shall be offset 24" from base layer joints. End joints centered on bottom flange of I-joists and offset a minimum of 48" from those of base layer. Face layer to also be attached to base layer with $1^{1}/_{2}$" Type G drywall screws spaced 8" o.c. with a 4" stagger, placed 6" from face layer end joints. Face layer wallboard joints taped and covered with joint compound. Screw heads covered with joint compound.	—	—	Varies	—	—	—	—	—

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 specified.

2603.3 Surface-burning characteristics.

Unless otherwise indicated in this section, *foam plastic insulation* and foam plastic cores of manufactured assemblies shall have a *flame spread index* of not more than 75 and a *smoke-developed index* of not more than 450 where tested in the maximum thickness intended for use in accordance with ASTM E84 or UL 723. Loose fill-type *foam plastic insulation* shall be tested as board stock for the *flame spread* and smoke-developed indices.

Exceptions:

1. *Smoke-developed index* for interior *trim* as provided for in Section 2604.2.
2. In cold storage *buildings*, ice plants, food plants, food processing rooms and similar areas, *foam plastic insulation* where tested in a thickness of 4 inches (102 mm) shall be permitted in a thickness up to 10 inches (254 mm) where the *building* is equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1. The *approved automatic sprinkler system* shall be provided in both the room and that part of the *building* in which the room is located.

3. *Foam plastic insulation* that is a part of a Class A, B or C *roof assembly* where tested in accordance with ASTM E108 or UL 790~~roof covering assembly~~ provided that the assembly with the *foam plastic insulation* satisfactorily passes NFPA 276 or UL 1256. The *smoke-developed index* shall not be limited for roof applications.
4. *Foam plastic insulation* greater than 4 inches (102 mm) in thickness shall have a maximum *flame spread index* of 75 and a *smoke-developed index* of 450 where tested at a minimum thickness of 4 inches (102 mm), provided that the end use is *approved* in accordance with Section 2603.9 using the maximum thickness and density intended for use.
5. *Flame spread* and smoke-developed indices for foam plastic interior signs in *covered and open mall buildings* provided that the signs comply with Section 402.6.4.

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 assembly*~~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 *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.

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.

Exception: Skylights in which the light-transmitting plastic conforms to the required *roof assembly* classification~~roof covering class~~ in accordance with Section 1505.

Reason: This proposal corrects instances where results of ASTM E108 or UL 790 tests are associated with a *roof covering* or roof-covering assembly instead of a *roof assembly.* This continues work from the prior cycle in which clarifications were made to IBC Section 1505 on this matter (S1-21). ASTM E108 and UL 790 tests cannot be performed on a *roof covering,* but involve a *roof covering* (and sometimes other elements such as insulation or underlayment) installed onto a *roof deck.* These tests are always performed on a *roof assembly*, which by definition includes a *roof covering* and a *roof deck.*

Another proposal will be offered in Group B to address this issue in applicable Group B code sections. A complicating issue is that the current definition of *roof assembly* limits its applicability to IBC Chapter 15. However, there are already several instances where the defined term is evoked outside Chapter 15 (e.g., IBC 602.4.1.4, several times in IBC Chapter 7). As a result, a proposal to remove the Chapter 15 limitation is planned for Group B.

Cost Impact: The change proposal is editorial in nature or a clarification and has no cost impact on the cost of construction

Justification for no cost impact:

This proposal makes only clarifying changes, so no impact on cost of construction is expected.

FS19-24

FS20-24

IBC: 706.1

Proponents: Ronald Clements, Chesterfield County, VA, Chesterfield County, VA (clementsro@chesterfield.gov)

2024 International Building Code

Revise as follows:

706.1 General. Each portion of a building separated by one or more *fire walls* that comply with the provisions of this section shall be considered a separate building. *Fire walls* shall be constructed in accordance with Sections 706.2 through 706.11. The extent and location of such *fire walls* shall provide a complete separation. Where a *fire wall* separates occupancies that are required to be separated by a *fire barrier* wall, the most restrictive requirements of each separation shall apply. *Equipment* and systems are permitted to serve multiple portions of a building separated by one or more *fire walls.*

Reason: G130-15 (provided below) removed the code text from 706.1 that states portions of buildings separated by fire walls shall be considered separate buildings. The result of G130-15 is that fire walls no longer create separate buildings per 706.1. Application of fire walls is now code provision specific. Section 503.1 was revised to address how fire walls impact application of allowable height and area provisions, but no such provision was added to other chapters or sections, such as chapter 9 as an example, to address how fire walls impact application of other code provisions applicable to buildings. The code change reason does not state intent to remove the ability to use fire walls to create separate buildings for the purpose of application of chapter 9 provisions, or separate control areas, or create separate buildings for a host of other code requirements that are building based. So, it appears an unintended consequence. The reason statement states the code change “will clarify application,” so it appears it was not the intent to make the significant technical change that resulted from G130.15.This code change returns the text from the 2015 edition "portions of buildings separated by fire walls shall be considered separate buildings", which makes it clear that fire walls create separate buildings for application all code provisions where separating a building into multiple buildings provides a code compliance solution. I am not the first to point out the unintended consequence of G130.15. F288-18 (provided below) was submitted to address the problem G130-15 caused regarding application of IBC section 414.2.3 and IFC section 5003.8.3.3 regarding separation of control areas. The F288-15 reason statement states: “This resulted in an unintended consequence in its application to control areas.” The Fire Code Committee agreed that G130-15 created “unintended consequences”, the report of the CAH states: F288-18 Committee Action: Approved as Submitted Committee Reason: This proposal fixed an unintended consequence that occurred clarifying the fire wall requirements for the 2018 code that appeared to not allow the use of fire walls for other than building height and area. This will allow the fire wall to create a separate building for the application of control areas. (Vote: 13-1).

Unfortunately, there are more unintended consequences than F288-18 could address. Just using the provisions of chapter 9 as another example, though IBC 901.7 provides that fire walls can be used to create fire areas for the application of chapter 9 fire protection thresholds, it does not establish use of fire walls to create separate buildings. This was not necessary based on the prior provision of 706.1, which already established use of fire walls to create buildings. As an example, under 2015 and prior, a 40,000 square foot group S-1 building could have been built with a fire wall dividing the building into two 20,000 sf buildings and then each of those buildings could be divided by fire barriers into 10,000 sf fire areas; or, you could build it with fire walls as four 10,000 foot buildings. In both cases no sprinkler is required. Based on G130.15, both scenarios now require the entire building, the 40,000 sf under roof, to be sprinklered. That is a huge change, and it was not mentioned or justified in the reason statement to G130-15. Note that multiple sections in chapter 9 both for sprinklers and fire alarm systems set thresholds and extent of installation based on buildings and building area, not just fire area.

I considered adding a statement to 901.7 similar to the F288-15 change, but that is putting another band-aid on the problem. The simplest and most efficient solution is to return the language of 706.1 back to the 2015 version that establishes portions of buildings separated by fire walls shall be considered separate buildings. To address the issue that G130-15 was attempting to correct, the sole issue according to the reasons statement and cost impact statement, I have proposed the last sentence to address the issue of permitting systems to serve building portions separated by fire walls.

G130-15 *The purpose of this proposal is to clarify the intent of these sections of the Code that the requirement for a fire wall in Sections 503.1 and 706.1 is predicated on the determination of the maximum allowable height and area calculations under Chapter 5. Using these sections of Code to control other building features or elements such as means of egress, building systems or building utilities is not*

intended or implied by these sections of the Code. However, by inclusion of the first sentence in Section 706.1 some code officials have incorrectly interpreted that language to mean that the portions of the various elements and systems on each side of a fire wall must be completely self-contained. There are no requirements in the I Codes that mandate that the placement of fire walls to create a separate building such that its building features need to be separated from other like building features in adjacent buildings. The scope of Section 706 is to provide the technical requirements for the construction of a fire wall. The added language in Section 503.1 along with the strikeout and added language in Section 706.1 will clarify application of these two sections. Cost Impact: Will not increase the cost of construction The cost of construction will be reduced by eliminating incorrect application of Section 706.1.

F288-18 *IFC: 5003.8.3.3; IBC: [F]414.2.3 Proponent: Kevin Scott, representing KH Scott & Associates LLC (khscottassoc@gmail.com) 2018 International Fire Code Revise as follows: 5003.8.3.3 Number . The maximum number of control areas per floor within a building shall be in accordance with Table 5003.8.3.2. For the purposes of determining the number of control areas within a building, each portion of a building separated by one or more fire walls complying with Section 706 of the International Building Code shall be considered a separate building. 2018 International Building Code Revise as follows: [F] 414.2.3 Number . The maximum number of control areas within a building shall be in accordance with Table 414.2.2. For the purposes of determining the number of control areas within a building, each portion of a building separated by one or more fire walls complying with Section 706 shall be considered a separate building. Reason: The language regarding application of fire wall requirements changed in the 2018 IBC as a result of G130-15. Where previously, the code stated that fire walls created separate buildings, it now states that fire walls only create separate buildings when applying height, area and type of construction requirements. This resulted in an unintended consequence in its application to control areas. The number of control areas in a building has previously been counted separately on each side of a fire wall. Based on the 2018 IBC change, quantities in these control areas now must be aggregated which has the potential to place many facilities out of compliance. This proposal states the for control area purposed, fire walls will continue to be assumed to create separate building and will allow that application of the control area requirements to continue. The end result, is that a single-story building can have up to 4 control areas then be divided by a fire wall and up to another 4 control areas. This occurs often in strip malls. See the figure below. (Figure was not copied)*

Cost Impact: Decrease

Estimated Immediate Cost Impact:

$1 and $2 per square foot just for sprinkler system savings. Multiple Web site sources that come up in a Google search state sprinkler installation cost for new commercial buildings range between $1 and $2 per square foot. Based on the example I provide in my reason statement for a 40,000 sf S1 this code change will save between $40,000 and $80,000 dollars for that one building. It is impossible to come up with every potential scenario of savings that this code change will provide. It is important to note that this code change is correcting an unintended consequence of G130-15 which had a cost impact that incorrectly stated: Cost Impact: Will not increase the cost of construction The cost of construction will be reduced by eliminating incorrect application of Section 706.1.

Estimated Immediate Cost Impact Justification (methodology and variables):

$1 and $2 per square foot just for sprinkler system savings. Multiple Web site sources that come up in a Google search state sprinkler installation cost for new commercial buildings range between $1 and $2 per square foot. Based on the example I provide in my reason statement for a 40,000 sf S1 this code change will save between $40,000 and $80,000 dollars for that one building. It is impossible to come up with every potential scenario of savings that this code change will provide. It is important to note that this code change is correcting an unintended consequence of G130-15 which had a cost impact that incorrectly stated: Cost Impact: Will not increase the cost of construction The cost of construction will be reduced by eliminating incorrect application of Section 706.1.

Estimated Life Cycle Cost Impact:

Multiple Web site sources that come up in a Google search state sprinkler annual inspection costs range form $1000 to $5000 depending on system size. Over a 50 year life cycle this is $50k to 250K reduction in cost if the code change is approved based solely on a sprinkler system example.

It is impossible to come up with every potential scenario of savings that this code change will provide. It is important to note that this code change is correcting an unintended consequence of G130-15 which had a cost impact that incorrectly stated: Cost Impact: Will not increase the cost of construction The cost of construction will be reduced by eliminating incorrect application of Section 706.1.

Estimated Life Cycle Cost Impact Justification (methodology and variables):

Multiple Web site sources that come up in a Google search state sprinkler annual inspection costs range form $1000 to $5000

depending on system size. Over a 50 year life cycle this is $50k to 250K reduction in cost if the code change is approved based solely on a sprinkler system example.

It is impossible to come up with every potential scenario of savings that this code change will provide. It is important to note that this code change is correcting an unintended consequence of G130-15 which had a cost impact that incorrectly stated: Cost Impact: Will not increase the cost of construction The cost of construction will be reduced by eliminating incorrect application of Section 706.1.

FS20-24

FS21-24 Part I

IBC: 706.1, 707.1, 708.1, 709.1, 710.1, 711.1, TABLE 307.1.1, 402.4.2.2, 402.4.2.3, [BE] 402.8.7, 402.4.2.1, 404.6, 405.4.2, 405.4.3, 406.3.1, 406.6.4.1, 407.3, [BE] 407.4.4.2, [BE] 407.5, 408.7, 410.4.1, 410.4.2, 412.4.1, 412.3.4, 420.2, 420.3, 420.6, 422.2, 503.1, 508.4.4.1, 509.4.1, 510.7.1, 510.8, 706.1.1, 713.2, 713.5, 713.11, 713.13.3, 713.13.4, 901.7, 909.20.2, 909.20.6.1, 913.2.1, 1009.6.4, 1023.2, 1023.3.1, 1023.12.1, 1024.3, 1026.2, 1028.2, 1030.1.1.1, 3005.4, 3006.3, 3104.5.1; IFC: [BF] 909.20.2, [BF] 909.20.5.1, [BE] 1023.2, [BE] 1023.3.1, [BE] 1023.12.1, [BE] 1026.2, [BE] 1028.2, [BE] 1030.1.1.1

Proponents: Kevin Scott, KH Scott & Associates LLC, self (khscottassoc@gmail.com)

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE FIRE SAFETY CODE COMMITTEE. PART II WILL BE HEARD BY THE FIRE CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THESE COMMITTEES.

2024 International Building Code

Revise as follows:

706.1 General.
Fire walls required by this code or the *International Fire Code* shall be constructed in accordance with Sections 706.2 through 706.11. The extent and location of such *fire walls* shall provide a complete separation. Where a *fire wall* separates occupancies that are required to be separated by a *fire barrier* wall, the most restrictive requirements of each separation shall apply.

707.1 General.
Fire barriers ~~installed as~~ required ~~elsewhere in~~by this code or the *International Fire Code* shall comply with this section.

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 1020.3.
4. Enclosed elevator lobby separation as required by Section 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 *dwelling and sleeping units* in Groups R-1 and R-2 in accordance with Sections 907.2.8.1 and 907.2.9.1.
8. Vestibules in accordance with Section 1028.2.

Revise as follows:

709.1 General.
Vertical and horizontal *smoke barriers* required by this code or the *International Fire Code* shall comply with this section.

710.1 General.
Smoke partitions ~~installed as~~ required ~~elsewhere in the~~by this code or the *International Fire Code* shall comply with this section.

711.1 General.
Horizontal assemblies required by this code or the *International Fire Code* shall comply with Section 711.2. Nonfire-resistance-rated floor and *roof assemblies* shall comply with Section 711.3.

TABLE 307.1.1 HAZARDOUS MATERIALS EXEMPTIONS[a]

MATERIAL CLASSIFICATION	OCCUPANCY OR APPLICATION	EXEMPTION
Combustible fiber	Baled cotton	Densely packed baled cotton shall not be classified as combustible fiber, provided that the bales comply with the packing requirements of ISO 8115.
Corrosive	Building materials	The quantity of commonly used building materials that are classified as corrosive materials is not limited.
	Personal and household products	The quantity of personal and household products that are classified as corrosive materials is not limited in retail displays, provided that the products are in original packaging.
	Retail and wholesale sales occupancies	The quantity of medicines, foodstuffs or consumer products, and cosmetics containing not more than 50 percent by volume of water-miscible liquids, with the remainder of the solutions not being flammable, is not limited. To qualify for this allowance, such materials shall be packaged in individual containers not exceeding 1.3 gallons.
Explosives	Groups B, F, M and S	Storage of special industrial explosive devices is not limited.
	Groups M and R-3	Storage of black powder, smokeless propellant and small arms primers is not limited.
Flammable and combustible liquids and gases	Aerosols	Buildings and structures occupied for the storage of aerosol products, aerosol cooking spray products, or plastic aerosol 3 products shall be classified as Group S-1.
	Alcoholic beverages	The quantity of alcoholic beverages in liquor stores and distributors without bulk storage is not limited.
		The quantity of alcoholic beverages in distilling or brewing of beverages is not limited.
		The storage quantity of beer, distilled spirits and wines in barrels and casks is not limited.
		The quantity of alcoholic beverages in retail and wholesale sales occupancies is not limited. To qualify for this allowance, beverages shall be packaged in individual containers not exceeding 1.3 gallons.
	Cleaning establishments with combustible liquid solvents	The quantity of combustible liquid solvents used in closed systems and having a flash point at or above 140ºF is not limited. To qualify for this allowance, equipment shall be listed by an approved testing agency and the occupancy shall be separated from all other areas of the building by not less than 1-hour fire barriers ~~constructed in accordance with Section 707~~ or ~~1-hour~~ horizontal assemblies ~~constructed in accordance with Section 711~~, or both
		The quantity of combustible liquid solvents having a flash point at or above 200ºF is not limited.
	Closed piping systems	The quantity of flammable and combustible liquids and gases utilized for the operation of machinery or equipment is not limited.
	Fuel	The quantity of liquid or gaseous fuel in fuel tanks on vehicles or motorized equipment is not limited.
		The quantity of gaseous fuels in piping systems and fixed appliances regulated by the International Fuel Gas Code is not limited.
		The quantity of liquid fuels in piping systems and fixed appliances regulated by the International Mechanical Code is not limited.
	Flammable finishing operations using flammable and combustible liquids	Buildings and structures occupied for the application of flammable finishes shall comply with Section 416.
	Fuel oil	The quantity of fuel oil storage complying with Section 605.4.2 of the *International Fire Code* is not limited. .
	Hand sanitizer	The quantity of alcohol-based hand rubs (ABHR) classified as Class I or II liquids in dispensers installed in accordance with Sections 5705.5 and 5705.5.1 of the *International Fire Code* is not limited. The location of the ABHR dispensers shall be provided in the construction documents.
	Retail and wholesale sales occupancies with flammable and combustible liquids	The quantity of medicines, foodstuffs or consumer products, and cosmetics containing not more than 50 percent by volume of water-miscible liquids, with the remainder of the solutions not being flammable, is not limited. To qualify for this allowance, such materials shall be packaged in individual containers not exceeding 1.3 gallons.
Highly toxic and toxic materials	Retail and wholesale sales occupancies	The quantity of medicines, foodstuffs or consumer products, and cosmetics containing not more than 50 percent by volume of water-miscible liquids, with the remainder of the solutions not being flammable, is not limited. To qualify for this allowance, such materials shall be packaged in individual containers not exceeding 1.3 gallons.
Any	Agricultural materials	The quantity of agricultural materials stored or utilized for agricultural purposes on the premises is not limited.
	Energy storage	The quantity of hazardous materials in stationary storage battery systems is not limited.
		The quantity of hazardous materials in stationary fuel cell power systems is not limited.
		The quantity of hazardous materials in capacitor energy storage systems is not limited.
	Refrigeration Systems	The quantity of refrigerants in refrigeration systems is not limited.

For SI: 1 gallon = 3.785L, °C = (°F - 32)/1.8.

a. Exempted materials and conditions listed in this table are required to comply with applicable provisions of the International Fire Code.

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 not less than 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 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 705.5.

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

[BE] 402.8.7 Service areas fronting on exit passageways.

Mechanical rooms, electrical rooms, building service areas and service elevators are permitted to open directly into *exit passageways*, provided that the *exit passageway* is separated from such rooms with not less than 1-hour *fire barriers* ~~constructed in accordance with Section 707~~ or *horizontal assemblies* ~~constructed in accordance with Section 711~~, or both. The *fire protection rating* of openings in the *fire barriers* shall be not less than 1 hour.

402.4.2.1 Tenant separations.

Each tenant space shall be separated from other tenant spaces by ~~a~~ *fire partitions* ~~*partition* complying with Section 708~~. A tenant separation wall is not required between any tenant space and the *mall*.

404.6 Enclosure of atriums.

Atrium spaces shall be separated from adjacent spaces by a 1-hour *fire barrier* ~~constructed in accordance with Section 707~~ or a *horizontal assembly* ~~constructed in accordance with Section 711~~, or both.

Exceptions:

1. A *fire barrier* is not required where a glass wall forming a *smoke partition* is provided. The glass wall shall comply with all of the following:
   1.1. *Automatic* sprinklers are provided along both sides of the separation wall and doors, or on the room side only if there is not a walkway on the *atrium* side. The sprinklers shall be located between 4 inches and 12 inches (102 mm and 305 mm) away from the glass and at intervals along the glass not greater than 6 feet (1829 mm). The sprinkler system shall be designed so that the entire surface of the glass is wet upon activation of the sprinkler system without obstruction.
   1.2. The glass wall shall be installed in a gasketed frame in a manner that the framing system deflects without breaking (loading) the glass before the sprinkler system operates.
   1.3. Where glass doors are provided in the glass wall, they shall be either *self-closing* or automatic-closing.
2. A *fire barrier* is not required where a glass-block wall assembly complying with Section 2110 and having a $^{3}/_{4}$-hour *fire protection rating* is provided.

3. A *fire barrier* is not required between the *atrium* and the adjoining spaces of up to three floors of the *atrium* provided that such spaces are accounted for in the design of the smoke control system.
4. In other than Group I-2 and Group I-1, Condition 2, a *fire barrier* is not required between the *atrium* and the adjoining spaces where the *atrium* is not required to be provided with a smoke control system.
5. In Group I-2 and Group I-1, Condition 2, a *fire barrier* is not required between the *atrium* and the adjoining spaces, other than care recipient sleeping or treatment rooms, for up to three *stories* of the *atrium* provided that such spaces are accounted for in the design of the smoke control system and do not provide access to care recipient sleeping or treatment rooms.
6. A *horizontal assembly* is not required between the *atrium* and openings for escalators complying with Section 712.1.3.
7. A *horizontal assembly* is not required between the *atrium* and openings for *exit access stairways* and *ramps* complying with Item 4 of Section 1019.3.

405.4.2 Smoke barrier penetration.
The compartments shall be separated from each other by ~~a *smoke barrier* in accordance with Section 709~~ *barriers* ~~*barrier* in accordance with Section 709~~. Penetrations between the two compartments shall be limited to plumbing and electrical piping and conduit that are firestopped in accordance with Section 714. Doorways shall be protected by *fire door assemblies* that comply with Section 716, automatic-closing by smoke detection in accordance with Section 716.2.6.6 and installed in accordance with NFPA 105 and Section 716.2.2.1. Where provided, each compartment shall have an air supply and an exhaust system independent of the other compartments.

405.4.3 Elevators.
Where elevators are provided, each compartment shall have *direct access* to an elevator. Where an elevator serves more than one compartment, an enclosed elevator lobby shall be provided and shall be separated from each compartment by a *smoke barrier* ~~in accordance with Section 709~~. Doorways in the *smoke barrier* shall be protected by *fire door assemblies* that comply with Section 716, shall comply with the smoke and draft control assembly requirements of Section 716.2.2.1 with the UL 1784 test conducted without an artificial bottom seal, and shall be automatic-closing by smoke detection in accordance with Section 716.2.6.6.

406.3.1 Classification.
Private garages and carports shall be classified as Group U occupancies. Each *private garage* shall be not greater than 1,000 square feet (93 m^2) in area. Multiple *private garages* are permitted in a *building* where each *private garage* is separated from the other *private garages* by not less than 1-hour *fire barriers* ~~in accordance with Section 707,~~ or ~~1-hour~~ *horizontal assemblies* ~~in accordance with Section 711~~, or both.

406.6.4.1 Separation.
Mechanical-access enclosed parking garages shall be separated from other occupancies and accessory uses by not less than 2-hour *fire barriers* ~~constructed in accordance with Section 707~~ or ~~by not less than 2-hour~~ *horizontal assemblies* ~~constructed in accordance with Section 711~~, or both.

407.3 Corridor wall construction.
Corridor walls shall be constructed as *smoke partitions* ~~in accordance with Section 710~~.

[BE] 407.4.4.2 Separation.
Care suites shall be separated from other portions of the *building*, including other *care suites*, by ~~a *smoke partition* complying with Section 710~~ *partitions* ~~*partition* complying with Section 710~~.

[BE] 407.5 Smoke barriers.
Smoke barriers shall be provided to subdivide every *story* used by *persons* receiving care, treatment or sleeping into not fewer than two *smoke compartments. Smoke barriers* shall be provided to subdivide other *stories* with an *occupant load* of 50 or more *persons*, into not fewer than two *smoke compartments.* ~~The *smoke barrier* shall be in accordance with Section 709.~~

408.7 Security glazing.
In occupancies in Group I-3, windows and doors in 1-hour *fire barriers* ~~constructed in accordance with Section 707~~, *fire partitions*

~~constructed in accordance with Section 708~~ and *smoke barriers* ~~constructed in accordance with Section 709~~ shall be permitted to have security glazing installed provided that the following conditions are met.

1. Individual panels of glazing shall not exceed 1,296 square inches (0.84 m^2).
2. The glazing shall be protected on both sides by an *automatic sprinkler system*. The sprinkler system shall be designed to, when actuated, wet completely the entire surface of any glazing affected by fire.
3. The glazing shall be in a gasketed frame and installed in such a manner that the framing system will deflect without breaking (loading) the glass before the sprinkler system operates.
4. Obstructions, such as curtain rods, drapery traverse rods, curtains, drapes or similar materials shall not be installed between the automatic sprinklers and the glazing.

410.4.1 Separation from stage.
The *stage* shall be separated from dressing rooms, scene docks, property rooms, workshops, storerooms and compartments contiguous to the *stage* and other parts of the *building* by *fire barriers* ~~constructed in accordance with Section 707~~ or *horizontal assemblies* ~~constructed in accordance with Section 711~~, or both. The *fire-resistance rating* shall be not less than 2 hours for stage heights greater than 50 feet (15 240 mm) and not less than 1 hour for *stage* heights of 50 feet (15 240 mm) or less.

410.4.2 Separation from each other.
Dressing rooms, scene docks, property rooms, workshops, storerooms and compartments contiguous to the *stage* shall be separated from each other 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.

412.4.1 Fire separation.
A hangar shall not be attached to a *dwelling* unless separated by ~~a~~ not less than 1-hour *fire barriers* ~~*barrier* having a *fire-resistance rating* of not less than 1 hour~~. Such separation shall be continuous from the foundation to the underside of the roof and unpierced except for doors leading to the *dwelling unit*. Doors into the *dwelling unit* shall be equipped with *self-closing* devices and conform to the requirements of Section 716 with a noncombustible raised sill not less than 4 inches (102 mm) in height. Openings from a hangar directly into a room used for sleeping purposes shall not be permitted.

412.3.4 Heating equipment.
Heating equipment shall be placed in another room separated 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. Entrance shall be from the outside or by means of a vestibule providing a two-doorway separation.

Exceptions:

1. Unit heaters and vented infrared radiant heating equipment suspended not less than 10 feet (3048 mm) above the upper surface of wings or engine enclosures of the highest aircraft that are permitted to be housed in the hangar need not be located in a separate room provided that they are mounted not less than 8 feet (2438 mm) above the floor in shops, offices and other sections of the hangar communicating with storage or service areas.
2. Entrance to the separated room shall be permitted by a single interior door provided that the sources of ignition in the appliances are not less than 18 inches (457 mm) above the floor.

420.2 Separation walls.
Walls separating *dwelling units* in the same building, walls separating *sleeping units* in the same *building* , walls separating *dwelling units* from *sleeping units* in the same *building* and walls separating *dwelling* or *sleeping units* from other occupancies contiguous to them in the same building shall be constructed as *fire partitions* ~~in accordance with Section 708~~.

420.3 Horizontal separation.
Floor assemblies separating *dwelling units* in the same *buildings*, floor assemblies separating *sleeping units* in the same *building* , floor assemblies separating *dwelling units* from *sleeping units* in the same *building* and floor assemblies separating dwelling or *sleeping units* from other occupancies contiguous to them in the same *building* shall be constructed as *horizontal assemblies* ~~in accordance with~~

~~Section 711~~.

420.6 Smoke barriers in Group I-1, Condition 2.
Smoke barriers shall be provided in Group I-1, Condition 2 to subdivide every *story* used by *persons* receiving care, treatment or sleeping and to provide other *stories* with an *occupant load* of 50 or more *persons*, into not fewer than two *smoke compartments*. Such *stories* shall be divided into *smoke compartments* with an area of not more than 22,500 square feet (2092 m^2) and the distance of travel from any point in a *smoke compartment* to a *smoke barrier* door shall not exceed 200 feet (60 960 mm). ~~The *smoke barrier* shall be in accordance with Section 709.~~

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~~.

503.1 General.
Unless otherwise specifically modified in Chapter 4 and this chapter, *building height*, number of *stories* and *building area* shall not exceed the limits specified in Sections 504 and 506 based on the type of construction as determined by Section 602 and the occupancies as determined by Section 302 except as modified hereafter. *Building height*, number of *stories* and *building area* provisions shall be applied independently. For the purposes of determining area limitations, height limitations and type of construction, each portion of a building separated by one or more *fire walls* ~~complying with Section 706~~ shall be considered to be a separate building.

508.4.4.1 Construction.
Required separations shall be *fire barriers* ~~constructed in accordance with Section 707~~ or *horizontal assemblies* ~~constructed in accordance with Section 711~~, or both, so as to completely separate adjacent occupancies. *Mass timber* elements serving as *fire barriers* or *horizontal assemblies* to separate occupancies in Type IV-B or IV-C construction shall be separated from the interior of the *building* with an *approved* thermal barrier consisting of *gypsum board* that is not less than $^1/_2$ inch (12.7 mm) in thickness 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.

Exception: A thermal barrier shall not be required on the top of horizontal assemblies serving as occupancy separations.

509.4.1 Separation.
Where Table 509.1 specifies a fire-resistance-rated separation, the incidental uses shall be separated from the remainder of the *building* by ~~a *fire* barrier *barrier*~~ constructed in accordance with Section 707 or ~~a *horizontal* assemblies *assembly*~~ constructed in accordance with Section 711, or both. Construction supporting 1-hour *fire barriers* or *horizontal assemblies* used for incidental use separations in *buildings* of Type IIB, IIIB and VB construction is not required to be fire-resistance rated unless required by other sections of this code.

510.7.1 Fire separation.
Fire barriers ~~constructed in accordance with Section 707~~ or *horizontal assemblies* ~~constructed in accordance with Section 711~~ between the parking occupancy and the upper occupancy shall correspond to the required *fire-resistance rating* prescribed in Table 508.4 for the uses involved. The type of construction shall apply to each occupancy individually, except that structural members, including main bracing within the open parking *structure*, which is necessary to support the upper occupancy, shall be protected with the more restrictive fire-resistance-rated assemblies of the groups involved as shown in Table 601. *Means of egress* for the upper occupancy shall conform to Chapter 10 and shall be separated from the parking occupancy by not less than 2-hour *fire barriers* ~~having not less than a 2-hour *fire-resistance rating* as required by Section 707 with *self-closing* doors complying with Section 716~~ or *horizontal assemblies* ~~having not less than a 2-hour *fire-resistance rating* as required by Section 711~~, or both with *self-closing* doors complying with Section 716. *Means of egress* from the *open parking garage* shall comply with Section 406.5.

510.8 Group B or M buildings with Group S-2 open parking garage above.
Group B or M occupancies located below a Group S-2 *open parking garage* of a lesser type of construction shall be considered as a separate and distinct *building* from the Group S-2 *open parking garage* for the purpose of determining the type of construction where the following conditions are met:

1. The *buildings* are separated with a *horizontal assembly* having a *fire-resistance rating* of not less than 2 hours.

2. The occupancies in the *building* below the *horizontal assembly* are limited to Groups B and M.
3. The occupancy above the *horizontal assembly* is limited to a Group S-2 *open parking garage*.
4. The *building* below the *horizontal assembly* is of Type IA construction.

   Exception: The *building* below the *horizontal assembly* shall be permitted to be of Type IB or II construction, but not less than the type of construction required for the Group S-2 *open parking garage* above, where the *building* below is not greater than *one story* in height above *grade plane.*
5. The height and area of the *building* below the *horizontal assembly* does not exceed the limits set forth in Section 503.
6. The height and area of the Group S-2 *open parking garage* does not exceed the limits set forth in Section 406.5. The height, in both feet and *stories*, of the Group S-2 *open parking garage* shall be measured from *grade plane* and shall include the *building* below the *horizontal assembly*.
7. *Exits* serving the Group S-2 *open parking garage* ~~shall~~ discharge at grade with direct and unobstructed access to a street or *public way* and are separated from the *building* below the *horizontal assembly* by not less than 2-hour *fire barriers* ~~constructed in accordance with Section 707~~ or ~~2-hour~~ *horizontal assemblies* ~~constructed in accordance with Section 711~~, or both.

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. 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 *building official's* review and approval, the official 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.

713.2 Construction.
Shaft enclosures shall be constructed as *fire barriers* ~~in accordance with Section 707~~ or *horizontal assemblies* ~~in accordance with Section 711~~, or both.

713.5 Continuity.
Shaft enclosures shall be constructed as *fire barriers* ~~in accordance with Section 707~~ or *horizontal assemblies* ~~constructed in accordance with Section 711~~, or both, and shall have continuity in accordance with Section 707.5 for *fire barriers* or Section 711.2.2 for *horizontal assemblies*, as applicable.

713.11 Enclosure at the bottom.
Shafts that do not extend to the bottom of the *building* or *structure* shall comply with one of the following:
1. Be enclosed at the lowest level with construction of the same *fire-resistance rating* as the *lowest floor* through which the *shaft* passes, but not less than the rating required for the *shaft enclosure.*
2. Terminate in a room having a use related to the purpose of the *shaft*. The room shall be separated from the remainder of the *building* by *fire barriers* ~~constructed in accordance with Section 707~~ or *horizontal assemblies* ~~constructed in accordance with Section 711~~, or both. The *fire-resistance rating* and opening protectives shall be not less than the protection required for the *shaft enclosure*.
3. Be protected by *approved fire dampers* installed in accordance with their listing at the *lowest floor* level within the *shaft enclosure*.

Exceptions:

1. The fire-resistance-rated room separation is not required, provided that the only openings in or penetrations of the *shaft enclosure* to the interior of the *building* occur at the bottom. The bottom of the *shaft* shall be closed off around the penetrating items with materials permitted by Section 718.3.1 for *draftstops* , or the room shall be provided with an *approved automatic sprinkler system*.

2. A *shaft enclosure* containing a waste or linen chute shall not be used for any other purpose and shall discharge in a room protected in accordance with Section 713.13.4.

3. The fire-resistance-rated room separation and the protection at the bottom of the *shaft* are not required provided that there are no combustibles in the *shaft* and there are no openings or other penetrations through the *shaft enclosure* to the interior of the *building*.

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 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* based on the fire rating of the *shaft enclosure* in accordance with Tables 716.1(2) and 716.1(3) . 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 509.1.

901.7 Fire areas.
Where *buildings*, or portions thereof, are divided into *fire areas* so as not to exceed the limits established for requiring a *fire protection system* in accordance with this chapter, such *fire areas* shall be separated by *fire walls* ~~constructed in accordance with Section 706~~, *fire barriers* ~~constructed in accordance with Section 707~~, or *horizontal assemblies* ~~constructed in accordance with Section 711~~, or a combination thereof having a *fire-resistance rating* of not less than that determined in accordance with Section 707.3.10.

909.20.2 Construction.
The *smokeproof enclosure* shall be separated from the remainder of the *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. Openings are not permitted other than the required *means of egress* doors. The vestibule shall be separated from the *stairway* or *ramp* 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. The open exterior balcony shall be constructed in accordance with the *fire-resistance rating* requirements for floor assemblies.

909.20.6.1 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.

Exception:

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.

913.2.1 Protection of fire pump rooms.

Fire pumps shall be located in rooms that are separated from all other areas of the *building* by 2-hour *fire barriers* ~~constructed in accordance with Section 707~~ or ~~2-hour~~ *horizontal assemblies* ~~constructed in accordance with Section 711~~, or both.

Exceptions:

1. In other than *high-rise buildings*, separation by <u>not less than</u> 1-hour *fire barriers* ~~constructed in accordance with Section 707~~ or ~~1-hour~~ *horizontal assemblies* ~~constructed in accordance with Section 711~~, or both, shall be permitted in *buildings* equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1 or 903.3.1.2.
2. Separation is not required for fire pumps physically separated in accordance with NFPA 20.

1009.6.4 Separation.

Each *area of refuge* shall be separated from the remainder of the *story* by a *smoke barrier* ~~complying with Section 709~~ or a *horizontal exit* complying with Section 1026. Each *area of refuge* shall be designed to minimize the intrusion of smoke.

Exceptions:

1. *Areas of refuge* located within an enclosure for *interior exit stairways* complying with Section 1023.
2. *Areas of refuge* in outdoor *facilities* where *exit access* is essentially open to the outside.

1023.2 Construction.

Enclosures for interior exit *stairways* and *ramps* shall be constructed as *fire barriers* ~~in accordance with Section 707~~ or *horizontal assemblies* ~~constructed in accordance with Section 711~~, or both. *Interior exit stairway* and *ramp* 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 interior exit *stairways* or *ramps* shall include any *basements*, but not any *mezzanines*. Enclosures for interior *exit stairways* and *ramps* shall have a *fire-resistance rating* not less than the floor assembly penetrated, but need not exceed 2 hours.

Exceptions:

1. *Interior exit stairways* and *ramps* in Group I-3 occupancies in accordance with the provisions of Section 408.3.8.
2. *Interior exit stairways* within an *atrium* enclosed in accordance with Section 404.6.
3. *Interior exit stairways* in accordance with Section 510.2.

1023.3.1 Extension.

Where *interior exit stairways* and *ramps* are extended to an *exit discharge* or a *public way* by an *exit passageway*, the *interior exit stairway* and *ramp* shall be separated from the *exit passageway* by ~~a~~ *fire* <u>*barriers*</u> ~~*barrier* constructed in accordance with Section 707~~ or ~~a~~ *horizontal* <u>*assemblies*</u> ~~*assembly* constructed in accordance with Section 711~~, or both. The *fire-resistance rating* shall be not less than that required for the *interior exit stairway* and *ramp*. A *fire door assembly* complying with Section 716 shall be installed in the *fire barrier* to provide a *means of egress* from the *interior exit stairway* and *ramp* to the *exit passageway*. Openings in the *fire barrier* other than the *fire*

door assembly are prohibited. Penetrations of the *fire barrier* are prohibited.

Exceptions:

1. Penetrations of the *fire barrier* in accordance with Section 1023.5 shall be permitted.
2. Separation between an *interior exit stairway* or *ramp* and the *exit passageway* extension shall not be required where there are no openings into the *exit passageway* extension.
3. Separation between an *interior exit stairway* or *ramp* and the *exit passageway* extension shall not be required where the *interior exit stairway* and the *exit passageway* extension are pressurized in accordance with Section 909.20.4.

1023.12.1 Termination and extension.

A *smokeproof enclosure* shall terminate at an *exit discharge* or a *public way*. The *smokeproof enclosure* shall be permitted to be extended by an *exit passageway* in accordance with Section 1023.3. The *exit passageway* shall be without openings other than the *fire door assembly* required by Section 1023.3.1 and those necessary for egress from the *exit passageway*. The *exit passageway* shall be separated from the remainder of the *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.

Exceptions:

1. Openings in the *exit passageway* serving a *smokeproof enclosure* are permitted where the *exit passageway* is protected and pressurized in the same manner as the *smokeproof enclosure*, and openings are protected as required for access from other floors.
2. The *fire barrier* separating the *smokeproof enclosure* from the *exit passageway* is not required, provided that the *exit passageway* is protected and pressurized in the same manner as the *smokeproof enclosure*.
3. A *smokeproof enclosure* shall be permitted to egress through areas on the *level of exit discharge* or vestibules as permitted by Section 1028.

1024.3 Construction.

Exit passageway enclosures shall have walls, floors and ceilings of not less than a 1-hour *fire-resistance rating*, and not less than that required for any connecting *interior exit stairway* or *ramp*. Exit passageways shall be constructed as *fire barriers* ~~in accordance with Section 707~~ or *horizontal assemblies* ~~constructed in accordance with Section 711~~, or both.

1026.2 Separation. The separation between buildings or refuge areas connected by a *horizontal exit* shall be provided by ~~a *fire wall*, complying with Section 706; or by a *fire barrier* complying with Section 707 or a *horizontal assembly* complying with Section 711, or both~~ not less than 2-hour fire walls, fire barriers or horizontal assemblies, or a combination thereof. ~~The minimum *fire-resistance rating* of the separation shall be 2 hours.~~ Opening protectives in horizontal *exits* shall also comply with Section 716. Duct and air transfer openings in a *fire wall* or *fire barrier* that serves as a *horizontal exit* shall also comply with Section 717. The *horizontal exit* separation shall extend vertically through all levels of the building unless floor assemblies have a *fire-resistance rating* of not less than 2 hours and do not have unprotected openings.

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

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

1028.2 Exit discharge.

Exits shall discharge directly to the exterior of the *building*. The *exit discharge* shall be at grade or shall provide a direct path of egress travel to grade. The *exit discharge* shall not reenter a *building*. The combined use of Exceptions 1 and 2 shall not exceed 50 percent of the number and minimum width or required capacity of the required *exits*.

Exceptions:

1. Not more than 50 percent of the number and minimum width or required capacity of *interior exit stairways* and *ramps* is permitted to egress through areas, including *atriums*, on the level of discharge provided that all of the following conditions are met:
   1.1. Discharge of *interior exit stairways* and *ramps* shall be provided with a free and unobstructed path of travel to an exterior *exit* door and such *exit* is readily visible and identifiable from the point of termination of the enclosure.

   1.2. The entire area of the *level of exit discharge* is separated from areas below by construction conforming to the *fire-resistance rating* for the enclosure.

   1.3. The egress path from the *interior exit stairway* and *ramp* on the *level of exit discharge* is protected throughout by an *approved automatic sprinkler system*. Portions of the *level of exit discharge* with access to the egress path shall be either equipped throughout with an *automatic sprinkler system* installed in accordance with Section 903.3.1.1 or 903.3.1.2, or separated from the egress path in accordance with the requirements for the enclosure of *interior exit stairways* or *ramps*.

   1.4. Where a required *interior exit stairway* or *ramp* and an *exit access stairway* or *ramp* serve the same floor level and terminate at the same *level of exit discharge*, the termination of the *exit access stairway* or *ramp* and the *exit discharge* door of the *interior exit stairway* or *ramp* shall be separated by a distance of not less than 30 feet (9144 mm) or not less than one-fourth the length of the maximum overall diagonal dimension of the *building*, whichever is less. The distance shall be measured in a straight line between the *exit discharge* door from the *interior exit stairway* or *ramp* and the last tread of the *exit access stairway* or termination of slope of the *exit access ramp*.

2. Not more than 50 percent of the number and minimum width or required capacity of the *interior exit stairways* and *ramps* is permitted to egress through a vestibule provided that all of the following conditions are met:
   2.1. The entire area of the vestibule is separated from areas below by construction conforming to the *fire-resistance rating* of the *interior exit stairway* or *ramp enclosure*.

   2.2. The depth from the exterior of the *building* is not greater than 10 feet (3048 mm) and the length is not greater than 30 feet (9144 mm).

   2.3. The area is separated from the remainder of the *level of exit discharge* by a *fire partition* ~~constructed in accordance with Section 708~~.

      Exception: The maximum transmitted temperature rise is not required.

   2.4. The area is used only for *means of egress* and *exits* directly to the outside.

3. *Horizontal exits* complying with Section 1026 shall not be required to discharge directly to the exterior of the *building*.

1030.1.1.1 Spaces under grandstands and bleachers.

Spaces under *grandstands* or *bleachers* shall be separated by not less than 1-hour *fire barriers* ~~complying with Section 707 and~~ or *horizontal assemblies* ~~complying with Section 711 with not less than 1-hour *fire-resistance-rated* construction~~, or both.

Exceptions:

1. Ticket booths less than 100 square feet (9.29 m^2) in area.
2. Toilet rooms.
3. Other accessory use areas 1,000 square feet (92.9 m^2) or less in area and equipped with an *automatic sprinkler system* in accordance with Section 903.3.1.1.

3005.4 Machine rooms, control rooms, machinery spaces, and control spaces.

The following rooms and spaces shall be enclosed with *fire barriers* ~~constructed in accordance with Section 707~~ or *horizontal assemblies* ~~constructed in accordance with Section 711~~, or both:

1. Machine rooms.
2. Control rooms.
3. Control spaces.

4. Machinery spaces outside of the hoistway enclosure.

The *fire-resistance rating* shall be not less than the required rating of the hoistway enclosure served by the machinery. Openings in the *fire barriers* shall be protected with assemblies having a *fire protection rating* not less than that required for the hoistway enclosure doors.

Exceptions:

1. For other than fire service access elevators and occupant evacuation elevators, where machine rooms, machinery spaces, control rooms and control spaces do not abut and do not have openings to the hoistway enclosure they serve, the *fire barriers* ~~constructed in accordance with Section 707~~ or *horizontal assemblies* ~~constructed in accordance with Section 711~~, or both, shall be permitted to be reduced to a 1-hour *fire-resistance rating*.
2. For other than fire service access elevators and occupant evacuation elevators, in *buildings* four *stories* or less above *grade plane* where machine room, machinery spaces, control rooms and control spaces do not abut and do not have openings to the hoistway enclosure they serve, the machine room, machinery spaces, control rooms and control spaces are not required to be fire-resistance rated.

3006.3 Elevator hoistway door protection.

Where Section 3006.2 requires protection of the elevator hoistway doors, the protection shall be provided by one of the following:

1. An enclosed elevator lobby shall be provided at each floor to separate the elevator hoistway doors from each floor with *fire partitions* ~~in accordance with Section 708~~. In addition, doors protecting openings in the fire partitions shall comply with Section 716.2.2.1. Penetrations of the fire partitions by ducts and air transfer openings shall be protected as required for *corridors* in accordance with Section 717.5.4.1.
2. An enclosed elevator lobby shall be provided at each floor to separate the elevator hoistway doors from each floor by *smoke partitions* ~~in accordance with Section 710~~. In addition, doors protecting openings in the *smoke partitions* shall comply with Sections 710.5.2.2, 710.5.2.3 and 716.2.6.1. Penetrations of the *smoke partitions* by ducts and air transfer openings shall be protected as required for *corridors* in accordance with Section 717.5.4.1.
3. Additional doors or other devices shall be provided at each elevator hoistway door in accordance with Section 3002.6. Such doors or other devices shall comply with the smoke and draft control door assembly requirements in Section 716.2.2.1.1 when tested in accordance with UL 1784 without an artificial bottom seal.
4. The elevator hoistway shall be pressurized in accordance with Section 909.21.
5. A *smoke-protective curtain assembly for hoistways* shall be provided at each elevator hoistway door opening in accordance with Section 3002.6. Such curtain assemblies shall comply with the smoke and draft control requirements in Section 716.2.2.1.1 when tested in accordance with UL 1784 without an artificial bottom seal. Such curtain assemblies shall be equipped with a control unit *listed* to UL 864. Such curtain assemblies shall comply with Section 2.11.6.3 of ASME A17.1/CSA B44. Installation and maintenance shall be in accordance with NFPA 105.

3104.5.1 Fire barriers.

Pedestrian walkways shall be separated from the interior of the *building* by not less than 2-hour *fire barriers* constructed in accordance with ~~Section~~ Sections 707 and ~~Sections~~ 3104.5.1.1 through 3104.5.1.3.

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Revise as follows:

[BF] 909.20.2 Construction.

The *smokeproof enclosure* shall be separated from the remainder of the building by not less than 2-hour *fire barriers* ~~constructed in accordance with Section 707 of the *International Building Code*~~ or *horizontal assemblies* ~~constructed in accordance with Section 711 of the *International Building Code*~~, or both. Openings are not permitted other than the required *means of egress* doors. The vestibule shall be separated from the *stairway* or *ramp* by not less than 2-hour *fire barriers* ~~constructed in accordance with Section 707 of the *International Building Code*~~ or *horizontal assemblies* ~~constructed in accordance with Section 711 of the *International Building Code*~~, or both. The open exterior balcony shall be constructed in accordance with the *fire-resistance-rating* requirements for floor assemblies.

[BF] 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 of the *International Building Code*~~ or *horizontal assemblies* ~~constructed in accordance with Section 711 of the *International Building Code*~~, 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 of the *International Building Code*~~ or *horizontal assemblies* ~~constructed in accordance with Section 711 of the *International Building Code*~~, 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 of the *International Building Code*~~ or *horizontal assemblies* ~~constructed in accordance with Section 711 of the *International Building Code*~~, or both.

Exception: 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. 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.
2. Where encased with not less than 2 inches (51 mm) of concrete.
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.

[BE] 1023.2 Construction.

Enclosures for *interior exit stairways* and *ramps* shall be constructed as *fire barriers* ~~in accordance with Section 707 of the International Building Code~~ or *horizontal assemblies* ~~constructed in accordance with Section 711 of the International Building Code,~~ or both. *Interior exit stairway* and *ramp* 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 *interior exit stairways* or *ramps* shall include any *basements*, but not any *mezzanines*. Enclosure for *interior exit stairways* and *ramps* shall have a *fire-resistance rating* not less than the floor assembly penetrated, but need not exceed 2 hours.

Exceptions:

1. *Interior exit stairways* and *ramps* in Group I-3 occupancies in accordance with the provisions of Section 408.3.8 of the International Building Code.
2. *Interior exit stairways* within an atrium enclosed in accordance with Section 404.6 of the International Building Code.
3. *Interior exit stairways* in accordance with Section 510.2 of the *International Building Code*.

[BE] 1023.3.1 Extension. Where *interior exit stairways* and *ramps* are extended to an *exit discharge* or a *public way* by an *exit passageway*, the *interior exit stairway* and *ramp* shall be separated from the *exit passageway* by ~~a~~ *fire barriers* ~~constructed in accordance with Section 707 of the International Building Code~~ or ~~a~~ *horizontal assemblies* ~~*assembly* constructed in accordance with Section 711 of the International Building Code,~~ or both. The *fire-resistance rating* shall be not less than that required for the *interior exit stairway* and *ramp*. A *fire door* assembly complying with Section 716 of the International Building Code shall be installed in the *fire barrier* to provide a *means of egress* from the *interior exit stairway* and *ramp* to the *exit passageway*. Openings in the *fire barrier* other than the *fire door* assembly are prohibited. Penetrations of the *fire barrier* are prohibited.

Exceptions:

1. Penetrations of the *fire barrier* in accordance with Section 1023.5 shall be permitted.
2. Separation between an *interior exit stairway* or *ramp* and the *exit passageway* extension shall not be required where there are no openings into the *exit passageway* extension.

3. Separation between an *interior exit stairway* or *ramp* and the *exit passageway* extension shall not be required where the *interior exit stairway* and the *exit passageway* extension are pressurized in accordance with Section 909.20.4 of the International Building Code.

[BE] 1023.12.1 Termination and extension. A *smokeproof enclosure* shall terminate at an *exit discharge* or a *public way*. The *smokeproof enclosure* shall be permitted to be extended by an *exit passageway* in accordance with Section 1023.3. The *exit passageway* shall be without openings other than the *fire door assembly* required by Section 1023.3.1 and those necessary for egress from the *exit passageway*. The *exit passageway* shall be separated from the remainder of the building by not less than 2-hour *fire barriers* ~~constructed in accordance with Section 707 of the International Building Code~~ or *horizontal assemblies* ~~constructed in accordance with Section 711 of the International Building Code,~~ or both.

Exceptions:

1. Openings in the *exit passageway* serving a *smokeproof enclosure* are permitted where the *exit passageway* is protected and pressurized in the same manner as the *smokeproof enclosure*, and openings are protected as required for access from other floors.
2. The *fire barrier* separating the *smokeproof enclosure* from the *exit passageway* is not required, provided that the *exit passageway* is protected and pressurized in the same manner as the *smokeproof enclosure*.
3. A *smokeproof enclosure* shall be permitted to egress through areas on the *level of exit discharge* or vestibules as permitted by Section 1028.

[BE] 1026.2 Separation. The separation between buildings or refuge areas connected by a *horizontal exit* shall be provided by ~~a *fire wall* complying with Section 706 of the International Building Code; or by a *fire barrier* complying with Section 707 of the International Building Code or a *horizontal assembly* complying with Section 711 of the International Building Code, or both.~~ not less than 2-hour fire walls, fire barriers or horizontal assemblies, or a combination thereof. ~~The minimum *fire-resistance rating* of the separation shall be 2 hours.~~ Opening protectives in *horizontal exits* shall also comply with Section 716 of the International Building Code. Duct and air transfer openings in a *fire wall* or *fire barrier* that serves as a *horizontal exit* shall also comply with Section 717 of the International Building Code. The *horizontal exit* separation shall extend vertically through all levels of the building unless floor assemblies have a *fire-resistance rating* of not less than 2 hours and do not have unprotected openings.

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

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

[BE] 1028.2 Exit discharge.

Exits shall discharge directly to the exterior of the building. The *exit discharge* shall be at grade or shall provide a direct path of egress travel to grade. The *exit discharge* shall not reenter a building. The combined use of Exceptions 1 and 2 shall not exceed 50 percent of the number and minimum width or required capacity of the required *exits*.

Exceptions:

1. Not more than 50 percent of the number and minimum width or required capacity of *interior exit stairways* and *ramps* is permitted to egress through areas, including atriums, on the *level of discharge* provided that all of the following conditions are met:
   1.1. Discharge of *interior exit stairways* and *ramps* shall be provided with a free and unobstructed path of travel to an exterior exit door and such *exit* is readily visible and identifiable from the point of termination of the enclosure.
   1.2. The entire area of the *level of exit discharge* is separated from areas below by construction conforming to the *fire-resistance rating* for the enclosure.
   1.3. The egress path from the *interior exit stairway* and *ramp* on the *level of exit discharge* is protected throughout by an *approved automatic sprinkler system*. Portions of the *level of exit discharge* with access to the egress path shall either be equipped throughout with an *automatic sprinkler system* installed in accordance with Section 903.3.1.1 or 903.3.1.2, or separated from the egress path in accordance with the requirements for the enclosure of *interior exit stairways* or *ramps*.
   1.4. Where a required *interior exit stairway* or *ramp* and an *exit access stairway* or *ramp* serve the same floor level and terminate at the same *level of exit discharge*, the termination of the *exit access stairway* or *ramp* and the exit discharge door of the *interior exit stairway* or *ramp* shall be separated by a distance of not less than 30 feet (9144 mm) or not less than one-fourth the length of the maximum overall diagonal dimension of the building, whichever is less. The distance shall be measured in a straight line between the exit discharge door from the *interior exit stairway* or *ramp* and the last tread of the *exit access stairway* or termination of slope of the *exit access ramp*.

2. Not more than 50 percent of the number and minimum width or required capacity of the *interior exit stairways* and *ramps* is permitted to egress through a vestibule provided that all of the following conditions are met:
   2.1. The entire area of the vestibule is separated from areas below by construction conforming to the *fire-resistance rating* of the *interior exit stairway* or *ramp* enclosure.
   2.2. The depth from the exterior of the building is not greater than 10 feet (3048 mm) and the length is not greater than 30 feet (9144 mm).
   2.3. The area is separated from the remainder of the *level of exit discharge* by a *fire partition* ~~constructed in accordance with Section 708 of the International Building Code~~.

      Exception: The maximum transmitted temperature rise is not required.

   2.4. The area is used only for *means of egress* and *exits* directly to the outside.

3. *Horizontal exits* complying with Section 1026 shall not be required to discharge directly to the exterior of the building.

[BE] 1030.1.1.1 Spaces under grandstands and bleachers. Spaces under *grandstands* or *bleachers* shall be separated by <u>not less than 1-hour</u> *fire barriers* ~~complying with Section 707 of the International Building Code~~ and *horizontal assemblies* ~~complying with Section 711 of the International Building Code with not less than 1-hour~~ *~~fire-resistance-rated~~* ~~construction~~ <u>, or both .</u>

Exceptions:

1. Ticket booths less than 100 square feet (9 m^2) in area.
2. Toilet rooms.
3. Other accessory use areas 1,000 square feet (93 m^2) or less in area and equipped with an *automatic sprinkler system* in accordance with Section 903.3.1.1.

Reason: This proposal is designed to provide consistency with references to fire-resistance-rated construction requirements. The 2024 IBC makes multiple requirements for fire walls, fire barriers, fire partitions, smoke barriers, and smoke partitions. The format of the requirements is not consistent, but more importantly, there is really no need to reference the section regulating these components every

time a requirement is made. These terms are all defined terms and each component has a specific section that it must comply with. Where Section 426.1.7 requires a tire buffing room to be separated from the remainder of the building by 1-hour fire barriers, it is understood that the fire barrier must comply with the code. If the fire barrier does not comply with the code, it is not a fire barrier.

For example, the IBC does not state provide “exit doors in accordance with Section 1010” every time an exit door is required. Such language is not necessary and the code does not need to state it, because if the door does not comply then it is not considered an exit door.

Currently, the IBC does not reference the specific sections in the following locations:
404.6, 407.5.4, 408.6.1, 412.4.1, 415.9.1.2, 415.11.1.6, 415.11.7.4, 420.6, 426.1.7, 507.9, 510.2, 510.5, 510.6, 707.3.10, 714.4, 714.5.4, 717.5.1.1, 909.6, 909.6.2, 909.18.6, 910.3.2, 911.1.6, 1026.2, 3007.6.2, 3008.6.2
None of these sections refer back to Chapter 7, but they all seem to work effectively without that reference.

This proposal intends to eliminate the multiple phrases “constructed in accordance with Section 70X” because they are not needed, and are basically redundant. The code proves that they are not needed by the number of references where the section for construction is not included.

Even where a section in Chapter 7 is referenced, a number of references are worded differently. Some of those sections include:

- **402.4.2.2** Anchor building separation. …fire walls complying with Section 706.
- **420.2** Separation walls. …fire partitions in accordance with Section 708
- **422.2** Separation walls. …fire partitions installed in accordance with Section 708
- **716.3.2.1.1** Where 3/4-hour-fire-protection window assemblies permitted. …fire partitions designed in accordance with Section 708
- **1026.2** Separation. …fire wall complying with Section 706; or by a fire barrier complying with Section 707 or a horizontal assembly complying with Section 711, or both.

This code change is editorial and makes no change in code application. This proposal simplifies the code language and provides consistency in the requirements for fire walls, fire barriers, smoke barriers, etc.

Cost Impact: The change proposal is editorial in nature or a clarification and has no cost impact on the cost of construction

Justification for no cost impact:

This proposal is long, but it is entirely editorial. There is no change in code application or code requirements.

FS21-24 Part I

FS21-24 Part II

IFC: SECTION 702, 702.1, 702.1 (New), 508.1.2, 605.4.2.6, 901.4.4, 903.2, 909.11.1, 910.4.5, 914.3.1, 914.4.1, 914.8.3.2, 1207.7.4, 2311.8.3, 2404.4, 2703.14.2, 3206.3.2, 3207.2, 3208.2, 3704.3, 3704.4, 3704.5, 3804.1.1.1, TABLE 5003.1.1(5), 5003.8.3.1, 5003.8.3.3, 5306.2.1, 5306.2.2, 5906.4.2, 6306.4, 6404.1.4; IBC: [F] 403.3, [F] 403.4.8.1, [F] 404.3, [F] 412.3.6.2, [F] 414.2.1, [F] 414.2.3, [F] 415.10.2, [F] 415.10.4, [F] 415.11.1.2, [F] 415.11.1.6, [F] 415.11.6.1, [F] 415.11.6.2, [F] 416.2, [F] 418.4, [F] 418.5, [F] 418.6, [F] 426.1.2, [F] 427.2.1, [F] 427.2.2, [F] 428.3.1, [F] 903.2, [F] 909.11.1, [F] 910.4.5, [F] 911.1.2

Proponents: Kevin Scott, KH Scott & Associates LLC, self (khscottassoc@gmail.com)

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE FIRE SAFETY CODE COMMITTEE. PART II WILL BE HEARD BY THE FIRE CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THESE COMMITTEES.

2024 International Fire Code

Revise as follows:

SECTION 702
~~DEFINITIONS~~ RATED CONSTRUCTION

Delete without substitution:

~~**702.1 Definitions.**~~
~~The following terms are defined in Chapter 2:~~
~~**DRAFTSTOP.**~~

~~**FIREBLOCKING.**~~

~~**MEMBRANE-PENETRATION FIRESTOP SYSTEM.**~~

~~**OPENING PROTECTIVE.**~~

~~**SMOKE BARRIER.**~~

~~**SMOKE PARTITION.**~~

~~**THROUGH-PENETRATION FIRESTOP SYSTEM.**~~

Add new text as follows:

702.1 Construction requirements. Fire-resistance-rated construction and smoke-limiting construction required by this code shall comply with the following:

1. Fire walls shall be constructed in accordance with Section 706 of the *International Building Code*.
2. Fire barriers shall be constructed in accordance with Section 707 of the *International Building Code*.
3. Fire partitions shall be constructed in accordance with Section 708 of the *International Building Code*.
4. Smoke barriers shall be constructed in accordance with Section 709 of the *International Building Code*.
5. Smoke partitions shall be constructed in accordance with Section 710 of the *International Building Code*.
6. Horizontal assemblies shall be constructed in accordance with Section 711 of the *International Building Code*.

Revise as follows:

508.1.2 Separation.

The *fire command center* shall be separated from the remainder of the building by not less than a 1-hour ~~*fire barrier* constructed in accordance with Section 707 of the International Building Code or *horizontal assembly* constructed in accordance with Section 711 of the International Building Code~~fire barriers or horizontal assemblies, or both.

605.4.2.6 Separation.
Rooms containing fuel oil tanks for internal combustion engines shall be separated from the remainder of the building by not less than 1-hour *fire barriers, horizontal assemblies*, or both, ~~with a minimum 1-hour *fire-resistance rating*~~ with 1-hour fire-protection-rated *opening protectives* ~~constructed in accordance with the *International Building Code*~~.

Exception: Rooms containing protected above-ground tanks complying with Section 5704.2.9.7 shall not be required to be separated from surrounding areas.

901.4.4 Fire areas.
Where buildings, or portions thereof, are divided into *fire areas* so as not to exceed the limits established for requiring a *fire protection system* in accordance with this chapter, such *fire areas* shall be separated by *fire barriers* ~~constructed in accordance with Section 707 of the International Building Code~~ or *horizontal assemblies* ~~constructed in accordance with Section 711 of the International Building Code~~, or both, having a *fire-resistance rating* of not less than that determined in accordance with Section 707.3.10 of the International Building Code.

903.2 Where required.
Approved automatic sprinkler systems in new buildings and structures shall be provided in the locations described in Sections 903.2.1 through 903.2.12.

Exception: Spaces or areas in telecommunications buildings used exclusively for telecommunications equipment, associated electrical power distribution equipment, batteries not required to have an *automatic sprinkler system* by Section 1207 for energy storage systems and standby engines, provided that those spaces or areas are equipped throughout with an *automatic smoke detection system* in accordance with Section 907.2 and are separated from the remainder of the building by not less than 1-hour *fire barriers* ~~constructed in accordance with Section 707 of the International Building Code~~ or not less than 2-hour *horizontal assemblies* ~~constructed in accordance with Section 711 of the International Building Code~~, or both.

909.11.1 Equipment room.
The standby power source and its transfer switches shall be in a room separate from the normal power transformers and switch gears and ventilated directly to and from the exterior. The room shall be enclosed with not less than 1-hour *fire barriers* ~~constructed in accordance with Section 707 of the International Building Code~~ or *horizontal assemblies* ~~constructed in accordance with Section 711 of the International Building Code~~, or both.

910.4.5 Manual control location.
Manual controls shall be located where they are able to be accessed by the fire service from an exterior door of the building and separated from the remainder of the building by not less than 1-hour *fire barriers* ~~constructed in accordance with Section 707 of the International Building Code~~ or *horizontal assemblies* ~~constructed in accordance with Section 711 of the International Building Code~~, or both.

914.3.1 Automatic sprinkler system.
Buildings and structures shall be equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1 and a secondary water supply where required by Section 914.3.2.

Exception: An *automatic sprinkler system* shall not be required in spaces or areas of telecommunications equipment buildings used exclusively for telecommunications equipment, associated electrical power distribution equipment, batteries and standby engines, provided that those spaces or areas are equipped throughout with an automatic fire detection system in accordance with Section 907.2 and are separated from the remainder of the building by not less than 1-hour *fire barriers* ~~constructed in accordance with Section 707 of the *International Building Code*~~ or not less than 2-hour *horizontal assemblies* ~~constructed in accordance with Section 711 of the *International Building Code*~~, or both.

914.4.1 Automatic sprinkler system.

An *approved automatic sprinkler system* shall be installed throughout the entire building.

Exceptions:

1. That area of a building adjacent to or above the atrium need not be sprinklered, provided that portion of the building is separated from the atrium portion by not less than a 2-hour *fire barrier* ~~constructed in accordance with Section 707 of the International Building Code~~ or *horizontal assemblies* ~~constructed in accordance with Section 711 of the International Building Code~~, or both.
2. Where the ceiling of the atrium is more than 55 feet (16 764 mm) above the floor, sprinkler protection at the ceiling of the atrium is not required.

914.8.3.2 Separation of maximum single fire areas.

Maximum single *fire areas* established in accordance with hangar classification and construction type in Table 914.8.3 shall be separated by not less than 2-hour *fire walls* ~~constructed in accordance with Section 706 of the International Building Code~~. In determining the maximum single *fire area* as set forth in Table 914.8.3, ancillary uses that are separated from aircraft servicing areas by not less than a 1-hour *fire barrier* ~~constructed in accordance with Section 707 of the International Building Code~~ shall not be included in the area.

1207.7.4 Fire-resistance-rated separations.

Rooms and areas containing ESS shall include *fire-resistance-rated* separations as follows:

1. In dedicated-use buildings, rooms and areas containing ESS shall be separated from areas in which administrative and support personnel are located.
2. In nondedicated-use buildings, rooms and areas containing ESS shall be separated from other areas in the building.

Separation shall be provided by 2-hour *fire barriers* ~~constructed in accordance with Section 707 of the *International Building Code* and 2-hour~~ or *horizontal assemblies* ~~constructed in accordance with Section 711 of the *International Building Code*, as appropriate~~or both. (Material based on NFPA 855 2023 Ed.)

2311.8.3 Motor vehicle repair rooms.

Motor vehicle repair rooms shall be enclosed ~~with~~ by not less than 1-hour *fire barriers* ~~constructed in accordance with Section 707 of the International Building Code,~~ or *horizontal assemblies* ~~constructed in accordance with Section 711 of the International Building Code~~, or both, with 1-hour-rated opening protectives.

2404.4 Location of spray-finishing operations.

Spray-finishing operations conducted in buildings used for Group A, E, I or R occupancies shall be located in a spray room protected with an *approved automatic sprinkler system* installed in accordance with Section 903.3.1.1 and separated ~~vertically and horizontally~~ from the remainder of the building by not less than 1-hour fire barriers ~~*fire barrier* walls and~~ or *horizontal assemblies* ~~with not less than a 1-hour *fire-resistance rating* in accordance with the *International Building Code*, or both~~. In other occupancies, spray-finishing operations shall be conducted in a spray room, spray booth or limited spraying space *approved* for such use.

Exceptions:

1. Automobile undercoating spray operations and spray-on automotive lining operations conducted in areas with *approved* natural or mechanical ventilation shall be exempt from the provisions of Section 2404 when *approved* and where utilizing Class IIIA or IIIB *combustible liquids*.
2. In buildings other than Group A, E, I or R occupancies, *approved* limited spraying space in accordance with Section 2404.11.
3. Resin application areas used for manufacturing of reinforced plastics complying with Section 2409 shall not be required to be located in a spray room, spray booth or spraying space.

2703.14.2 Penetrations.

Exhaust ducts penetrating *fire barriers* ~~constructed in accordance with Section 707 of the International Building Code~~ or *horizontal assemblies* ~~constructed in accordance with Section 711 of the International Building Code~~ shall be contained in a shaft of equivalent *fire-resistance-rated* construction. Exhaust ducts shall not penetrate *fire walls*. *Fire dampers* shall not be installed in exhaust ducts.

3206.3.2 Multiple high-piled storage areas.
Where a building contains multiple *high-piled storage areas*, the aggregate of all *high-piled storage areas* shall be used for the application of Table 3206.2 unless the *high-piled storage areas* are separated in accordance with one of the following:

1. *High-piled storage areas* separated by not less than 1-hour *fire barriers* ~~with a minimum *fire-resistance rating* of 1 hour constructed in accordance with Section 707 of the International Building Code~~.
2. In buildings equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1, *high-piled storage areas* separated by 100 feet (30 480 mm) or more. The area providing the separation shall not contain *high-piled combustible storage*.

3207.2 Fire protection.
Where automatic sprinklers are required by Table 3206.2, an *approved automatic sprinkler system* shall be installed throughout the building or to not less than 1-hour *fire barriers* ~~constructed in accordance with Section 707 of the International Building Code~~with 1-hour-rated opening protectives. ~~Openings in such *fire barriers* shall be protected by opening protectives having a 1-hour *fire protection rating*.~~ The design and installation of the *automatic sprinkler system* and other applicable fire protection shall be in accordance with the *International Building Code* and NFPA 13.

3208.2 Fire protection.
Where automatic sprinklers are required by Table 3206.2, an *approved automatic sprinkler system* shall be installed throughout the building or to not less than 1-hour *fire barriers* ~~constructed in accordance with Section 707 of the International Building Code~~with 1-hour-rated opening protectives. ~~Openings in such *fire barriers* shall be protected by opening protectives having a 1-hour *fire protection rating*.~~ The design and installation of the *automatic sprinkler system* and other applicable fire protection shall be in accordance with Section 903.3.1.1 and the *International Building Code*.

3704.3 Storage of more than 100 cubic feet to 500 cubic feet.
Loose *combustible fibers* in quantities exceeding 100 cubic feet (3 m^3) but not exceeding 500 cubic feet (14 m^3) shall be stored in rooms enclosed ~~with~~ by not less than 1-hour *fire barriers* ~~constructed in accordance with Section 707 of the International Building Code~~ or *horizontal assemblies* ~~constructed in accordance with Section 711 of the International Building Code~~, or both~~, with openings protected by an *approved* opening protective assembly having a *fire protection rating* of 3/4 hour in accordance with the *International Building Code*~~.

3704.4 Storage of more than 500 cubic feet to 1,000 cubic feet.
Loose *combustible fibers* in quantities exceeding 500 cubic feet (14 m^3) but not exceeding 1,000 cubic feet (28 m^3) shall be stored in rooms enclosed ~~with~~ by not less than 2-hour *fire barriers* ~~constructed in accordance with Section 707 of the International Building Code~~ or *horizontal assemblies* ~~constructed in accordance with Section 711 of the International Building Code~~, or both~~, openings protected by an *approved* opening protective assembly having a *fire protection rating* of 1 1/2 hours in accordance with the *International Building Code*~~.

3704.5 Storage of more than 1,000 cubic feet.
Loose *combustible fibers* in quantities exceeding 1,000 cubic feet (28 m^3) shall be stored in rooms enclosed ~~with~~by not less than 2-hour *fire barriers* ~~constructed in accordance with Section 707 of the International Building Code~~ or *horizontal assemblies* ~~constructed in accordance with Section 711 of the International Building Code~~, or both~~, with openings protected by an *approved* opening protective assembly having a *fire protection rating* of 1 1/2 hours in accordance with the *International Building Code*.~~ The storage room shall be protected by an *automatic sprinkler system* installed in accordance with Section 903.3.1.1.

3804.1.1.1 Separation from other nonlaboratory areas. *Laboratory suites* shall be separated from other portions of the building in accordance with the most restrictive of the following:

1. *Fire barriers* and *horizontal assemblies* as required in Table 3804.1.1. ~~*Fire barriers* shall be constructed in accordance with Section 707 of the International Building Code and *horizontal assemblies* shall be constructed in accordance with Section 711 of the International Building Code.~~

   Exception: Where an individual *laboratory suite* occupies more than one story, the *fire-resistance rating* of intermediate floors contained within the *laboratory suite* shall comply with the requirements of the *International Building Code*.

2. Separations as required in Section 508 of the International Building Code.

TABLE 5003.1.1(5) HAZARDOUS MATERIALS EXEMPTIONS[a]

MATERIAL CLASSIFICATION	OCCUPANCY OR APPLICATION	EXEMPTION
Combustible fiber	Baled cotton	Densely packed baled cotton shall not be classified as combustible fiber, provided that the bales comply with the packing requirements of ISO 8115.
Corrosive	Building materials	The quantity of commonly used building materials that are classified as corrosive materials is not limited.
	Personal and household products	The quantity of personal and household products that are classified as corrosive materials is not limited in retail displays, provided that the products are in original packaging.
	Retail and wholesale sales occupancies	The quantity of medicines, foodstuffs or consumer products, and cosmetics containing not more than 50 percent by volume of water-miscible liquids, with the remainder of the solutions not being flammable, is not limited. To qualify for this allowance, such materials shall be packaged in individual containers not exceeding 1.3 gallons.
Explosives	Groups B, F, M and S	Storage of special industrial explosive devices is not limited.
	Groups M and R-3	Storage of black powder, smokeless propellant, and small arms primers is not limited.
Flammable and combustible liquids and gases	Aerosols	Buildings and structures occupied for the storage of aerosol products, aerosol cooking spray products, or plastic aerosol 3 products shall be classified as Group S-1.
	Alcoholic beverages	The quantity of alcoholic beverages in liquor stores and distributors without bulk storage is not limited.
		The quantity of alcoholic beverages in distilling or brewing of beverages is not limited.
		The storage quantity of beer, distilled spirits and wines in barrels and casks is not limited.
		The quantity of alcoholic beverages in retail and wholesale sales occupancies is not limited. To qualify for this allowance, beverages shall be packaged in individual containers not exceeding 1.3 gallons.
	Cleaning establishments with combustible liquid solvents	The quantity of combustible liquid solvents used in closed systems and having a flash point at or above 140°F is not limited. To qualify for this allowance, equipment shall be listed by an approved testing agency and the occupancy shall be separated from all other areas of the building by 1-hour fire barriers or ~~1-hour~~ horizontal assemblies, or both~~, constructed in accordance with the *International Building Code*~~.
		The quantity of combustible liquid solvents having a flash point at or above 200°F is not limited.
	Closed piping systems	The quantity of flammable and combustible liquids and gases utilized for the operation of machinery or equipment is not limited.
	Flammable finishing operations using flammable and combustible liquids	Buildings and structures occupied for the application of flammable finishes shall comply with Section 416.
	Fuel	The quantity of liquid or gaseous fuel in fuel tanks on vehicles or motorized equipment is not limited.
		The quantity of gaseous fuels in piping systems and fixed appliances regulated by the *International Fuel Gas Code* is not limited.
		The quantity of liquid fuels in piping systems and fixed appliances regulated by the *International Mechanical Code* is not limited.
	Fuel oil	The quantity of fuel oil storage complying with Section 605.4.2 is not limited.
	Hand sanitizer	The quantity of alcohol-based hand rubs (ABHR) classified as Class I or II liquids in dispensers installed in accordance with Sections 5705.5 and 5705.5.1 is not limited. The location of the ABHR shall be provided in the construction documents.
	Retail and wholesale sales occupancies with flammable and combustible liquids	The quantity of medicines, foodstuffs or consumer products, and cosmetics containing not more than 50 percent by volume of water-miscible liquids, with the remainder of the solutions not being flammable, is not limited. To qualify for this allowance, such materials shall be packaged in individual containers not exceeding 1.3 gallons.
Highly toxic and toxic materials	Retail and wholesale sales occupancies	The quantity of medicines, foodstuffs or consumer products, and cosmetics containing not more than 50 percent by volume of water-miscible liquids, with the remainder of the solutions not being flammable, is not limited. To qualify for this allowance, such materials shall be packaged in individual containers not exceeding 1.3 gallons.
Any	Agricultural materials	The quantity of agricultural materials stored or utilized for agricultural purposes on the premises is not limited.
	Energy storage	The quantity of hazardous materials in stationary storage battery systems is not limited.
		The quantity of hazardous materials in stationary fuel cell power systems is not limited.
		The quantity of hazardous materials in capacitor energy storage systems is not limited.

	Refrigeration systems	The quantity of refrigerants in refrigeration systems is not limited.

For SI: 1 gallon = 3.785 L, °C = (°F – 32)/1.8.

a. Exempted materials and conditions listed in this table are required to comply with provisions of this code that are not based on exceeding maximum allowable quantities in Section 5003.

5003.8.3.1 Construction requirements.

Control areas shall be separated from each other by *fire barriers* ~~constructed in accordance with Section 707 of the International Building Code~~ or *horizontal assemblies* ~~constructed in accordance with Section 711 of the International Building Code~~, or both.

5003.8.3.3 Number.

The maximum number of *control areas* per floor within a building shall be in accordance with Table 5003.8.3.2. For the purposes of determining the number of *control areas* within a building, each portion of a building separated by one or more *fire walls* ~~complying with Section 706 of the *International Building Code*~~ shall be considered a separate building.

5306.2.1 One-hour exterior rooms.

A 1-hour exterior room shall be a room or enclosure separated from the remainder of the building by not less than 1-hour *fire barriers* ~~constructed in accordance with Section 707 of the International Building Code~~ or *horizontal assemblies* ~~constructed in accordance with Section 711 of the International Building Code~~, or both~~, with a *fire resistance rating* of not less than 1 hour~~. Openings between the room or enclosure and interior spaces shall be self-closing smoke- and draft-control assemblies having a *fire protection rating* of not less than 1 hour. Rooms shall have not less than one *exterior wall* that is provided with not less than two vents. Each vent shall have a minimum free opening area of 36 square inches (232 cm^2) for each 1,000 cubic feet (28 m^3) at *normal temperature and pressure* (NTP) of gas stored in the room and shall be not less than 72 square inches (465 cm^2) in aggregate free opening area. One vent shall be within 6 inches (152 mm) of the floor and one shall be within 6 inches (152 mm) of the ceiling. Rooms shall be provided with not less than one automatic sprinkler to provide container cooling in case of fire.

5306.2.2 One-hour interior room.

Where an exterior wall cannot be provided for the room, a 1-hour interior room shall be provided and shall be a room or enclosure separated from the remainder of the building by not less than 1-hour *fire barriers* ~~constructed in accordance with Section 707 of the International Building Code~~ or *horizontal assemblies* ~~constructed in accordance with Section 711 of the International Building Code~~, or both~~, with a *fire resistance rating* of not less than 1 hour~~. Openings between the room or enclosure and interior spaces shall be provided with self-closing, smoke- and draft-control assemblies having a *fire protection rating* of not less than 1 hour. An *automatic sprinkler system* shall be installed within the room. The room shall be exhausted through a duct to the exterior. Supply and exhaust ducts shall be enclosed in a 1-hour-rated shaft enclosure from the room to the exterior. *Approved* mechanical ventilation shall comply with the *International Mechanical Code* and be provided at a minimum rate of 1 cfm per square foot [0.00508 $m^3/(s \times m^2)$] of the area of the room.

5906.4.2 Storage of 50 to 1,000 cubic feet.

Storage of fine magnesium scrap in quantities greater than 50 cubic feet (1.4 m^3) [six 55-gallon (208 L) steel drums] shall be separated from other occupancies by an open space of not less than 50 feet (15 240 mm) or by ~~a *fire barrier*~~ *barriers*~~constructed in accordance with Section 707 of the International Building Code~~.

6306.4 Maximum aggregate quantity.

The maximum aggregate quantity of liquid oxygen allowed in storage and in use in each *dwelling unit* shall be 31.6 gallons (120 L).

Exceptions:

1. The maximum aggregate quantity of liquid oxygen allowed in Group I-4 occupancies shall be limited by the maximum allowable quantity set forth in Table 5003.1.1(1).

2. Where individual sleeping rooms are separated from the remainder of the *dwelling unit* by not less than 1-hour *fire barriers* ~~constructed in accordance with Section 707 of the International Building Code,~~ and/or *horizontal assemblies* ~~constructed in accordance with Section 711 of the International Building Code~~, or both, ~~having a minimum *fire resistance rating* of 1 hour,~~ the maximum aggregate quantity per *dwelling unit* shall be increased to allow not more than 31.6 gallons (120 L) of liquid oxygen per sleeping room.

6404.1.4 Separation from incompatible materials.
In addition to the requirements of Section 5003.9.8, indoor storage of *pyrophoric* materials shall be isolated from incompatible hazardous materials by 1-hour *fire barriers* ~~with openings protected in accordance with the *International Building Code*~~.

Exception: Storage in *approved* hazardous materials storage cabinets constructed in accordance with Section 5003.8.7.

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Revise as follows:

[F] 403.3 Automatic sprinkler system.
Buildings and *structures* shall be equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1 and a secondary water supply where required by Section 403.3.3.

Exception: An *automatic sprinkler system* shall not be required in spaces or areas of telecommunications equipment *buildings* used exclusively for telecommunications equipment, associated electrical power distribution equipment, batteries and standby engines, provided that those spaces or areas are equipped throughout with an *automatic* fire detection system in accordance with Section 907.2 and are separated from the remainder of the *building* by not less than 1-hour *fire barriers* ~~constructed in accordance with Section 707~~ or not less than 2-hour *horizontal assemblies* ~~constructed in accordance with Section 711,~~ or both.

[F] 403.4.8.1 Equipment room.
If the *standby or emergency power system* includes a generator set inside a *building*, the system shall be located in a separate room enclosed with 2-hour *fire barriers* ~~constructed in accordance with Section 707~~ or *horizontal assemblies* ~~constructed in accordance with Section 711~~, or both. System supervision with manual start and transfer features shall be provided at the *fire command center*.

Exception: In Group I-2, Condition 2, manual start and transfer features for the critical branch of the emergency power are not required to be provided at the *fire command center*.

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

Exceptions:

1. That area of a *building* adjacent to or above the *atrium* need not be sprinklered provided that portion of the *building* is separated from the *atrium* portion by not less than 2-hour *fire barriers* ~~constructed in accordance with Section 707~~ or *horizontal assemblies* ~~constructed in accordance with Section 711,~~ or both.
2. Where the ceiling of the *atrium* is more than 55 feet (16 764 mm) above the floor, sprinkler protection at the ceiling of the *atrium* is not required.

[F] 412.3.6.2 Separation of maximum single fire areas.
Maximum single *fire areas* established in accordance with hangar classification and construction type in Table 412.3.6 shall be separated by not less than 2-hour *fire walls* ~~constructed in accordance with Section 706~~. In determining the maximum single *fire area* as set forth in Table 412.3.6, ancillary uses that are separated from aircraft servicing areas by ~~a *fire barrier* of~~ not less than 1 hour *fire barriers*~~, constructed in accordance with Section 707,~~ shall not be included in the area.

[F] 414.2.1 Construction requirements.
Control areas shall be separated from each other by *fire barriers* ~~constructed in accordance with Section 707~~ or *horizontal assemblies* ~~constructed in accordance with Section 711,~~ or both.

[F] 414.2.3 Number.
The maximum number of *control areas* within a *building* shall be in accordance with Table 414.2.2. For the purposes of determining the number of *control areas* within a *building*, each portion of a *building* separated by one or more *fire walls* ~~complying with Section 706~~ shall be considered a separate *building*.

[F] 415.10.2 Gas rooms.
Where *gas rooms* are provided, such rooms shall be separated from other areas 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.

[F] 415.10.4 Separation of highly toxic solids and liquids.
Highly toxic solids and liquids not stored in *approved hazardous materials storage* cabinets shall be isolated from other *hazardous materials storage* by not less than 1-hour *fire barriers* ~~constructed in accordance with Section 707~~ or *horizontal assemblies* ~~constructed in accordance with Section 711,~~ or both.

[F] 415.11.1.2 Separation.
Fabrication areas, whose sizes are limited by the quantity of *hazardous materials* allowed by Table 415.11.1.1, shall be separated from each other, from *corridors* and from other parts of the *building* by not less than 1-hour *fire barriers* ~~constructed in accordance with Section 707~~ or *horizontal assemblies* ~~constructed in accordance with Section 711,~~ or both.

Exceptions:

1. Doors within such *fire barrier* walls, including doors to *corridors*, shall be only *self-closing fire door assemblies* having a *fire protection rating* of not less than $^3/_4$ hour.
2. Windows between *fabrication areas* and *corridors* are permitted to be fixed glazing *listed* and *labeled* for a *fire protection rating* of not less than $^3/_4$ hour in accordance with Section 716.

[F] 415.11.1.6 Ventilation.
Mechanical exhaust *ventilation* at the rate of not less than 1 cubic foot per minute per square foot [0.0051 $m^3/(s \times m^2)$] of floor area shall be provided throughout the portions of the *fabrication area* where *HPM* are used or stored. The exhaust air duct system of one *fabrication area* shall not connect to another duct system outside that *fabrication area* within the *building*.
A *ventilation* system shall be provided to capture and exhaust gases, fumes and vapors at *workstations*.

Two or more operations at a *workstation* shall not be connected to the same exhaust system where either one or the combination of the substances removed could constitute a fire, *explosion* or hazardous chemical reaction within the exhaust duct system.

Exhaust ducts penetrating *fire barriers* ~~constructed in accordance with Section 707~~ or *horizontal assemblies* ~~constructed in accordance with Section 711~~ shall be contained in a *shaft* of equivalent fire-resistance-rated construction. Exhaust ducts shall not penetrate *fire walls*.

Fire dampers shall not be installed in exhaust ducts.

[F] 415.11.6.1 HPM rooms and gas rooms.
HPM rooms and *gas rooms* shall be separated from other areas by *fire barriers* ~~constructed in accordance with Section 707~~ or *horizontal assemblies* ~~constructed in accordance with Section 711,~~ or both. The *fire-resistance rating* shall be not less than 2 hours where the area is 300 square feet (27.9 m^2) or more and not less than 1 hour where the area is less than 300 square feet (27.9 m^2).

[F] 415.11.6.2 Liquid storage rooms.
Liquid storage rooms shall be constructed in accordance with the following requirements:

1. Rooms greater than 500 square feet (46.5 m^2) in area, shall have not fewer than one exterior door *approved* for fire department access.
2. Rooms shall be separated from other areas by *fire barriers* ~~constructed in accordance with Section 707~~ or *horizontal assemblies* ~~constructed in accordance with Section 711,~~ or both. The *fire-resistance rating* shall be not less than 1 hour for rooms up to 150 square feet (13.9 m^2) in area and not less than 2 hours where the room is more than 150 square feet (13.9 m^2) in area.
3. Shelving, racks and wainscotting in such areas shall be of noncombustible construction or wood of not less than 1-inch (25 mm) nominal thickness or *fire-retardant-treated wood* complying with Section 2303.2.

4. Rooms used for the storage of Class I *flammable liquids* shall not be located in a *basement*.

[F] 416.2 Spray rooms.
Spray rooms shall be enclosed with not less than 1-hour *fire barriers* ~~constructed in accordance with Section 707~~ or *horizontal assemblies* ~~constructed in accordance with Section 711,~~ or both. Floors shall be waterproofed and drained in an *approved* manner.

[F] 418.4 Tank storage.
Storage areas for *flammable and combustible liquid* tanks inside of *structures* shall be located at or above grade and shall be separated from the processing area by not less than 2-hour *fire barriers* ~~constructed in accordance with Section 707~~ or *horizontal assemblies* ~~constructed in accordance with Section 711,~~ or both.

[F] 418.5 Nitrocellulose storage.
Nitrocellulose storage shall be located on a detached pad or in a separate *structure* or a room enclosed with not less than 2-hour *fire barriers* ~~constructed in accordance with Section 707~~ or *horizontal assemblies* ~~constructed in accordance with Section 711,~~ or both.

[F] 418.6 Finished products.
Storage rooms for finished products that are *flammable or combustible liquids* shall be separated from the processing area by not less than 2-hour *fire barriers* ~~constructed in accordance with Section 707~~ or *horizontal assemblies* ~~constructed in accordance with Section 711,~~ or both.

[F] 426.1.2 Grinding rooms.
Every room or space occupied for grinding or other operations that produce *combustible dusts* in such a manner that the room or space is classified as a Group H-2 occupancy shall be enclosed with *fire barriers* ~~constructed in accordance with Section 707~~ or *horizontal assemblies* ~~constructed in accordance with Section 711,~~ or both. The *fire-resistance rating* of the enclosure shall be not less than 2 hours where the area is not more than 3,000 square feet (279 m^2), and not less than 4 hours where the area is greater than 3,000 square feet (279 m^2).

[F] 427.2.1 One-hour exterior room.
A 1-hour exterior room shall be a room or enclosure separated from the remainder of the *building* 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~~, with a *fire-resistance rating* of not less than 1 hour~~. Openings between the room or enclosure and interior spaces shall be provided with *self-closing* smoke- and draft-control assemblies having a *fire protection rating* of not less than 1 hour. Rooms shall have not less than one *exterior wall* that is provided with not less than two vents. Each vent shall have a minimum free air opening of not less than 36 square inches (232 cm^2) for each 1,000 cubic feet (28 m^3) at normal temperature and pressure (*NTP*) of gas stored in the room and shall be not less than 72 square inches (465 cm^2) in aggregate free opening area. One vent shall be within 6 inches (152 mm) of the floor and one shall be within 6 inches (152 mm) of the ceiling. Rooms shall be provided with not fewer than one automatic fire sprinkler to provide container cooling in case of fire.

[F] 427.2.2 One-hour interior room.
Where an *exterior wall* cannot be provided for the room, a 1-hour interior room shall be provided and shall be a room or enclosure separated from the remainder of the *building* by *fire barriers* constructed in accordance with Section 707 or *horizontal assemblies* constructed in accordance with Section 711, or both, with a *fire-resistance rating* of not less than 1 hour. Openings between the room or enclosure and interior spaces shall be provided with *self-closing* smoke- and draft-control assemblies having a *fire protection rating* of not less than 1 hour. An *automatic sprinkler system* shall be installed within the room. The room shall be exhausted through a duct to the exterior. Supply and exhaust ducts shall be enclosed in a 1-hour rated *shaft enclosure* from the room to the exterior. *Approved* mechanical *ventilation* shall comply with the *International Mechanical Code* and be provided with a minimum rate of 1 cubic foot per minute per square foot (0.00508 $m^3/s/m^2$) of the area of the room.

Revise as follows:

[F] 428.3.1 Separation from other nonlaboratory areas.
Laboratory suites shall be separated from other portions of the *building* in accordance with the most restrictive of the following:

1. *Fire barriers* and *horizontal assemblies* as required in Table 428.3. ~~*Fire barriers* shall be constructed in accordance with Section 707 and *horizontal assemblies* constructed in accordance with Section 711.~~

   Exception: Where an individual *laboratory suite* occupies more than one *story*, the *fire-resistance rating* of intermediate floors contained within the *laboratory suite* shall comply with the requirements of this code.

2. Separations as required by Section 508.

[F] 903.2 Where required.

Approved automatic sprinkler systems in new *buildings* and *structures* shall be provided in the locations described in Sections 903.2.1 through 903.2.12.

Exception: Spaces or areas in telecommunications *buildings* used exclusively for telecommunications equipment, associated electrical power distribution equipment, batteries not required to have an *automatic sprinkler system* by Section 1207 of the *International Fire Code* for energy storage systems and standby engines, provided that those spaces or areas are equipped throughout with an *automatic smoke detection system* in accordance with Section 907.2 and are separated from the remainder of the *building* by not less than 1-hour *fire barriers* ~~constructed in accordance with Section 707~~ or not less than 2-hour *horizontal assemblies* ~~constructed in accordance with Section 711,~~ or both.

[F] 909.11.1 Equipment room.

The standby power source and its transfer switches shall be in a room separate from the normal power transformers and switch gears and ventilated directly to and from the exterior. The room shall be enclosed with not less than 1-hour *fire barriers* ~~constructed in accordance with Section 707 or~~ *horizontal assemblies* ~~constructed in accordance with Section 711,~~ or both.

[F] 910.4.5 Manual control location.

Manual controls shall be located where they are able to be accessed by the fire service from an exterior door of the *building* and separated from the remainder of the *building* 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.

[F] 911.1.2 Separation.

The *fire command center* shall be separated from the remainder of the *building* by not less than ~~a~~ 1-hour *fire barrier*<u>*s*</u> ~~constructed in accordance with Section 707~~ or *horizontal* <u>*assemblies*</u> ~~*assembly* constructed in accordance with Section 711,~~ or both.

Reason: This proposal is designed to provide consistency with references to fire-resistance-rated construction requirements. The 2024 IFC makes multiple references to the IBC for construction of fire walls, fire barriers, fire partitions, smoke barriers, smoke partitions and horizontal assemblies. The format of these references is not consistent. In some cases, the IFC simply specifies a “1-hour fire barrier” as in Section 6304.1.6.

6304.1.6 Separation of Class 4 oxidizers from other materials. In addition to the requirements in Section 5003.9.8, Class 4 oxidizer liquids and solids shall be separated from other hazardous materials by not less than a 1-hour fire barrier or stored in hazardous materials storage cabinets.

In other cases, the IFC specifies a “2-hour fire barrier constructed in accordance with Section 707 of the International Building Code.” See Section 909.20.2 in the code change. These various formats also occur with horizontal assemblies, fire walls, etc., and this inconsistency can create confusion. This code change proposes the following revisions to simplify the references:

1. Section 702.1 is added to cover all references to the construction requirements in the IBC.
2. Rather than calling out “Section 7xx of the International Building Code”, each reference only needs to state “fire walls”, or “fire barrier”, or “smoke barrier.”
3. A separate code change is removing the list of defined terms in Section 702. In that code change, Section 702.1 reads exactly the same as shown in this proposal. However, this code change goes one step further to revise all the referenced sections.
4. In Section 702.1 each type of fire-resistant component is listed along with a reference to the appropriate Section in the IBC. In this fashion, the IFC makes only a single reference the requirements in the IBC and it does not need repetition throughout the book. Repeating the reference is not necessary, because when the IFC requires a fire barrier, where else will the code user go to determine the construction requirements.

5. Sections 605.4.2.6 and 2311.8.3 retain the reference to a 1-hour rated opening protectives, because this is different than the requirement for ¾-hour in IBC Table 716.1(2). This is intentionally retained, because it is more restrictive and is specific to the application.
6. In Sections 3704.3, the reference to ¾-hour opening protectives is deleted, because IBC Table 716.1(2) already makes this requirement for a 1-hour fire barrier.
7. In Sections 3704.4 and 3704.5, the reference to 1½-hour opening protectives is deleted, because IBC Table 716.1(2) already makes this requirement for a 2-hour fire barrier.

There are multiple occurrences in the 2024 IFC where fire barriers or horizontal assemblies are specified with any reference to the IBC. Some of those sections are:

1. **1206.6.2** Separation or rooms containing stationary fuel cell power systems
2. **3509.4** Manifolding of oxygen cylinders
3. **3403.2** Location of buffing operations
4. **Table 5003.8.2 Footnote d** Detached buildings
5. **5606.5.2.1 #3.6** Smokeless propellants
6. **Table 5704.3.4.1 Footnote a** MAQs for Flammable and Combustible Liquids in Wholesale and Retail Sales Occupancies
7. **5705.3.6.2.5** Separation of parts cleaning machines

This proposal will provide consistency throughout all the references and will eliminate unnecessary language.

Cost Impact: The change proposal is editorial in nature or a clarification and has no cost impact on the cost of construction

Justification for no cost impact:

This proposal is editorial and simply removes superfluous language from the code. There is no change in code requirements or code application.

FS21-24 Part II

FS22-24

IBC: SECTION 202 (New), 706.1.1

Proponents: Ronald Clements, Chesterfield County, VA, Chesterfield County, VA (clementsro@chesterfield.gov)

2024 International Building Code

Add new definition as follows:

PARTY WALL. Any wall located on a *lot line* between adjacent *buildings*, which is used or adapted for *joint* service between the two *buildings.*

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*,~~ A *party wall* shall be installed on lot lines that divide a building. *Party walls* shall be constructed as a *fire wall* in accordance with Section 706. Party walls shall be constructed without openings and shall create separate *buildings*.

Exceptions:

1. Openings in a party wall separating an *anchor building* and a *mall* shall be in accordance with Section 402.4.2.2.1.
2. Party walls and *fire walls* are not required on *lot lines* dividing a *building* for ownership purposes where the aggregate height and area of the portions of the *building* located on both sides of the *lot line* do not exceed the maximum height and area requirements of this code. For the *building official's* review and approval, the official 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: It is commonly understood that a party wall is required to be installed on a lot line when a lot line divides a building. The issue is that 706.1.1 does not clearly state the party wall is required when a lot line divides a building. Section 706.1.1only states that "any wall located on a lot line" shall be constructed as a fire wall. If the designer chooses not to install a wall on the lot line, 706.1.1 does not mandate installation of the wall, only compliance if the wall is provided. Clearly that is not the intent. There is no provision that states a building cannot cross a lot line. The commentary to this section suggests use of a party wall is an option to back to back exterior walls, which goes back to fire separation distance (FSD) requirements. But, neither the FSD definition nor section 705 mention use of the FSD requirements for interior lot lines. Section 705 is exterior walls and the definition of exterior wall does not include walls on property lines, it is specific to "enclosing" walls of a building. The intent for party walls to be required on lot lines is further supported by 706.1.1 exception 2, which would not be necessary if the intent of 706.1.1 was not to required party walls whenever a lot line divides a building. The designer could just choose not to install the wall and exception 2 would not be necessary. Clearly the intent is that a party wall is to be provided on a lot line dividing a building.This code change clearly states the requirement to install the party wall on the lot line. The clause in 706.1.1, which effectively defines the "party wall" term has been moved to Section 202 as a formal definition. This is a cleaner approach to referring to the wall as both an undefined "party wall" and a defined "fire wall" within section 706.1.1. Text has been added to 706.1.1 to clearly state that a party wall shall be installed on lot lines that divide buildings.

Cost Impact: The change proposal is editorial in nature or a clarification and has no cost impact on the cost of construction

Justification for no cost impact:

This code change is editorial so there is no cost impact to calculate.

FS23-24

IBC: 706.3

Proponents: David Bueche, Hoover Treated Wood Products, Hoover Treated Wood Products (dbueche@frtw.com)

2024 International Building Code

Revise as follows:

706.3 Materials.

Fire walls shall be of any *approved* noncombustible materials.

Exception: *Buildings* of Type III or V construction.

Reason: Type III construction allows use of untreated combustible materials in all locations except in a fire wall or an exterior wall. The code already allows 2 hour exterior wall to be constructed of fire-retardant-treated wood in lieu of noncombustible materials in Type III construction. It makes sense to extend that to a fire wall as the performance would be no different. This code change eliminates any potential conflict with Section 602.3.

Furthermore, building a fire wall using a completely different construction method such as concrete or masonry not employed in the remainder of the building requires a specialty contractor. This may result in scheduling and coordination conflicts and delays that necessarily result in higher costs.

Note that the fire resistances listed in Table 706.4 remain unchanged.

Cost Impact: Decrease

Estimated Immediate Cost Impact:

$0.00

The addition of fire-retardant-treated wood as an option to this section of the code may decrease the cost of construction.

Estimated Immediate Cost Impact Justification (methodology and variables):

Fire-retardant-treated wood is generally less expensive than noncombustible materials. Because FRTW may be used as an alternate to these materials, the cost may be less.

FS24-24

IBC: 706.5

Proponents: Tim Pate, City and County of Broomfield, Colorado Chapter Code Development Committee (tpate@broomfield.org)

2024 International Building Code

Revise as follows:

706.5 Horizontal continuity.
Fire walls shall be continuous from *exterior wall* to *exterior wall* and shall 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 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* shall be protected by opening protectives having a *fire protection rating* of not less than $^{3}/_{4}$ hour.
2. *Fire walls* shall be permitted to terminate at the interior surface of *fire-retardant-treated-wood* or 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 *fire-retardant-treated-wood* or 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.

Reason: This proposal is to add fire retardant treated wood in addition to the noncombustible sheathing in 706.5 exception 2 and 3. This would be equivalent to 706.6 #4 for vertical continuity which requires fire-retardant-treated wood roof sheathing for roof sheathing or installing the ⅝" type X drywall to underside of regular roof sheathing.

Cost Impact: The change proposal is editorial in nature or a clarification and has no cost impact on the cost of construction

Justification for no cost impact:

This proposal will not increase or decrease cost of construction since it is adding another type of product to meet the code

FS25-24

IBC: 706.5.1

Proponents: Tim Pate, City and County of Broomfield, Colorado Chapter Code Development Committee (tpate@broomfield.org)

2024 International Building Code

Revise as follows:

706.5.1 Exterior walls.

Where the *fire wall* intersects *exterior walls* and the *exterior walls* form an angle on the exterior of the building of less than 180 degrees (3.14 rad), 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 705.9. 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 705.9. ~~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: This proposal is to move the language in 706.5.1 #1 and #2 for the location of fire wall to the main scope of section 706.5.1 and to modify the language to only apply to exterior walls that form an angle of less than 180 degrees, rather than indication when the requirements do not apply. The horizontal continuity of the fire wall is dealt with in section 706.5 and fire rating and opening protection is listed in that section based on installing an 18" fire wall projection or one of the three exceptions.

This change is proposed to revise the current language that indicates when "exterior wall protection" is not needed to instead indicate when a "fire-resistance rating and opening protection" is needed in the exterior walls. The current language is problematic in that it talks about "exterior wall protection", but never indicates what this is since this term is not used elsewhere in this section. Because of this, designers have mis-interpreted this as being not only an exception to the exterior wall requirements in 706.5.1, but also an exception to the fire wall continuity requirements in 706.5 that has similar wording in Exception 1. The revised wording makes it clear when the requirements of 706.5.1 apply and cannot be mis-interpreted as an exception to 706.5 Exception 1.

There is also added language to help explain where the angle is measured (on exterior).

Cost Impact: The change proposal is editorial in nature or a clarification and has no cost impact on the cost of construction

Justification for no cost impact:

This proposal will not have any cost impact since it is modifying language to clarify the code requirements

FS26-24

IBC: 707.3, 707.3.12 (New)

Proponents: Micah Chappell, Seattle Department of Construction and Inspections, Seattle Department of Construction and Inspections (micah.chappell@seattle.gov); Ardel Jala, Seattle Dept of Construction & Inspections, Seattle Dept of Construction & Inspections (ardel.jala@seattle.gov)

2024 International Building Code

707.3 Fire-resistance rating.
The *fire-resistance rating* of *fire barriers* shall comply with this section.

Add new text as follows:

707.3.12 Energy Storage Systems. The *fire barrier* separating *energy storage systems* from other spaces in the building shall have a minimum 2-hour *fire-resistance rating.*

Reason: The 2024 International Fire Code (IFC) requires fire barriers provide a 2-hour fire resistance rating when separating areas containing energy storage systems (ESS), from other areas of the building, and has a pointer to Section 707 of the International Building Code (IBC). This proposed additional language to Section 707.3 of the IBC provides the minimum fire resistance rating required for those fire barriers aligning the IBC with IFC.

Cost Impact: The change proposal is editorial in nature or a clarification and has no cost impact on the cost of construction

Justification for no cost impact:

The IFC already required the rated separation and this code change proposal only aligns the IBC with the existing requirement.

FS27-24

IBC: 707.4, 707.4.1 (New), 707.4.2 (New), 708.5.1 (New)

Proponents: Angela Haupt, City of Kirkland, City of Kirkland WA, Plan Review Supervisor (ashaupt@kirklandwa.gov); Jonathan Siu, Jon Siu Consulting, LLC, Self

2024 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 separation or enclosure for a *stairway, ramp* or *exit passageway*, 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.~~ Exterior walls that are a part of a rated enclosure or intersect a fire barrier, shall comply with Section 707.4.1 and 707.4.2.

~~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,* Section 1024.8 for *exit passageways* and Section 1027.6 for *exterior exit stairways and ramps.*~~
2. ~~*Exterior walls* required to be *fire-resistance rated* in accordance with Section 1207 of the *International Fire Code* for enclosure of energy storage systems.~~

Add new text as follows:

707.4.1 Exterior walls of shafts, separations, or stairway, ramp, or exit passageway enclosures. Where *exterior walls* serve as a part of a required fire-resistance-rated *shaft*, or separation or enclosure for a *stairway*, *ramp* or *exit passageway*, 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.

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*, Section 1024.8 for *exit passageways* and Section 1027.6 for *exterior exit stairways* and *ramps.*
2. *Exterior walls* required to be *fire-resistance rated* in accordance with Section 1207 of the *International Fire Code* for enclosure of energy storage systems.

707.4.2 Fire barrier intersections at exterior walls. Where *fire barriers* other than those in Section 707.4.1 intersect 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 barrier* shall have the same *fire-resistance rating* as the *fire barrier* with opening protection in accordance with Section 716. The fire-resistance rating of the exterior wall shall extend not less than 4 feet (1220) on each side of the intersection of the fire partition to exterior wall.

2. Spaces on both sides of the intersecting *fire barrier* shall assume to have an imaginary lot line at the *fire barrier* and extending beyond the exterior of the *fire barrier*. The location of the assumed line in relation to the exterior walls and the *fire barrier* shall be such that the exterior wall and opening protection meet the requirements set forth in Sections 705.5 and 705.9.

Exception: *Exterior walls* forming an angle equal to or greater than 180 degrees (3.14 rad) at intersections with *fire barriers* do not need to be fire-resistance rated and openings do not need a fire protection rating unless otherwise required by this code.

708.5.1 Dwelling and sleeping unit separation walls. Where *exterior walls* intersect *fire partitions* required in Section 420.2 to separate

dwelling or sleeping units from each other and from other occupancies, 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 partition* shall have the same *fire-resistance rating* as the *fire partition* with opening protection in accordance with Section 716. 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 partition* to *exterior wall*.
2. Spaces on both sides of the intersecting *fire partition* shall assume to have an imaginary lot line at the *fire partition* and extending beyond the exterior of the *fire partition*. The location of the assumed line in relation to the *exterior walls* and the *fire partition* shall be such that the *exterior wall* and opening protection meet the requirements set forth in Sections 705.5 and 705.9.

Exception: *Exterior walls* forming an angle equal to or greater than 180 degrees (3.14 rad) at intersections with *fire partitions* do not need to be fire-resistance rated and openings do not need a *fire protection rating* unless otherwise required by this code.

Reason: The purpose of this code change proposal is to provide a measure of protection to prevent fire from spreading around fire barriers and dwelling/sleeping unit fire partitions where they intersect exterior walls.

Fire barriers are required for separated occupancies and fire area separations, among other building elements. The fire barriers are required to be fire-resistance rated, and openings in them are required to be protected. The point of these requirements is to prevent the spread of fire within the building. However, there is no requirement protection provided where the fire barriers intersect exterior walls. Thus, the current code would allow the spread of fire between adjacent compartments, around the end of the fire barrier, via unprotected walls and openings in exterior walls. As shown in Figure 1 below, a door in the fire barrier immediately adjacent to the intersection with the exterior wall would be required to have a fire protection rating, but the openings adjacent to the same intersection could be unrated. This does not make sense, as a fire in Compartment B can easily flank the end of the fire barrier and enter Compartment A.

Similarly, the code requires fire-resistance rated construction and opening protection between dwelling units/sleeping rooms, separating each from themselves, each other and between them and other occupancies. However, the code does not address the separation between them if it is an exterior wall of the same building. If there are dwelling units separated with a fire partition that terminates at an exterior wall that is less than 180 degrees, such as the inside corner of a court or L shaped structure, the exterior walls have no requirement for fire protection and no restrictions on openings. See Figure 2 for a real-life example. If instead there are two residential towers that meet at their corners to form a 90 degree angle, then per IBC 705.3 an imaginary lot line is required between the buildings. In this case fire separation distance and opening protection is required for both structures. Whether the exterior walls are two separate dwelling units in the same building or in an adjacent building, fire travels the same. With unrated walls and openings in close proximity to each other, the fire can travel from one unit to the next more easily, similar to the scenario in Figure 1.

This code change proposal addresses these issues by requiring either 4-foot “wings” on either side of the fire barriers (Section 707.4.2, Item 1) or fire partitions (Section 708.5.1, Item 1) or providing exterior wall ratings and opening protection required by the location of an imaginary property line (Item 2 of each section). Figure 3 shows an example of how this can be done for the fire barrier scenario shown in Figure 1 but could be applied to fire partitions as well. The proposed language is based on the parallel requirements for fire walls and only applies where the exterior walls form an angle of less than 180 degrees. It also does not apply to exterior walls for fire-resistance-rated *shafts,* or separation or enclosure for a *stairway, ramp* or *exit passageway*.

The struck-through text in Section 707.4 has been relocated to Section 707.4.1 without change.

There is an ever-increasing demand for greater density housing. Architects are becoming more creative in their designs and how to maximize the number of units in a given space. This means more units with more uniquely shaped buildings that provide the highest amount of exterior wall area that meet light and ventilation requirements. Requiring the exterior walls and openings of separate dwelling units to meet the fire ratings required as if they are separate buildings is a needed improvement for life safety.

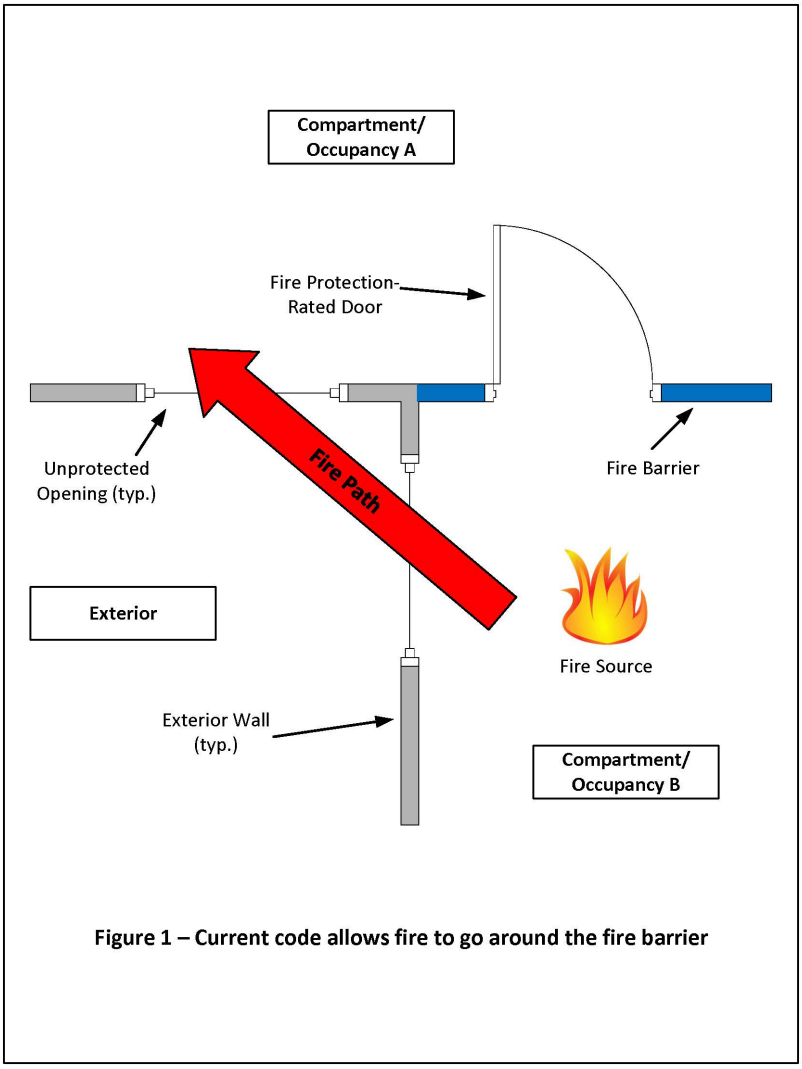


Figure 1 – Current code allows fire to go around the fire barrier

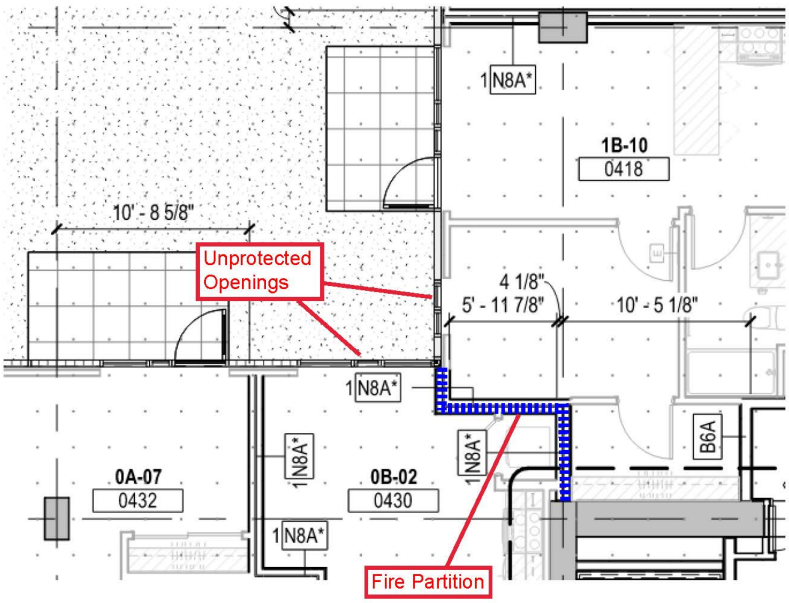


Figure 2 - Unit Separation Wall (Fire Partition)

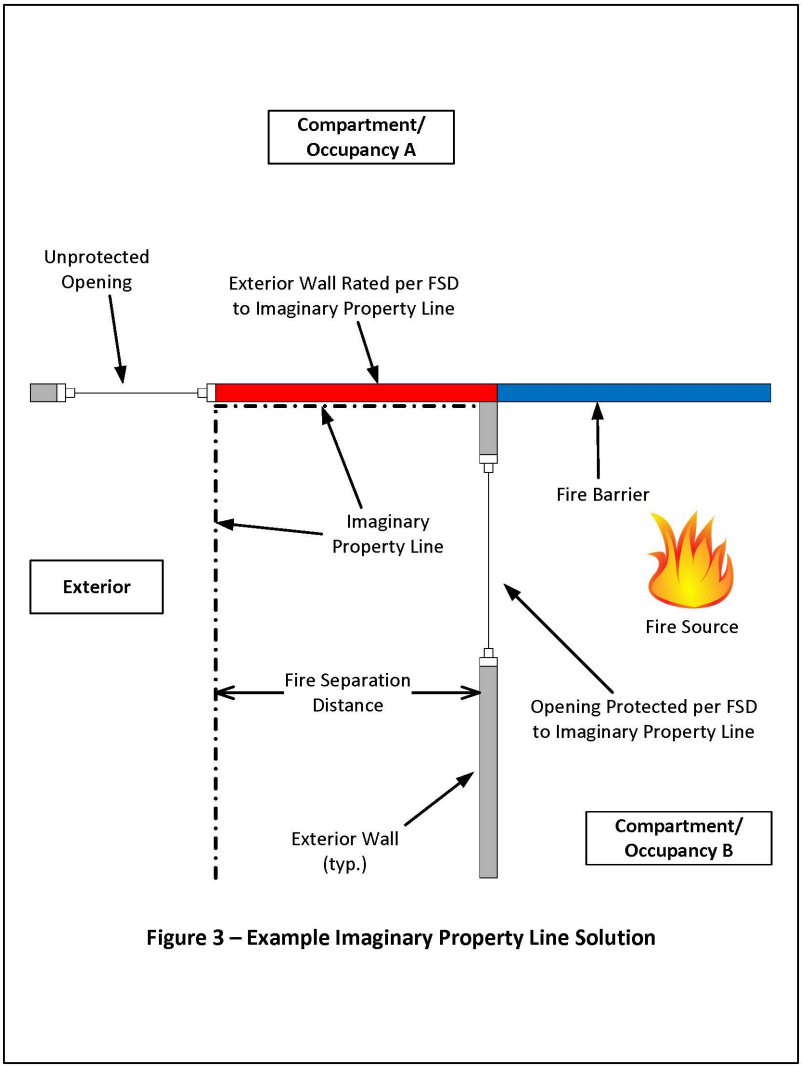


Figure 3 – Example Imaginary Property Line Solution

Cost Impact: Increase

Estimated Immediate Cost Impact:

This change may increase the cost of portions of exterior walls by requiring the use of fire-rated construction and protected openings where it wasn't previously required.

Estimated Immediate Cost Impact Justification (methodology and variables):

Currently, exterior walls adjoining fire barriers and fire partitions do not require fire-rating or protected openings except for specific conditions such as construction type and fire separation distance. This new provision would require exterior walls that are less than 180 degrees at the fire barrier or fire partition intersection to possibly be fire rated with protected openings for a minimal distance of 4 feet. These new provisions would not apply to all exterior walls that intersect fire barriers and fire partitions. The fire rating and opening protection requirements would normally apply at narrow interior courts, inside corners of courts, recessed wall areas and inside corners of non-rectangular structures. The impact can also be mitigated by using design techniques such as shifting openings and proper placement of the fire barriers and fire partitions away from inside corners or recesses. For mid-rise type V-B wood frame multi-family buildings that don't typically require rated exterior walls, the added cost will be equivalent to two layers of Type X GWB, one on the interior and one on the exterior.

Non-rated wood wall cost: $10 + $17 = $27/4ft width
Fire-rated wood shear wall cost: $20 + $20 = $40/4ft section width
Difference in cost= $13/4ft width

For steel construction that doesn't typically require rated exterior walls, the added cost would be a layer of DensGlass on the exterior and type X GWB on the inside.

Non-rated steel construction: $10/4ft width
Fire-rated steel construction: $28 + $20 = $48/4ft section width
Difference in cost= $38/4ft width

Protected openings (doors & windows) can add $200-$900 depending on the size and rating.
Approximate prices of materials:

For Rated Walls

(Wood Construction) 5/8 x 4 x 8 sheet Type X Gypsum Exterior & Interior - $20

(Steel Construction) 5/8 x 4 x 8 DensGlass Gold Fireguard- $28

Non-rated Walls

(Wood Construction for Shear walls) OSB/CDX Exterior - $17
(Steel and wood interior) Drywall - $10

Fire-rated Doors
Avg $650
Fire-rated Glazing
Avg $200-$400

Estimated Life Cycle Cost Impact:

N/A

Estimated Life Cycle Cost Impact Justification (methodology and variables):

N/A

FS27-24

FS28-24

IBC: 707.5.1

Proponents: Paul Battaglia, STC Sound Control, STC Sound Control (paul@stcsoundcontrol.com)

2024 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 509.1 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 1- and 2-hour fire barriers in buildings of Type IIB, IIIB and VB construction is not required to be fire resistance rated in buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2.

Reason: Section 707.5.1 of the IBC requires protection of supporting construction for a fire barrier, which is a reasonable requirement. Exception 2 to the paragraph allows an exception for 1-hour fire barriers in buildings of Type IIB, IIIB and VB construction. This exception is also reasonable since the structure of these buildings have no protection per Table 601 and protection of the supporting construction alone has no perceivable benefit.

We propose that the exceptions be expanded to **include 2-hour fire barriers,** based upon the provision that the building is protected throughout with **an automatic sprinkler system.** Sprinklers provide an additional level of safety for the building and protection of the supporting construction alone has no perceivable benefit.

Proposed text: **ADD the following Exception to 707.5.1:**

"3. Supporting construction for 1- and 2-hour fire barriers in buildings of Type IIB, IIIB and VB construction is not required to be fire-resistance rated in buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2."

Cost Impact: Decrease

Estimated Immediate Cost Impact:

The total cost of materials and labor for fire protection is decreased, dependent on scope of the project.

Estimated Immediate Cost Impact Justification (methodology and variables):

Example: A recent project had 2 fire stairs and 2 elevators, each 4 stories (basement through 3rd floor). Fire protection of steel supporting the 2-hour fire partitions at the vertical openings cost $129,700. The building has 89,568 gsf, so the additional cost is $1.45 psf for the project budget. This should be comparable to other buildings.

Estimated Life Cycle Cost Impact:

The savings are included in a lower initial construction cost, assuming the building is sprinklered for other reasons. Life cycle cost impacts are lower due to lower debt service costs.

Estimated Life Cycle Cost Impact Justification (methodology and variables):

The savings are included in a lower initial construction cost, assuming the building is sprinklered for other reasons. Life cycle cost impacts are lower due to lower debt service costs. Example: With a 6%, 30-year mortgage the annual savings for the $1.45 psf cost is $0.105 psf, so a 100,000 sf building would save $10,534 annually. For the term of the mortgage the cost savings would be $316,017.

FS29-24

IBC: SECTION 202, 707.9, 715.6

Proponents: Robert Marshall, FCAC, FCAC (fcac@iccsafe.org)

2024 International Building Code

Revise as follows:

[BF] CONTINUITY HEAD-OF-WALL 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 floor or roof assemblies that are not fire-resistance rated for a prescribed period of time.

707.9 Voids at intersections.
The voids created at the intersection of a *fire barrier* and a nonfire-resistance-rated floor assembly, nonfire-resistance-rated *roof assembly* or a nonfire-resistance-rated *exterior wall* assembly shall comply with Section 715.

715.6 Fire barrier/nonfire-resistance-rated floor or roof assembly intersections.
Voids created at the intersection of a fire barrier and the underside of a nonfire-resistance-rated floor or roof sheathing, slab or deck above shall be filled by an *approved* material or system to retard the passage of fire and hot gases, or shall be protected by an *approved continuity head-of-wall system* 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 *fire barrier* in which it is installed.

Reason: By adding the word “floor” this proposal provides additional language which is consistent with the language already found in Section 707.5 covering the fire barrier continuity provisions. Although the continuity provisions imply the protection of the void above a fire barrier, the new language provides much needed specific guidance which will ensure proper continuity when this construction scenario is encountered within the built environment.Adding the word “floor” ensures that the space above the top of a fire barrier wall, and below the non-rated horizontal construction above is properly filled by an approved material or system.

FCAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2023 and early 2024 the FCAC has held several virtual meetings and one in-person meeting open to any interested party. In addition, there were numerous virtual Working Group meetings for the current code development cycle, which included members of the committee as well as interested parties. Related documents and reports are posted on the **FCAC Website**

Cost Impact: The change proposal is editorial in nature or a clarification and has no cost impact on the cost of construction

Justification for no cost impact:

This proposal does not increase cost of construction. The continuity provisions contained in Section 707.5 requires any void at the top of wall to be protected whether it is a roof assembly or the underside of a floor assembly. Although adding the word floor is new language, it simply confirms a requirement already contained in Section 707.5 covering the fire barrier continuity provisions. This new language provides additional details on how to maintain the continuity. The need to protect this void between the top of the wall and the floor or roof, slab, or deck is already required.

FS30-24

IBC: 708.1, 708.4.2

Proponents: David Renn, PE, SE, City and County of Denver, Colorado Chapter Code Development Committee (david.renn@denvergov.org)

2024 International Building Code

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 1020.3.
4. Enclosed elevator lobby separation as required by Section 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 *dwelling and sleeping units* in Groups R-1 and R-2 in accordance with Sections 907.2.8.1 and 907.2.9.1.
8. Vestibules in accordance with Section 1028.2.

Revise as follows:

708.4.2 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* serving as *corridor* walls, *fire partitions* separating *ambulatory care facilities* from adjacent spaces or *corridors, fire partitions* separating *dwelling and sleeping units* ~~from~~ in ~~Group~~ Groups R-1 and R-2 in accordance with Sections 907.2.8.1 and 907.2.9.1, ~~occupancies~~ and *fire partitions* separating vestibules from the *level of exit discharge* .

Reason: This proposal corrects what is believed to be a typo in the current language which includes "fire partitions separating dwelling and sleeping units from Group R-1 and R-2 occupancies", which makes no sense since dwelling and sleeping units are Group R-1 and R-2 occupancies. This portion of the exception was added in the 2021 code through proposal FS33-18 with included "in Group R-1 and R-2" instead of "from Group R-1 and R-2" and this proposal makes a change to reflect this. Also, this portion of the exception was intended to match the new Item 7 that was added to 708.1 through FS33-18. To clarify this further, wording is revised to match Item 7 with reference to 907.2.8.1 and 907.2.9.1, which require fire partitions as part of exceptions for manual fire alarm systems - this is needed to distinguish this from fire partitions separating dwelling units and sleeping units that are included earlier in this exception.

Note that Section 708.1 is included in this proposal as reference only - there are no changes proposed to this section.

Cost Impact: The change proposal is editorial in nature or a clarification and has no cost impact on the cost of construction

Justification for no cost impact:

This proposal is editorial in nature to change the wording in the exception to match the wording in Section 708.1, so there will be no cost impact.

FS31-24

IBC: 709.10 (New)

Proponents: Jeff O'Neil, Chair, Committee on Healthcare (ahc@iccsafe.org); William Koffel, Koffel Associates, Inc., California Solar and Storage Association (CALSSA) (wkoffel@koffel.com)

2024 International Building Code

Add new text as follows:

709.10 Separating smoke compartments. Where the horizontal assembly is required to be a smoke barrier, the assembly shall comply with Section 909.

Reason: The code does not completely address where the floors (horizontal assemblies) are required to also be designed as smoke barriers. Section 711.2.4.4 sends you to Section 709 for smoke barriers that are horizontal assemblies. Smoke compartments are required in ambulatory care, Group I-1 Condition 2, Group I-2 and Group I-3. Pressurized stairways also use horizontal smoke barriers.

As indicated in Section 422.3, smoke barriers shall be provided on any story containing an ambulatory care facility which is greater than 10,000 sq. ft. in area. The creation of smoke compartments is required to allow a protect-in-place environment. These compartments allow staff a safer environment to stabilize the care recipients before evacuation and protection for fire personnel who may have to evacuate both care recipients and staff. The requirement for a smoke barrier is based solely on a story-by-story basis without consideration of fire-resistance ratings for the floor assemblies. As such, a smoke barrier is not required for the floor assemblies.

Since the primary performance of smoke barriers is to achieve protection on the fire floor, the supporting construction is not required to provide the same degree of fire resistance for buildings of Types IIB, IIIB and VB construction as specified in Section 709.4. These three construction types are identified since the floor construction is not otherwise required to have a fire-resistance rating and it is not considered essential to require fire-resistance-rated floor construction due to the floor supporting a smoke barrier. As such, since the building in question is of Type IIB construction, the supporting construction for the smoke barrier is not required to have a fire-resistance rating.

This proposal is submitted by the ICC Committee for Healthcare (CHC).
The Committee on Healthcare (CHC) was established by the ICC Board of Directors in 2011 to pursue opportunities to study and develop effective and efficient provisions for Hospital, Nursing Homes, Assisted Living and Ambulatory Care Facilities. This committee was formed in cooperation with the American Society for Healthcare Engineering (ASHE). In July of 2017, the ICC Board made CHC a standing committee. In 2023 the CHC has held several virtual meetings open to any interested party. In addition, there were numerous virtual Working Group meetings for the current code development cycle, which included members of the committee as well as interested parties. Related documents and reports are posted on the CHC website at CHC webpage.

Cost Impact: The change proposal is editorial in nature or a clarification and has no cost impact on the cost of construction

Justification for no cost impact:

This is a clarification with no change to construction requirements. Please refer to the reason statement.

FS32-24

IBC: 711.2.3

Proponents: Jeffrey Evans, Codified Life Safety, Codified Life Safety (jevans@codifiedlifesafety.com)

2024 International Building Code

Revise as follows:

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 509.1 provided that the required *fire-resistance rating* does not exceed 1 hour.
2. *Horizontal assemblies* at the separations of *dwelling units* and *sleeping units* as required by Section 420.3, and Section 420.2 where unit separation wall continuity is in accordance with Section 708.4, Item 2.
3. *Horizontal assemblies* at *smoke barriers* constructed in accordance with Section 709.

Reason: The existing provisions exempting rated supporting construction for horizontal assemblies separating dwelling units only references horizontal assemblies provided per 420.3. Whereas a horizontal assembly may be provided in a building of Type IIB, IIIB, or VB for the purpose of fire partition vertical continuity in accordance with 708.4, Item 2, the lack of reference to this section in the horizontal assembly rated supporting construction exceptions suggests that rated supporting construction is required for a horizontal assembly when it is only provided for dwelling/sleeping unit separation as part of the permitted fire partition continuity. Without reference to 708.4, Item 2, in the horizontal assembly rated supporting construction exceptions, horizontal assemblies in buildings of Type IIB, IIIB, and VB that are only provided for fire partition dwelling/sleeping unit separation continuity are the only assemblies required to have rated supporting construction, which is inconsistent with the principal that dwelling/sleeping unit separations in buildings of non-rated construction types do not require rated supporting construction as established in Sections 708.4.1 and 711.2.3.

Cost Impact: Decrease

Estimated Immediate Cost Impact:

$0.

This clarification has the potential to save the initial construction cost of providing rated supporting construction for horizontal assemblies serving as fire partition vertical continuity.

Estimated Immediate Cost Impact Justification (methodology and variables):

The decrease in construction cost will only apply in the limited case of jurisdictions where rated supporting construction is being required for horizontal assemblies providing continuity for unit separation walls in buildings of non-rated construction types.

Estimated Life Cycle Cost Impact:

There will be no change to life cycle cost resulting from this clarification.

Estimated Life Cycle Cost Impact Justification (methodology and variables):

Structural fire-resistance is understood to have limited life cycle costs.

FS33-24

IBC: 711.2.3

Proponents: David Renn, PE, SE, City and County of Denver, Colorado Chapter Code Development Committee (david.renn@denvergov.org)

2024 International Building Code

Revise as follows:

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 509.1 provided that the required *fire-resistance rating* does not exceed 1 hour.
2. *Horizontal assemblies* at the separations of *dwelling units* and *sleeping units* as required by Section 420.3.
3. *Horizontal assemblies* at *smoke barriers* constructed in accordance with Section 709.
4. *Horizontal assemblies* that have a *fire-resistance-rating* for the sole purpose of complying with Section 708.4 for *fire partition* continuity and the *fire partition* is exempt from supporting construction requirement of Section 708.4.2.

Reason: In non-rated construction types IIB, IIIB and VB, it is common to provide a fire-resistance-rating (FRR) at roofs to allow fire partitions to stop at the ceiling of the roof/ceiling assembly, as allowed by Section 708.4 Item 2. Where these fire partitions are exempt from supporting construction requirements, such as for dwelling or sleeping unit separations, there is no need for the horizontal assembly above these fire partitions to have supporting construction with the same FRR as the roof. Also, Section 711.2.3 Exception Item 2 allows horizontal assemblies that separate dwelling units and sleeping units to not have a supporting construction fire-resistance-rating - this item is intended for floors but is also used to justify not having a supporting construction fire-resistance-rating at the roof since the roof completes the separation between side by side units when the fire partition stops at the ceiling, but this is not completely clear in the current wording.

This proposal adds a 4th item to the exception for horizontal assembly supporting construction FRR to make it clear that this is not required when the FRR is only provided for fire partition continuity requirements and the fire partition itself is exempt from supporting construction requirements. It is believed that this proposal is in line with current design and construction practices since it meets the intent of the exception for fire partition supporting construction requirements.

Cost Impact: The change proposal is editorial in nature or a clarification and has no cost impact on the cost of construction

Justification for no cost impact:

This proposal is a clarification as it is in line with current design and construction practices since it meets the intent of the exception for fire partition supporting construction requirements, so it will have no cost impact.

FS33-24

FS34-24

IBC: 711.2.4, 711.2.4.7 (New)

Proponents: Micah Chappell, Seattle Department of Construction and Inspections, Seattle Department of Construction and Inspections (micah.chappell@seattle.gov); Ardel Jala, Seattle Dept of Construction & Inspections, Seattle Dept of Construction & Inspections (ardel.jala@seattle.gov)

2024 International Building Code

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.

Add new text as follows:

711.2.4.7 Energy Storage Systems. Where the *horizontal assembly* separates *energy storage systems* from the remainder of the building, the assembly shall have a minimum 2-hour *fire-resistance rating*.

Reason: The 2024 International Fire Code (IFC) requires horizontal assemblies provide a 2-hour fire resistance rating when separating areas containing energy storage systems (ESS), from other areas of the building, and has a pointer to Section 711 of the International Building Code (IBC). This proposed additional language to Section 711.2 of the IBC provides the minimum fire resistance rating required for those horizontal assemblies aligning the IBC with IFC.

Cost Impact: The change proposal is editorial in nature or a clarification and has no cost impact on the cost of construction

Justification for no cost impact:

The IFC already required the rated separation and this code change proposal only aligns the IBC with the existing requirement.

FS35-24

IBC: 711.2.4, 711.2.4.7 (New), 711.3, 711.3.3 (New)

Proponents: William Koffel, Koffel Associates, Inc., Firestop Contractors International Association (FCIA) (wkoffel@koffel.com)

2024 International Building Code

Revise as follows:

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~~ 711.2.4.7 but shall be not less than that required by the *building* type of construction.

Add new text as follows:

711.2.4.7 Occupiable roofs. Occupiable roofs shall have penetrations protected in accordance with Section 714 and joints and voids protected in accordance with Section 715. Skylights shall not be located within the occupied area of occupiable roofs.

711.3 Nonfire-resistance-rated floor and roof assemblies.
Nonfire-resistance-rated floor, floor/ceiling, roof and roof/ceiling assemblies shall comply with Sections 711.3.1 and 711.3.2.

Add new text as follows:

711.3.3 Occupiable roofs. Occupiable roofs shall have penetrations, joints and voids protected with materials or systems that prevent the spread of fire through the roof assembly. Skylights shall not be located within the occupied area of occupiable roofs.

Reason: When a roof becomes occupied or occupiable, the safety of the occupants on the roof becomes the same as if they were standing on the floor below. Without a fire-resistance rating and protected penetrations, joints and voids along with restrictions for skylights in the occupied roof area, the occupants are exposed to a fire and life safety risk. When a roof becomes occupied or occupiable, the safety of the occupants on the roof becomes the same as if they were standing on the floor below. Without a fire-resistance rating and protected penetrations, joints and voids, along with regulations for skylights in the occupied roof area, the occupants are exposed to a fire and life safety risk.

The proposal builds on the concept of occupiable roofs, added to the 2024 IBC.

Cost Impact: Increase

Estimated Immediate Cost Impact:

The estimated cost is $35 - $50 per installed firestop system and $35 - $50 per lineal ft. of installed joint sytems.

Estimated Immediate Cost Impact Justification (methodology and variables):

The estimate includes materials and labor costs for any type of penetration system and fire-resistant joint system through a roof assembly. The total cost for any specific building will depend upon the number of penetrations and joint systems.

FS36-24

IBC: 712.1.9

Proponents: Ronald Geren, RLGA Technical Services, LLC, Self (ron@specsandcodes.com)

2024 International Building Code

Revise as follows:

712.1.9 Two-story openings.
In other than Groups I-2 and I-3, a vertical opening that is not used as one of the applications specified in this section shall be permitted if the opening complies with all of the following items:

1. Does not connect more than two *stories.*
2. Does not penetrate a *horizontal assembly* that separates *fire areas* or *smoke barriers* that separate *smoke compartments*.
3. Is not concealed within the construction of a wall or a floor/ceiling assembly.
4. Is ~~not open to~~separated from a *corridor* in Group I and R occupancies by a fire-resistance-rated assembly tested under ASTM E119 or UL 263, or by *smoke partitions* complying with Section 710. In addition, doors protecting openings in the *smoke partitions* shall comply with Sections 710.5.2.2 and 710.5.2.3. Doors in other fire-resistance-rated assemblies shall comply with Section 716.2.2.
5. Is ~~not open to~~separated from a *corridor* on nonsprinklered floors by a fire-resistance-rated assembly tested under ASTM E119 or UL 263, or by *smoke partitions* complying with Section 710. In addition, doors protecting openings in the *smoke partitions* shall comply with Sections 710.5.2.2 and 710.5.2.3. Doors in other fire-resistance-rated assemblies shall comply with Section 716.2.2.
6. Is separated from floor openings and air transfer openings serving other floors by construction conforming to required *shaft enclosures.*

Reason: The words "not open to" in items #4 and #5 are not defined or described. "Not open to" could be interpreted to mean not atmospherically connected and separated by some physical barrier without openings. Or "not open to" could mean that openings are allowed, but there are means of controlling the passage of smoke between the two-story opening and the adjacent corridors.

This proposal eliminates the ambiguity by replacing the words "not open to" with specific provisions that define when a two-story opening is "not open to" a corridor.

Since the intent is to eliminate the passage of smoke from a two-story opening into a corridor under the stated circumstances, providing a means of controlling the smoke is the only option, and the provisions for fire-resistance-rated assemblies and smoke partitions offer that capability.

Cost Impact: Increase

Estimated Immediate Cost Impact:

For jurisdictions requiring some form of physical separation with no openings (i.e., doors and windows) between the two-story opening and a corridor, this change would allow the designer more flexibility, which may or may not reduce cost. If jurisdictions interpret this section to mean that corridors can open into two-story spaces as long as a door with a closer is provided, then this change would add some cost due to the minimal protection required by a smoke partition between the corridor and the two-story space that requires smoke and draft control for any doors. If the separation is already provided by a fire-resistance-rated assembly through some other code requirement, there would be no additional cost since openings would be required to be protected.

Estimated Immediate Cost Impact Justification (methodology and variables):

If minimal protection is required, the cost would be $65 to $100 per opening for "S" labels on the doors and frames and smoke seals around the door perimeter. The majority of the cost will be for the "S" labels (about $40 for the door and frame) and $25 for the seals for a standard 3' by 7' door. Double doors will be at the higher end for the additional label and extra length of perimeter to seal.

FS37-24

IBC: 712.1.15, 711.4 (New), 711.5 (New)

Proponents: Jeffrey Grove, Coffman Engineers, Coffman Engineers (jeff.grove@coffman.com)

2024 International Building Code

Delete without substitution:

~~**712.1.15 Skylights.**~~
~~*Skylights* and other penetrations through a fire-resistance-rated *roof deck* or slab are permitted to be unprotected, provided that the structural integrity of the fire-resistance-rated *roof assembly* is maintained. Unprotected *skylights* shall not be permitted in *roof assemblies* required to be fire-resistance rated in accordance with Section 705.9.6. The supporting construction shall be protected to afford the required *fire-resistance rating* of the *horizontal assembly* supported.~~

Add new text as follows:

711.4 Roof Openings. Roof openings in a fire-resistance-rated roof deck or slab are permitted to be unprotected, provided that the structural integrity of the fire-resistance-rated roof assembly is maintained. Unprotected roof openings shall not be permitted in roof assemblies required to be fire-resistance rated in accordance with Section 705.9.5 and shall comply with the opening protectives of Section 716. The supporting construction shall be protected to afford the required fire-resistance rating of the horizontal assembly supported.

711.5 Roof Penetrations.. Penetrations through a fire-resistance-rated roof deck or slab are permitted to be unprotected, provided that the structural integrity of the fire-resistance-rated roof assembly is maintained. Unprotected through penetrations shall not be permitted in roof assemblies required to be fire-resistance rated in accordance with Section 705.9.5 and shall comply with Section 714 for through penetrations of fire-resistance-rated horizontal assemblies.

Reason: The code does not address unprotected openings within a fire-resistance-rated roof assembly. Historically the skylight section has been used to permit unprotected openings within a fire-resistance rated roof deck or slab as the IBC Code Commentary states that "fire-resistance-rated roof construction is not intended to create a barrier in order to contain the fire within the building, except for Exception 1 of Section 705.8.6 and the exception to Section 706.6.1."

This code change will still apply to skylights but will now address broader roof penetrations and openings. Relocating IBC 712.1.15 to Section 711 aligns with the code's organization, such as how fire and smoke barriers address openings and penetrations within their respective sections. Furthermore, IBC 712.1.15 differs from the type of vertical openings addressed in Section 712 such as shafts, atriums, or two-story vertical openings.

Separating and renaming the skylight section into a roof penetration and roof opening section will clearly indicate the intent/application of the code. Furthermore, this will not limit the application to skylights and make it more general.

Cost Impact: The change proposal is editorial in nature or a clarification and has no cost impact on the cost of construction

Justification for no cost impact:

This code change is intended to be editorial in nature, but it does have the potential to decrease the cost of a project. As the code is currently written it is not very clear that penetrations and openings within a fire-resistance rated roof are permitted to be unprotected where the structural integrity of the roof is maintained. Due to the location and language in IBC Section 712.1.15, not all AHJs have permitted penetrations and openings through a fire-resistance rated roof assembly to be unprotected. This change would clarify the application of IBC Section 712.1.15 reducing the number of fire-stopping details required for a project and decreasing the cost of construction as there would be less fire-stopping/opening protection required where AHJs have previously required penetrations and openings to be protected. Where AHJs use IBC Section 712.1.15 to permit unprotected openings and penetrations within a fire-resistance rated roof, this code change would not impact the cost of construction.

FS38-24

IBC: 713.4, 403.2.1.2, 403.2.1

Proponents: Nicholas Pirkl, Self (info@design2functionllc.com)

2024 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 703.2.1.1.

Exception: ~~Shafts having a reduced fire-resistance rating in *high-rise buildings* in accordance with Section 403.2.1.2.~~For *buildings* not greater than 420 feet (128 m) in *building height*, the required *fire-resistance rating* of the *fire barriers* enclosing vertical *shafts*, other than *interior exit stairway* and elevator hoistway enclosures, is permitted to be reduced to 1 hour where *automatic* sprinklers are installed within the *shafts* at the top and at alternate floor levels.

~~**403.2.1.2 Shaft enclosures.**~~
~~For *buildings* not greater than 420 feet (128 m) in *building height*, the required *fire-resistance rating* of the *fire barriers* enclosing vertical *shafts*, other than *interior exit stairway* and elevator hoistway enclosures, is permitted to be reduced to 1 hour where *automatic* sprinklers are installed within the *shafts* at the top and at alternate floor levels.~~

403.2.1 Reduction in fire-resistance rating.
The *fire-resistance rating* reductions specified in Sections 403.2.1.1 and ~~403.2.1.2~~ 713.4 shall be allowed in *buildings* that have sprinkler control valves equipped with supervisory *initiating devices* and water-flow *initiating devices* for each floor.

Reason: The reduction in the 2-hour fire-resistance rating for shafts connecting 4 or more stories that is allowed in high-rise construction per Section 403.2.1.2, should also be allowed for other fully sprinklered buildings that do not meet the requirements to be classified as a high rise. The code requirements that are specific to high-rise structures (i.e. stairwell pressurization, fire command center, etc.) do not modify the code requirement for the construction of vertical shafts except to add an exception to the fire-resistance rating requirement in Section 713. If it is deemed appropriate to reduce the shaft rating by adding sprinklers inside the shaft for high rise structures up to 420 feet in height, then the use of this provision for structures less than 75' in height would seem equally appropriate.

Cost Impact: Decrease

- **ICC-Shaft-Design-and-Costs.pdf**
  https://www.cdpaccess.com/proposal/9927/29118/documentation/137848/attachments/download/4602/

Estimated Immediate Cost Impact:

This proposed change would reduce the shaft wall construction to 1-hour while only adding a few sprinkler heads inside the shaft. The proposed change would be for fully sprinkled buildings only, so the cost of the additional few sprinkler heads would be less than the material and labor costs for the 2-hour rated shaft walls. Also, since the 2-hour shafts must be supported by 2-hour construction, this change would simplify the detailing at the intersection of shafts and floor/ceiling horizontal assemblies.

Estimated Immediate Cost Impact Justification (methodology and variables):

Mechanical and similar shafts rated for 2-hour fire resistance require either (2) layers of 5/8" gypsum on each face of a studwall, or (1) layer of 1" shaft liner on one face and (2) layers of 5/8" gypsum on the opposite face. 1-hour shafts only require (1) layer of 5/8" gypsum on each face resulting in less material (gypsum board and screws) as well as less labor. Additionally, this proposed change allows for the 1-hour shafts to be supported by 1-hour floor construction.

The addition of (4) sprinkler heads in a 7-story shaft is less expensive than the 1 layer of gypsum board on the exterior face (shaft liner

assembly) assuming a 70' tall 2'-0" by 2'-0" interior dimension shaft.

I have attached estimates for the above work from a drywall contractor and sprinkler contractor we are using on a current project in Colorado Springs, CO. The cost comparison is only for the single layer of gypsum board and the 4 sprinkler heads. There are dozens of UL assemblies for 2-hour and 1-hour shafts that would probably result in a higher cost delta, but the proposed comparison should represent the lowest cost delta.

FS38-24

FS39-24

IBC: 713.13.1

Proponents: Tim Pate, City and County of Broomfield, Self (tpate@broomfield.org)

2024 International Building Code

Revise as follows:

713.13.1 Waste, recycling and linen chute enclosures.
A*shaft enclosure* containing a recycling, 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: This proposal is to delete the requirement to provide protection between the chute discharge room and the shaft above. Sections 713.11 exception 2 and 713.13.4 both require the chute discharge room to be separated from remainder of the building by fire barriers that match the fire rating of the shaft. The words in the general scope of section 713.13.1 therefore do not make sense since this would require installing a horizontal fire damper at the bottom of the shaft. The intent of required protection of chute discharge room along with the chute shaft is separating potential fire for the remainder of the building. It is not clear why you would need protection between discharge room and the chute above and installing a fire damper could become a potential fire issue if the damper closes by mistake and items pile up on top of the closed damper.

Cost Impact: Decrease

Estimated Immediate Cost Impact:

It is estimated that this would result in approximately $1,000 per horizontal fire damper.

Estimated Immediate Cost Impact Justification (methodology and variables):

Provided estimated cost of individual horizontal fire damper - it will be depending on size and number in the overall building

Estimated Life Cycle Cost Impact:

Same as above since it is a one time cost savings per damper

FS40-24

IBC: 714.2, 714.2.1 (New), ASTM Chapter 35 (New)

Proponents: Bill McHugh, CM Services, Firestop Contractors International Association (bill@mc-hugh.us)

2024 International Building Code

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

Add new text as follows:

714.2.1 Firestop Identification Device. Penetration firestop systems shall be permanently identified with a device, label or similar treatment installed in accordance with ASTM WK 70416.

Add new standard(s) as follows:

ASTM

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

WK70416	New Practice for On-Site Identification of Penetration Firestop Systems and Fire-Resistive Joint Systems and Perimeter Fire Barrier

Staff Analysis: A review of the new standard proposed for inclusion in the code, ASTM WK70416 New Practice for On-Site Identification of Penetration Firestop Systems and Fire-Resistive Joint Systems and Perimeter Fire Barrier, with regard to some of the key ICC criteria for referenced standards (Section 4.6 of CP#28) will be posted on the ICC website on or before March 18, 2024.

Reason: At ASTM, a new standard is at the ASTM E06 Main Committee approval process to govern the content and installation of firestop identification devices, WK70416, New Practice for On-Site Identification of Penetration Firestop Systems and Fire-Resistive Joint Systems and Perimeter Fire Barriers. The standard is anticipated to be published during this code development cycle.

The reason to require a firestop identification system is that installing penetration firestop systems looks as easy as applying red caulk into the annular space of a penetration or gap, breach created for a joint or void. Firestop systems are very complex, detailed listed systems that take understanding of the listing tolerances and manufacturers instructions so they work when called upon by fire. The listing number is the driver for correct application. The listing number identifies the penetrating item(s), annular space, breach gap or void size limitations, firestop material manufacturer, materials and thicknesses, compression used, and of course the fire-resistance-rated assemblies to protect.

Special inspection for firestop systems, joints and voids, has been in the IBC Chapter 17 for over 10 years. Firestop inspection is happening wherever special inspection is used by a jurisdiction.

This proposal adds a requirement to identify the system used to maintain fire-resistance of the assembly where the firestop system, fire-resistive joint system, or perimeter fire barrier occurs at the fire-resistance-rated assembly.

Both firestop installation contractors and firestop special inspection agency inspectors use the listing numbers in addition to manufacturers instructions to get the systems installed and inspected correctly.

There are literally thousands of system designs in the UL Product iQ, Intertek Directory, FM Approval Guide or other laboratory listing system. Knowing the system or engineering judgement/equivalent fire-resistance-rated assembly number installed at the jobsite speeds up the special inspection agency inspector's work by eliminating the need to figure out what system number. The listing number identifies the materials and systems that were used. The Special Inspector then simply looks up the systems during the inspections to compare the listing to the firestop system installation in the field. Huge efficiency gain.

Having the listing number at the penetrating item (joint or void) helps the building owner and manager compare the listings to the installations during the annual visual inspections required for the life cycle of the building. Having the identification device makes the firestop special inspection verification process and building owner's repair process much more cost efficient and effective.

Labeling items that protect breaches in fire-barriers (and other fire-resistance-rated assemblies) is used with other fire-resistance-rated

assemblies. In Section 703.5, Marking and Identification, the walls are identified. Fire doors and frames have labels. Fire dampers have identification labels. Fire rated glazing is identified with a mark on the glazing as well. Labelling firestop systems installed in the field is consistent with the requirements for the fire-resistance-rated wall assembly and breach protection items.

This Firestop Identification Device - used under the WK70416, New Practice for On-Site Identification of Penetration Firestop Systems and Fire-Resistive Joint Systems and Perimeter Fire Barriers, provides confidence that the appropriate level of protection is provided, and provides efficiency at inspection as well as during the annual visual inspection during the building life cycle.

Cost Impact: Increase

Estimated Immediate Cost Impact:

This code proposal will increase the cost of construction by about $0.10 per label.

Estimated Immediate Cost Impact Justification (methodology and variables):

The number of labels varies considerably based on type of building and type of occupancy. The ASTM WK 704016, New Practice for On-Site Identification of Penetration Firestop Systems and Fire-Resistive Joint Systems and Perimeter Fire Barriers, allows grouping of penetrations to get one label, vs. the non standard way which has no rules and might mandate that ALL penetrations are labeled. Where special inspection takes place, inspections are faster due to work looking up listings being reduced significantly.

Estimated Life Cycle Cost Impact:

Since the labels are permanent, there should not be extra expense to maintain them.

Estimated Life Cycle Cost Impact Justification (methodology and variables):

See standard ASTM WK 704016, New Practice for On-Site Identification of Penetration Firestop Systems and Fire-Resistive Joint Systems and Perimeter Fire Barrier.

FS40-24

FS41-24

IBC: 714.2 (New), 715.2 (New)

Proponents: Robert Marshall, FCAC, FCAC (fcac@iccsafe.org)

2024 International Building Code

Add new text as follows:

714.2 System variations. Where variations between the installed system and the tested through- or membrane-penetration firestop system exist, sufficient documentation shall be provided to the building official to show that the required ratings are not reduced.

715.2 System variations. Where variations between the installed system and the tested fire-resistant joint system, perimeter fire containment system or continuity head-of wall system exist, sufficient documentation shall be provided to the building official to show that the required ratings are not reduced.

Reason: Despite the fact there are over 10,000 individual firestop systems, fire-resistant joint systems, perimeter fire containment systems and continuity head-of-wall systems, each with multiple construction variations tested as required by the IBC, field conditions frequently occur for which there are no tested system available. These two new sections are intended to address how these unique installations need to be addressed between the design professional, the contractor and the code official. The language proposed emulates the language contained in existing Section 703.2.1.4 other than the fact it addresses all variations and not just supplemental features. For example, it would cover situations where a required component of a tested assembly is not installed, or where some feature not described is installed.

The sufficient documentation required is normally provided in the form of an equivalent firestop system obtained from some knowledgeable party. This process is a necessary and well-established program used on a daily basis in the firestopping industry when not tested systems are available. Industry practice has been to use the equivalent firestop system process only when a tested system is not available.

FCAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2023 and early 2024 the FCAC has held several virtual meetings and one in-person meeting open to any interested party. In addition, there were numerous virtual Working Group meetings for the current code development cycle, which included members of the committee as well as interested parties. Related documents and reports are posted on the **FCAC Website**

Cost Impact: Decrease

Estimated Immediate Cost Impact:

$0.00

Estimated Immediate Cost Impact Justification (methodology and variables):

Alternative means and methods submissions are costly to prepare. However, it has been common practice for AHJ's to accept either a system variation (e.g. engineering judgment) provided by the manufacturer, or a system variation stamped by a professional engineer to cover the installation. Manufacturers provide system variations at no cost. Even where an AHJ requires an Engineer's seal, this is still less costly than an alternative means and methods submission.

Using system variations as proposed will eliminate the need for a costly alternative means and methods submittal. Manufacturers provide system variations (e.g. engineering judgments) at no cost. If an AHJ requires an Engineer's seal, the cost can range is from $1000 to $2000 depending on the area of the country.

FS42-24

IBC: SECTION 202 (New), 714.2, 714.2.1 (New), 715.2, 715.2.3 (New)

Proponents: William Koffel, Koffel Associates, Inc., Firestop Contractors International Association (FCIA) (wkoffel@koffel.com)

2024 International Building Code

Add new definition as follows:

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

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

Add new text as follows:

714.2.1 Firestop identification devices. Penetration firestop systems shall be permanently identified with a device, label or similar treatment. The device shall be handwritten with permanent ink, or pre-printed, legible tag or label, or format readable by an electronic device and readable from a distance of 24 in. (610 mm) at a 45-degree angle. 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. "Warning, Penetration Firestop System - Do Not Remove or Tamper.

Adhesive or mechanically attached Identification devices shall be located within 6 in. (150 mm) below or beside the penetration firestop system edge, on the bottom of a horizontal assembly, or on both sides of a vertical barrier. For multiple penetrations of the same listing number arranged within 6 in. (150 mm) of each other, the device shall be located centered under or within 6 in. (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 in. (150 mm) of the assembly.

Revise as follows:

715.2 Installation.
Systems or materials protecting *joints* and voids shall be installed in accordance with Sections 715.2.1 and ~~715.2.2~~ 715.2.3.

Add new text as follows:

715.2.3 Firestop identification devices. Joint and void protection shall be permanently identified with a device, label or similar treatment. The device shall be handwritten with permanent ink, or pre-printed, legible tag or label, or format readable by an electronic device readable from a distance of 24 in. (610 mm) at a 45-degree angle, 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. "Warning, Joint and Void Protection System - Do Not Remove or Tamper.

Adhesive or mechanically attached Identification devices shall be located within 6 in. (150 mm), of the joint and void system edge.

Reason: Installing penetration firestop systems looks as easy as applying red caulk into the annular space of a penetration or gap, breach created for a joint or void. Firestop systems are very complex, detailed listed systems that take understanding of the tolerances so

they work when called upon by fire. Firestop systems are not easy to install once the listings are introduced to the installation – which is the only way to install and inspect firestopping.

The proposal adds a requirement to identify the system used to maintain fire-resistance of the assembly where a breach was made to pass penetrating item(s). This is a way for the firestop installation contractor to make others aware of what was installed. Knowing the system or engineering judgement/equivalent fire-resistance-rated assembly installed speeds up the special inspection agency inspector's work by eliminating the need to look up systems during the inspections. It also helps the building owner and manager compare the listings to the jobsite installations during the annual visual inspections required for the life cycle of the building.

This firestop system identification system allows all parties to understand what listing has been used, which then identifies the manufacturer's materials used in the system. The listing identifies the penetrating item(s), annular space size limitations, firestop material manufacturer, and assemblies to protect.

The assemblage of materials designed to keep fire from spreading outside a fire resistance rated assembly needs to be properly installed, inspected and maintained. The identification device makes the firestop special inspection verification process much more cost efficient and effective.

Labeling items at fire-barriers is consistent with other fire-resistance-rated assemblies. In Section 703.5, Marking and Identification, the walls are identified. Fire doors, fire dampers, and fire rated glazing are identified as well. The firestop labelling would be consistent with the requirements for the fire-resistance-rated wall assembly. This identification device provides confidence that the appropriate level of protection is provided, and the fire-resistance-rated design maintained easily.

Cost Impact: Increase

Estimated Immediate Cost Impact:

The identification device cost per penetration firestop system is approximately $0.10 US per penetration.

Estimated Immediate Cost Impact Justification (methodology and variables):

The cost increase is limited because the worker is already at the assembly, climbing a ladder or on a lift, with the materials, installing the system. All that needs to happen is adding the identification device, usually a label or tag. However, the device lowers the cost of inspection during construction and annual visual inspection because it saves the inspector time sorting through listings to find the right listing which was used.

FS42-24

FS43-24

IBC: SECTION 202 (New), 714.2, 715.2, 715.2.1

Proponents: William Koffel, Koffel Associates, Inc., Firestop Contractors International Association (FCIA) (wkoffel@koffel.com)

2024 International Building Code

Add new definition as follows:

MANUFACTURER'S INSTALLATION INSTRUCTIONS. Printed instructions included with materials, systems, or equipment.

Revise 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. *Manufacturer's installation instructions* and listings shall be available on the job site at the time of installation and inspection.

715.2 Installation.
Systems or materials protecting *joints* and voids shall be installed in accordance with Sections 715.2.1 and 715.2.2.*Manufacturer's installation instructions* and listings shall be available on the job site at the time of installation and inspection.

715.2.1 ~~List~~ Listed system installation.
Listed fire-resistant joint systems, perimeter fire containment systems and *continuity head-of-wall systems* 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.

Reason: The International Residential Code contains a definition for manufacturer's installation instructions. The proposed definition is similar to, but not identical, to the definition in the IRC. Throughout the IBC, there are multiple references to installation instructions, manufacturer's installation instructions, and manufacturer's instructions, yet there is no definition in the Code and the dictionary is of little value.

The IMC contains a requirement that the manufacturer's installation instructions must be present on the jobsite.

IMC - 304.1 General. *Equipment and appliances shall be installed as required by the terms of their approval, in accordance with the conditions of the listing, the manufacturer's installation instructions and this code. Manufacturer's installation instructions shall be available on the job site at the time of inspection.*

Firestop systems including penetrations, joints and voids, perimeter fire containment, must be installed in accordance with the manufacturer's installation instructions and the listing, where such systems are listed, to achieve the published F, T and L Ratings. The firestop systems protect breaches made in fire-resistance-rated assemblies to allow penetrating items to pass into or through the barrier, with or without independent movement between the penetrating item and the barrier. In firestopping, there are no 'generic' installations, only listings tested to prove the combination of products can achieve the required ratings. If the listings and manufacturer's installation instructions are not on the project site, neither the firestop installation contractor, the special inspection agency inspector, or the code official will know what is being installed or inspected, causing a life/fire safety risk.

Cost Impact: The change proposal is editorial in nature or a clarification and has no cost impact on the cost of construction

Justification for no cost impact:

Providing the manufacturer's installation instructions on a job site are essential but should not result in an increase in cost. It is possible that the cost of construction could decrease by enabling more efficient inspections by code officials or special inspectors.

FS44-24

IBC: 714.2.1 (New), 715.2.3 (New)

Proponents: William Koffel, Koffel Associates, Inc., Firestop Contractors International Association (FCIA) (wkoffel@koffel.com)

2024 International Building Code

Add new text as follows:

714.2.1 Installer Qualifications. In high-rise buildings, in buildings assigned to Risk Category III or IV, or in fire areas containing Group R occupancies with an occupant load greater than 250, penetration firestop systems shall be installed by contractors qualified by a Nationally Recognized Testing Laboratory.

Exceptions:

1. Where the work is of a minor nature as approved by the code official.
2. Where the work is a Repair or Alternation Level 1 as defined by the International Existing Building Code.

715.2.3 Installer Qualifications. In high-rise buildings, in buildings assigned to Risk Category III or IV, or in fire areas containing Group R occupancies with an occupant load greater than 250, fire-resistant joint systems shall be installed by contractors qualified by a Nationally Recognized Testing Laboratory.

Exceptions:

1. Where the work is of a minor nature as approved by the code official.
2. Where the work is a Repair or Alternation Level 1 as defined by the International Existing Building Code.

Reason: The cost to participate in such programs is minimal to a company that is truly in the firestop installation contracting business. The firestop contractor that understands systems selection, analysis, the listings and manufacturers installation instructions gets the penetration firestop systems installed correctly the first time at the correct price.

The firestop installation contractor that does not know the industry protocol installs 'fire caulk' and not systems. That firestop installation contractor is not providing the work result demanded by the code and will be non-compliant, meaning the true cost of installation is currently incorrect, even though the installation might ‘pass inspection’. When installing certain systems incorrectly, the cost difference can be 10 to 50 times the initial cost. Some installations are 10% more, and some 10 to 20 times more expensive.

Special inspection was added in the 2012 version of the IBC and is starting to get used more and more. With an unqualified installation contractor, the price for inspection increases significantly as deviations from listings are discovered and installations fail inspection, meaning the inspector has to look at installations much more. It causes the firestop installation contractor to go back and redo firestopping, slowing job progress.

The cost to get FM 4991 Approved or UL Qualified is spread across multiple projects.

There are enough FM 4991 Approved and UL Qualified Firestop Contractors nationally serving major, regional and small cities that have these types of buildings. The large number of approved and qualified contractors can provide competitive costs for the general contractor, building owner and manager for firestop installations.

Cost Impact: The change proposal is editorial in nature or a clarification and has no cost impact on the cost of construction

Justification for no cost impact:

The proposal could result in an increased cost for some projects, but it will likely decrease the cost of any special inspections. The firestop contractor that understands system selection, analysis, the listings, and manufacturer's installation instructions will more likely get the firestop system installed correctly the first time, at the quoted price. A contractor who does not know the industry protocol and code requirements will more likely result in high special inspection costs, rejections, repairs, and replacement, which will increase the cost.

FS45-24

IBC: 602.1, 714.4

Proponents: Quyen Thai, City of Tacoma, Washington Association of Building Officials Technical Code Development Committee (qthai@cityoftacoma.org); Micah Chappell, Seattle Department of Construction and Inspections, Washington Association of Building Officials Technical Code Development Committee (micah.chappell@seattle.gov); Julius Carreon, City of Bellevue, Washington Association of Building Officials Technical Code Development Committee (jcarreon@bellevuewa.gov); Hoyt Jeter, City of Tacoma, City of Tacoma (hjeter@cityoftacoma.org)

2024 International Building Code

Revise as follows:

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

714.4 Fire-resistance-rated walls.
Penetrations into or through *fire walls*, *fire barriers*, *smoke barrier* walls, ~~and~~ *fire partitions,* and bearing walls required to be rated by other provisions of this code shall comply with Sections 714.4.1 through 714.4.3. Penetrations in *smoke barrier* walls shall also comply with Section 714.5.4.

Reason: Membrane penetration protection in rated bearing walls have been inconsistent with its enforcement. Designers and contractors have been arguing that jurisdictions have not required it while others have since the code does not specifically identify this requirement even though it is the intent. This proposal is to bring clarity that protection of membrane penetration through a rated bearing wall must be protected. ICC staff, has in the past, provided similar interpretation to building officials.

Cost Impact: The change proposal is editorial in nature or a clarification and has no cost impact on the cost of construction

Justification for no cost impact:

Since this proposal is more of a clarification on a code interpretation that most jurisdictional members are already requiring with a few that have gone either direction in the interpretation, this will not increase or decrease the cost of construction. This code proposal is for clarification and interpretation only.

FS46-24

IBC: 714.4.1, 714.5.1

Proponents: Robert Marshall, FCAC, FCAC (fcac@iccsafe.org)

2024 International Building Code

Revise as follows:

714.4.1 Through penetrations.

Through penetrations of fire-resistance-rated walls shall comply with Section 714.4.1.1 or 714.4.1.2.

Exception: Where the penetrating items are steel, ferrous or copper pipes, tubes or conduits, the *annular space* between the penetrating item and the fire-resistance-rated wall is permitted to be protected ~~by either of the following measures:~~

~~1.~~ In concrete or *masonry* walls where the penetrating item is a maximum 6-inch (152 mm) nominal diameter and the area of the opening through the wall does not exceed 144 square inches (0.0929 m^2), concrete, grout or *mortar* is permitted where installed the full thickness of the wall or the thickness required to maintain the *fire-resistance rating*.

~~2. The material used to fill the *annular space* shall prevent the passage of flame and hot gases sufficient to ignite cotton waste when subjected to ASTM E119 or UL 263 time-temperature fire conditions under a minimum positive pressure differential of 0.01 inch of water (2.49 Pa) at the location of the penetration for the time period equivalent to the *fire-resistance rating* of the construction penetrated.~~

714.5.1 Through penetrations.

Through penetrations of *horizontal assemblies* shall comply with Section 714.5.1.1 or 714.5.1.2.

Exceptions:

~~1. Penetrations by steel, ferrous or copper conduits, pipes, tubes or vents or concrete or *masonry* items through a single fire-resistance-rated floor assembly where the *annular space* is protected with materials that prevent the passage of flame and hot gases sufficient to ignite cotton waste when subjected to ASTM E119 or UL 263 time-temperature fire conditions under a minimum positive pressure differential of 0.01 inch of water (2.49 Pa) at the location of the penetration for the time period equivalent to the *fire-resistance rating* of the construction penetrated. Penetrating items with a maximum 6-inch (152 mm) nominal diameter shall not be limited to the penetration of a single fire-resistance-rated floor assembly, provided that the aggregate area of the openings through the assembly does not exceed 144 square inches (92 900 mm^2) in any 100 square feet (9.3 m^2) of floor area.~~

~~2~~1. Penetrations in a single concrete floor by steel, ferrous or copper conduits, pipes, tubes or vents with a maximum 6-inch (152 mm) nominal diameter, provided that the concrete, grout or *mortar* is installed the full thickness of the floor or the thickness required to maintain the *fire-resistance rating*. The penetrating items shall not be limited to the penetration of a single concrete floor, provided that the area of the opening through each floor does not exceed 144 square inches (92 900 mm^2).

~~3~~2. Penetrations by *listed* electrical boxes of any material, provided that such boxes have been tested for use in fire-resistance-rated assemblies and installed in accordance with the instructions included in the listing.

~~4~~3. Penetrations of concrete floors or ramps within parking garages or *structures* constructed in accordance with Sections 406.5 and 406.6 where the areas above and below the penetrations are parking areas.

Reason: The Annular Space Protection Material (ASPM) language being deleted in Section 714.4.1, Exception 2 and Section 714.5.1, Exception 1 is the language which mandated the protection of penetrations before the development of the fire test standards ASTM E814 and UL 1479 now referenced in the IBC. When the ASPM language was included in the 1979 Uniform Building Code, it was an attempt to describe the fire test procedure and the acceptance criteria all within one short paragraph of the code in the absence of a published test standard. The acceptance criteria incorporated into the code simply required the material protecting the annular space be securely installed and capable of maintaining its integrity when subjected to an ASTM E119 or UL 263 time-temperature fire exposure. That early language morphed into what we see in the IBC today. With the inclusion of ASTM E814 and UL 1479 into the three legacy codes in the early 90s, the ASPM language was retained as an exception to the use of the two fire test standards. Now 30 plus years later it is time to

delete this exception for the following reasons:

1. The important details on how that test is to be conducted are left up to the discretion of the testing laboratory. Items missing from this exception include the details of the furnace construction, the furnace size, the construction of the test sample, the instrumentation of the furnace and test assembly, the procedures for conducting the test, including how the cotton waste is to be conditioned and applied to the test sample. Without these details it is impossible to consistently and reproducibly conduct this fire test.
2. The retention of this test procedure establishes a two-tier performance level for firestopping. The ASPM criteria simply relates to the ignition of cotton waste. Tests conducted in accordance with ASTM E814 or UL 1479 require the system to maintain either an F (fire) rating or a T (temperature) rating, both of which require the system to meet the hose stream test following fire exposure. Firestop systems through horizontal assemblies, with some exceptions, are required by the IBC to maintain a T rating. The T rating limits the temperature on the unexposed side of the assembly to a 325°F temperature rise.
3. Since 1987, there is only one known series of fire tests conducted using this ASPM method.

The ASPM exceptions and the concrete, grout or mortar exceptions to Sections 714.4.1 and 714.5.1 are often thought of as being identical. That is not the case. These two exceptions in each of these two sections are unique and stand alone. The exceptions in Sections 714.4.1 and 714.5.1 covering the protection of metallic penetrants using concrete, grout or mortar are not revised in any way by this proposal. Now is the time to delete this antiquated test procedure.

FCAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2023 and early 2024 the FCAC has held several virtual meetings and one in-person meeting open to any interested party. In addition, there were numerous virtual Working Group meetings for the current code development cycle, which included members of the committee as well as interested parties. Related documents and reports are posted on the **FCAC Website**

Cost Impact: The change proposal is editorial in nature or a clarification and has no cost impact on the cost of construction

Justification for no cost impact:

The code change proposal will not increase or decrease the cost of construction. There are simply no tested systems which will be negated by the deletion of this antiquated test method. Design professionals and contractors will continue to use the over 7000 firestop systems, most containing multiple construction variations, tested in accordance with ASTM E814 or UL 1479.

FS46-24

FS47-24

IBC: 714.5, 714.5.1

Proponents: Robert Marshall, FCAC, FCAC (fcac@iccsafe.org)

2024 International Building Code

714.5 Horizontal assemblies.
Penetrations of a *fire-resistance-rated* floor, floor/ceiling assembly or the ceiling membrane of a roof/ceiling assembly not required to be enclosed in a *shaft* by Section 712.1 shall be protected in accordance with Sections 714.5.1 through 714.5.4.

Revise as follows:

714.5.1 Through penetrations.
Through penetrations of *horizontal assemblies* shall comply with Section 714.5.1.1 or 714.5.1.2.

Exceptions:

1. Penetrations by steel, ferrous or copper conduits, pipes, tubes or vents or concrete or *masonry* items through a single fire-resistance-rated floor assembly where the *annular space* is protected with materials that prevent the passage of flame and hot gases sufficient to ignite cotton waste when subjected to ASTM E119 or UL 263 time-temperature fire conditions under a minimum positive pressure differential of 0.01 inch of water (2.49 Pa) at the location of the penetration for the time period equivalent to the *fire-resistance rating* of the construction penetrated. Penetrating items with a maximum 6-inch (152 mm) nominal diameter shall not be limited to the penetration of a single fire-resistance-rated floor assembly, provided that the aggregate area of the openings through the assembly does not exceed 144 square inches (92 900 mm^2) in any 100 square feet (9.3 m^2) of floor area.
2. Penetrations in a single concrete floor by steel, ferrous or copper conduits, pipes, tubes or vents with a maximum 6-inch (152 mm) nominal diameter, provided that the concrete, grout or *mortar* is installed the full thickness of the floor or the thickness required to maintain the *fire-resistance rating*. The penetrating items shall not be limited to the penetration of a single concrete floor, provided that the area of the opening through each floor does not exceed 144 square inches (92 900 mm^2).
3. Penetrations by *listed* electrical boxes of any material, provided that such boxes have been tested for use in fire-resistance-rated assemblies and installed in accordance with the instructions included in the listing.
4. ~~Penetrations of concrete floors or ramps within parking garages or *structures* constructed in accordance with Sections 406.5 and 406.6 where the areas above and below the penetrations are parking areas.~~Vehicle ramps within or adjacent to parking garages or structures constructed in accordance with Sections 406.5 and 406.6 that are not used for vehicle parking do not require penetrations to comply with Section 714.5.1.1, 714.5.1.2 or 714.5.1.3.

Reason: During the 2021 to 2024 code cycle, Proposal No. FS64-21 introduced a new Exception 4 to Section 714.5.1 which permits unprotected penetrations through floors and ramps of both enclosed and open parking garages where the areas above and below the penetrations are parking areas. We believe this new exception is does not represent good fire protection practices and as such are proposing modifications to the scope of the exception.

The modifications being proposed are intended to limit the application of the exception to vehicle ramps serving parking garage where the ramps are not directly above or below the parking areas. This limitation will minimize the chances of a fire from below involving parked vehicles.

Parking garages often have penetrants (roof drains, electrical conduit, cables, etc.) extending vertically throughout multiple levels of the parking garage. The need to protect penetrations above or below parking areas is critical in preventing ignition of parked vehicles.

The construction of modern vehicles has changed to include more plastics and other combustibles. While this benefits the vehicle weight and fuel economy, and lowers the vehicle price, it increases the fuel load and fire growth we see in parking garages. Modern vehicles present new hazards due to the incorporation of larger quantities of combustible materials (e.g. fuels, plastics, synthetic materials, etc.) into their designs. Another recent vehicle construction change is the use of plastic fuel tanks. Plastic fuel tanks can result in an earlier release of fuel in a fire. Fire tests at Southwest Research Institute showed fuel leakage as a result of fire exposure occurs after less than

five minutes of fire exposure. Fuel spill fires represent a likely means of vehicle-to-vehicle fire spread.1 As alternative fuel vehicles are popularized, concerns regarding their unique hazards, burn characteristics, and typical burn duration have been raised. Compared to older vehicles, modern vehicles burn differently. At the same time, modern parking garages have optimized space requirements for vehicle parking and storage. It is clear that the design assumption of only one or two fire burning has to be revisited. Cars are larger and have more fuel load than before, and the parking spaces have become smaller. This enhances the probability of fire spread between vehicles.

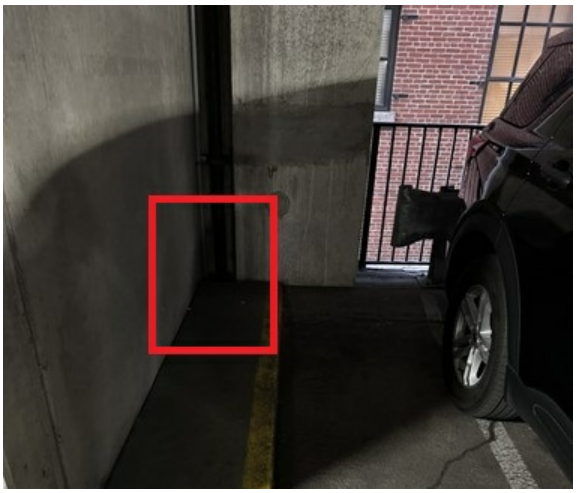
New electric vehicle battery and charging equipment technologies are also leading to much more rapid fire growth than previously contemplated in parking garage design. Fire accidents caused by the thermal runaway of lithium-ion battery have demonstrated that additional fire safety precautions are needed. It is particularly important to prevent these open and closed parking garage fires from occurring due to the challenges the fire services face in fighting parking garage fires.

There have been a number of recent cases and studies around the world that are demonstrating that fire safety in parking garages should be enhanced, not further reduced as done with Exception 4 of Section 714.5. In recent years, Europe has seen a series of large fires (Liverpool, UK (2017); Cork, Ireland (2018); Stavanger Airport in Sola, Norway (2020)1; Warsaw, Poland (2020)) that brought fires in parking garages into the focus of public discussions. In October, 2023, a major multi-storey parking garage fires occurred at the Luton Airport, London resulting in structural collapse.

A 2020 study on fires of electric vehicles concluded that in just 22 seconds, cell thermal runaway spreads flames throughout the battery compartment. A full-scale fire test was carried out on a battery system of seventeen 3P6S battery modules mounted with control systems in a car chassis. One battery module was overcharged until thermal runaway occurred. Within five seconds, thermal runaway spread to the four adjacent modules. Released gas was immediately ignited, with jet flame and smoke, and temperatures reached over 600 °C. These five modules then smouldered, and further modules ignited after around two minutes. The authors note that water fire suppression would be hindered by the battery pack casings.[1]

An NFPA Journal article published in 2019 indicated a typical garage fire today is much more likely to involve multiple vehicles than two decades ago, hinting that fires are in fact burning with more severity. In garage fires between 1995 and 1997, only 1 percent of fires involved more than five vehicles. By contrast, between 2010 and 2014, 8 percent of the garage fires involved more than five vehicles.[2]

The photos below show an example of a parking garage penetration. These photos were taken at the Marriott St Louis Grand Hotel multi-story parking garage. An approximate 12 in. by 12 in. opening was located approximately 4 ft from an adjacent parked car. By the 2024 IBC, this unprotected opening is permitted. Is the level of protection we should be permitting?



FCAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2023 and early 2024 the FCAC has held several virtual meetings and one in-person meeting open to any interested party. In addition, there were numerous virtual Working Group meetings for the current code development cycle, which included members of the committee as well as interested parties. Related documents and reports are posted on the **FCAC Website**

Cost Impact: Increase

Estimated Immediate Cost Impact:

The average cost of an installed firestop system for concrete floors is $35 - $50 per penetration.

Estimated Immediate Cost Impact Justification (methodology and variables):

The immediate cost impact estimate is based on industry and manufacturer input.This includes materials and labor costs for any type of penetrant through the floor assembly. The cost range includes, sealant based, intumescent, or mechanical devices. The total cost in any given parking garage will depend upon the number of penetrations.

FS47-24

FS48-24

IBC: 714.5, 714.5.1

Proponents: William Koffel, Koffel Associates, Inc., Firestop Contractors International Association (FCIA) (wkoffel@koffel.com)

2024 International Building Code

714.5 Horizontal assemblies.
Penetrations of a *fire-resistance-rated* floor, floor/ceiling assembly or the ceiling membrane of a roof/ceiling assembly not required to be enclosed in a *shaft* by Section 712.1 shall be protected in accordance with Sections 714.5.1 through 714.5.4.

Revise as follows:

714.5.1 Through penetrations.
Through penetrations of *horizontal assemblies* shall comply with Section 714.5.1.1 or 714.5.1.2.

Exceptions:

1. Penetrations by steel, ferrous or copper conduits, pipes, tubes or vents or concrete or *masonry* items through a single fire-resistance-rated floor assembly where the *annular space* is protected with materials that prevent the passage of flame and hot gases sufficient to ignite cotton waste when subjected to ASTM E119 or UL 263 time-temperature fire conditions under a minimum positive pressure differential of 0.01 inch of water (2.49 Pa) at the location of the penetration for the time period equivalent to the *fire-resistance rating* of the construction penetrated. Penetrating items with a maximum 6-inch (152 mm) nominal diameter shall not be limited to the penetration of a single fire-resistance-rated floor assembly, provided that the aggregate area of the openings through the assembly does not exceed 144 square inches (92 900 mm^2) in any 100 square feet (9.3 m^2) of floor area.
2. Penetrations in a single concrete floor by steel, ferrous or copper conduits, pipes, tubes or vents with a maximum 6-inch (152 mm) nominal diameter, provided that the concrete, grout or *mortar* is installed the full thickness of the floor or the thickness required to maintain the *fire-resistance rating*. The penetrating items shall not be limited to the penetration of a single concrete floor, provided that the area of the opening through each floor does not exceed 144 square inches (92 900 mm^2).
3. Penetrations by *listed* electrical boxes of any material, provided that such boxes have been tested for use in fire-resistance-rated assemblies and installed in accordance with the instructions included in the listing.
4. ~~Penetrations of concrete floors or ramps within parking garages or *structures* constructed in accordance with Sections 406.5 and 406.6 where the areas above and below the penetrations are parking areas.~~

Reason: During the 2024 code development cycle, Proposal No. FS64-21 introduced a new Exception 4 to Section 714.5.1 which permits unprotected penetrations through floors and ramps of both open and enclosed parking garages, where the areas above and below the penetrations are parking areas. FCIA believes the new exception does not represent good fire protection practices and as such are proposing the deletion of the exception.

Parking garages often have penetrants (roof drains, electrical conduit, cables, etc.) extending vertically throughout multiple levels of the parking garage. The need to protect penetrations above or below parking areas is critical in preventing floor-to-floor fire propagation and ignition of parked vehicles.

The construction of modern vehicles has changed to include more plastics and other combustibles (e.g. fuels, plastics, synthetic materials, etc.). While this benefits the vehicle weight and fuel economy, and lowers the vehicle price, it increases the fuel load and fire growth in parking garages.

Another recent vehicle construction change is the use of plastic fuel tanks. Plastic fuel tanks can result in an earlier release of fuel in a fire. Fire tests at Southwest Research Institute showed fuel leakage as a result of fire exposure occurs after less than five minutes of fire exposure. Fuel spill fires represent a likely means of vehicle-to-vehicle fire spread.[1]

As alternative fuel vehicles are popularized, concerns regarding their unique hazards, burn characteristics, and typical burn duration have been raised. Fuels such as propane, natural gas and hydrogen all create different hazards.

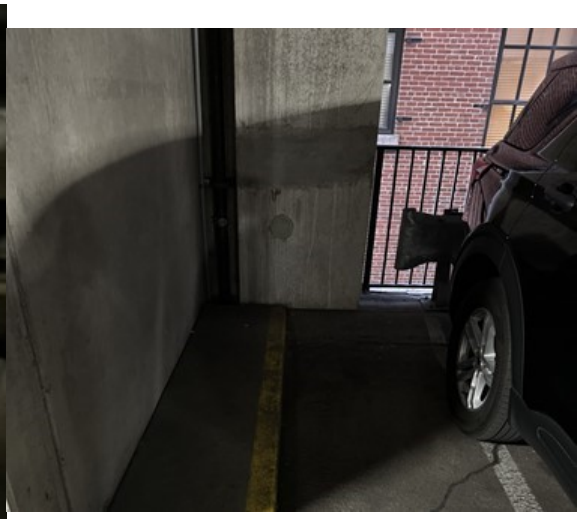
New electric vehicle battery and charging equipment technologies are also leading to much more rapid-fire growth than previously contemplated in parking garage design. Fire accidents caused by the thermal runaway of lithium-ion batteries have demonstrated that additional fire safety precautions are needed.

Compared to older vehicles, modern vehicles burn differently. At the same time, modern parking garages have optimized space requirements for vehicle parking and storage. It is clear that the design assumption of only one or two fire burning has to be revisited. Cars are larger and have more fuel load than before, and the parking spaces have become smaller. This enhances the probability of fire spread between vehicles – and possibly to the floor above.

It is particularly important to prevent fires in open and enclosed parking garage from occurring due to the challenges the fire services face in fighting parking garage fires.There have been a number of recent cases and studies around the world that are demonstrating that fire safety in parking garages should be enhanced, not further reduced as done with Exception 4 of Section 714.5. In recent years, Europe has seen a series of large fires (Liverpool, UK (2017); Cork, Ireland (2018); Stavanger Airport in Sola, Norway (2020)[1]; Warsaw, Poland (2020)) that brought fires in parking garages into the focus of public discussions. In October, 2023, a major multi-story parking garage fire occurred at the Luton Airport, London resulting in structural collapse.

A 2020 study on fires of electric vehicles concluded that in just 22 seconds, cell thermal runaway spreads flames throughout the battery compartment. A full-scale fire test was carried out on a battery system of seventeen 3P6S battery modules mounted with control systems in a car chassis. One battery module was overcharged until thermal runaway occurred. Within five seconds, thermal runaway spread to the four adjacent modules. Released gas was immediately ignited, with jet flame and smoke, and temperatures reached over 600°C. These five modules then smoldered, and further modules ignited after around two minutes. The authors note that water fire suppression would be hindered by the battery pack casings.[2]

An NFPA Journal article published in 2019 indicated a typical garage fire today is much more likely to involve multiple vehicles than two decades ago, hinting that fires are in fact burning with more severity. In garage fires between 1995 and 1997, only 1 percent of fires involved more than five vehicles. By contrast, between 2010 and 2014, 8 percent of the garage fires involved more than five vehicles.[3]The photos below show an example of a parking garage penetration. These photos were taken at the Marriott St. Louis, MO Grand Hotel multi-story parking garage. An approximate 12 in. by 12 in. opening was located about 4 ft. from an adjacent parked car. By the 2024 IBC, this unprotected opening is permitted. Is the level of protection we should be permitting?



It is now time to recognize the hazards of parking structures and delete the various exceptions which are eliminating the need to protect penetrations, joints and voids in open and enclosed parking garages. This proposal on penetrations parallels similar proposals covering joints and voids which will be heard separately.

Bibliography: 1 NFPA Research Foundation - Modern Vehicle Hazards in Parking Structures and Vehicle Carriers by Haavard Boehmer, PE, Michael Klassen, PhD, PE, Stephen Olenick, PE

2 Li, Huang, Peng, Wen, Yang, Xulai, Chen, Haodong, Sun, Jinhua, Wang, Qingsong, Full-Scale Experimental Study on the Combustion Behavior of Lithium Ion Battery Pack Used for Electric Vehicle Fire Technology, Volume 56- 6, November 01, 2020, https://doi.org/10.1007/s10694-020-00988-w

3 NFPA Journal - Protecting Parking Garages, Mar Apr 2019, Ramp Risk, By Jesse Roman.

Cost Impact: Increase

Estimated Immediate Cost Impact:

$35 - $50 per penetration or joint to be protected

Estimated Immediate Cost Impact Justification (methodology and variables):

The average cost of an installed firestop system for concrete floors based on input from contractors and manufacturers.

FS48-24

FS49-24

IBC: 714.5.2

Proponents: Jeffrey Grove, Southern Nevada ICC Chapter (jeff.grove@coffman.com)

2024 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 a maximum 2-hour fire-resistance-rated *horizontal assembly* is permitted to be interrupted with the double 2x 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. The ceiling membrane of a maximum 1-hour fire-resistance-rated horizontal assembly is permitted to be interrupted with a single 2x wood top plate of a wall assembly that is sheathed with Type X gypsum wallboard, provided that all penetrating items through the top plate 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.~~9. 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: The current code language merely requires a “double wood top plate”. As currently written, the top plate could consist of two ½” plywood strips or two 4x8s with no regard to the ability of the material to resist fire. The fact that a clarification statement needed to be added to the code commentary for this item is a clear indication this section needs to be revised. It is important to clarify exactly what the minimum is to achieve the continuity of the membrane rating at the penetration. This code change would allow for a single 2x top plate or a combination of a single 2x top plate with a 1x top plate as a minimum to add clarification to the section. An additional reason for this change is to allow for current construction methods. Standard construction methods in wood construction require a gap to be placed

between the bottom of the floor joists or truss and the top of a non-bearing partition. This allows for deflection of the truss without adverse loading from interference of a non-bearing partition. The standard method for creating this gap is to use a single 2x top plate with a 1x top plate to create a double top plate. Bearing walls and exterior walls are already required to use a double 2x top plate per IBC section 2308.9.3.2 and therefore are not generally affected by this code clarification.

Compliant nailing of the gypsum board can be maintained with a single 2x top plate. In a 1-hour assembly with a single layer of drywall, a single 2x top plate is sufficient to achieve drywall nailing. The standard 2x is 1 ½" thick. If you remove ⅝" for drywall, you are left with ⅞" of plate width for nailing. The required edge distance of a fastener in gypsum board is ⅜" per IBC Section 2508.6.3 allowing an edge distance of ½" on the plate. A standard joint at a stud in a fire rated wall would require ⅜" edge distance for each gypsum sheet leaving only ⅜" edge distance on each side of the stud. This shows that the proposed top plate configuration allows more nailing width than is required in the fire rated assembly.

In a 2 layer assembly, compliant nailing can be achieved with a 2x top plate with a 1x top plate. A 2x, which is 1 ½", and a 1x, which is ¾", will achieve a total top plate thickness of 2 ¼". If one subtracts 1 ¼" for 2 layers of ⅝" gypsum board from 2 ¼", there is 1" remaining. This will allow for ⅜" edge distance on the gypsum sheet as well as ⅝" edge distance on the top plate. This is also in excess of the minimums required for fire rated assemblies.

The 2x with a 1x plate application will also work with resilient channel (RC) and a single layer of gypsum board. The RC is ½" plus the ⅝" gypsum board for a total of 1 ⅛" leaving ¾" of edge distance on the top plate after subtracting the ⅜" drywall edge distance. This would even allow for a full ¾" RC without degrading the fire rating of the assembly.

The order of nailing can also be modified to provide even more edge distance. If the wall sheathing is nailed first, the installer could take full advantage of the entire top plate thickness for edge distance. The ceiling membrane could then be butted tightly to the wall sheathing to achieve the rating. This configuration is demonstrated in U.L. listed assembly system number F-C-2387.

The single wood top plate exceeds the fire resistance of a single layer of ⅝" gypsum board. IBC table 722.6.2(1) assigns a 40 minute rating to ⅝" type x gypsum wall board on wood frame. Table 16.2.1A of the ANSI/AWC National Design Specification for Wood Construction (NDS), as referenced in IBC Section 722.1, assigns a 1-hour char rating to 1 ½" of sawn lumber. Utilizing a single 2x wood top plate as a membrane penetration in a 1 hour application does not reduce the fire resistance rating of the assembly.

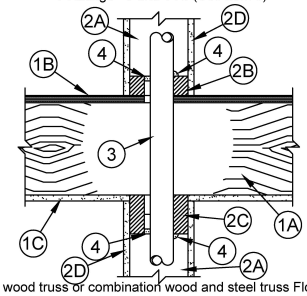
Testing has been performed on this condition and there are currently listed assemblies available. One listing is Specified Technologies Inc. system number F-C-2014 which allows for a single 2x4 or 2x6 top plate. Another listing is 3M system number F-C-2387 which also allows for a single 2x4 or 2x6 top plate. Both of these listings are approved by Underwriters Laboratories to maintain the fire rating of the floor ceiling assembly. It is inappropriate to eliminate options from the code that have been proven by testing to meet the fire resistant requirements.

This proposed change does not limit the design of the building. The design professionals are still free to use a double top plate including 2x and 3x in any situation they deem necessary. This merely allows flexibility for the designer to use different methods while still achieving the required fire ratings.

Classified by
Underwriters Laboratories, Inc.
to ASTM/UL1479 (ASTM E814)

System No. F-C-2014

F Rating - 1 Hr
T Ratings - 0 and 1 Hr (See Item 3)



1. **Floor Assembly -** The 1 hr fire rated wood truss or combination wood and steel truss Floor-Ceiling assembly shall be constructed of the materials and in the manner described in the individual L500 Series Design in the UL Fire Resistance Directory, as summarized below:
   A. **Joists -** Nom 10 in. (254 mm) deep (or deeper) lumber, steel or combination lumber and steel joists, trusses or **Structural Wood Members*** with bridging as required and with ends firestopped.
   B. **Flooring System -** Lumber or plywood subfloor with finish floor of lumber, plywood or **Floor Topping Mixture*** as specified in the individual Floor-Ceiling Design. Diam of opening in flooring shall be 3/16 to 5/8 in. (5 to 16 mm) larger than the outside diam of nonmetallic pipe or conduit (Item 3).
   C. **Gypsum Board* -** Thickness, type, number of layers and fasteners shall be as specified in the individual Floor-Ceiling Design. Diam of opening shall be 3/16 to 5/8 in. (5 to 16 mm) larger than the outside diam of nonmetallic pipe or conduit (Item 3).
2. **Chase Wall -** (Optional) - The through penetrants (Item 3) may be routed through a single, double or staggered wood stud/gypsum board chase wall and shall include the following construction features:
   A. **Studs -** Nom 2 by 4 in. (51 by 102 mm), 2 by 6 in. (51 by 152 mm), 2 by 8 in. (51 by 203 mm) or double nom 2 by 4 in. (51 by 102 mm) lumber studs.
   B. **Sole Plate -** Nom 2 by 4 in. (51 by 102 mm) or 2 by 6 in. (51 by 152 mm) lumber plates or double nom 2 by 4 in. (51 by 102 mm) lumber plates tightly butted together. Diam of opening shall be 3/16 to 5/8 in. (5 to 16 mm) larger than the outside diam of nonmetallic pipe or conduit (Item 3).
   C. **Top Plate -** The single or double top plate shall consist of one or two nom 2 by 4 in. (51 by 102 mm) or 2 by 6 in. (51 by 152 mm) lumber plates or one or two sets of nom 2 by 4 in. (51 by 102 mm) lumber plates tightly butted together. Diam of opening shall be 3/16 to 5/8 in. (5 to 16 mm) larger than the outside diam of nonmetallic pipe or conduit (Item 3).
   D. **Gypsum Board* -** Min 1/2 in. thick rated or non-rated gypsum board.
3. **Through Penetrant -** One nonmetallic pipe or conduit to be installed concentrically or eccentrically within the firestop system. Annular space between pipe or conduit and edge of opening to be min 0 in. (point contact) to max 1/2 in. (0 to 13 mm). Pipe to be rigidly supported on both sides of floor-ceiling assembly. The following types and sizes of nonmetallic pipes may be used:
   A. **Polyvinyl Chloride (PVC) Pipe -** Nom 2 in. (51 mm) diam (or smaller) Schedule 40 solid or cellular core PVC pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems.
   B. **Chlorinated Polyvinyl Chloride (CPVC) Pipe -** Nom 2 in. (51 mm) diam (or smaller) SDR13.5 CPVC pipe for use in closed (process or supply) piping systems.

   Note: When the annular space is min 1/2 in. T Rating is 1 hr, otherwise the T Rating is 0 Hr.
4. **Fill, Void or Cavity Materials* - Caulk -** Min 1/2 in. (13 mm) thickness of fill material applied within the annulus, flush with top surface of sole plate or subfloor. Min 1/2 in. (13 mm) thickness of fill material applied within the annulus, flush with bottom surface of top plate or gypsum board. At the point contact location or when the annulus between the through penetrant and sole plate or subfloor or top plate or gypsum board is 1/8 in. (3 mm) or less, min 1/2 in. (13 mm) diam bead of fill material applied at the through penetrant/sole plate interface or penetreant/top plate or gypsum board interface.

   SPECIFIED TECHNOLOGIES INC - Type WF300 Caulk

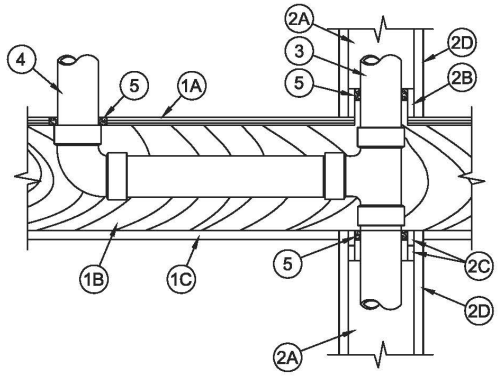
*** Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada), respectively.**

Specified Technologies Inc. 210 Evans Way Somerville, NJ 08876

Created or Revised: June 05, 2015
(800)992-1180 • (908)526-8000 • FAX (908)231-8415 • E-Mail:techserv@stifirestop.com • Website:www.stifirestop.com

System No. F-C-2387

March 20, 2009
F Rating – 1 Hr
T Rating – 0 Hr



1. **Floor Assembly** – The 1 hr fire rated wood truss or combination wood and steel truss Floor-Ceiling assembly shall be constructed of the materials and in the manner described in the individual L500 Series Design in the UL Fire Resistance Directory, as summarized below:
   A. **Flooring System** – Lumber or plywood subfloor with finish floor of lumber, plywood or **Floor Topping Mixture*** as specified in the individual Floor-Ceiling Design. Diam of opening shall be 1/2 in. to 1 in. (13 to 25 mm) larger than the outside diam of nonmetallic pipe (Items 3 and 4).
   B. **Joists** – Nom 10 in. (254 mm) deep (or deeper) lumber, steel or combination lumber and steel joists, trusses or **Structural Wood Members*** with bridging as required and ends firestopped.
   C. **Gypsum Board*** – Nom 4 ft (1.2 m) wide by 5/8 in. (16 mm) thick, attached as described in the individual Floor-Ceiling Design.
2. **Chase Wall** – The through penetrant (Item No. 3) shall be routed through a single, double or staggered wood studs/gypsum board chase wall and shall include the following construction features:
   A. **Studs** – Nom 2 by 4 in. (51 by 102 mm) or 2 by 6 in. (51 by 152 mm) lumber studs.
   B. **Sole Plate** – Nom 2 by 4 in. (51 by 102 mm) or 2 by 6 in. (51 by 152 mm) lumber plates. Diam of opening or length of notch-out in sole plate to be 1/2 in. to 1 in. (13 to 25 mm) larger than outside diam of pipe.
   C. **Top Plate** – The single or double top plate shall consist of one or two nom 2 by 4 in. (51 by 102 mm) or 2 by 6 in. (51 by 152 mm) lumber plates. Diam of opening or length of notch-out in top plate to be 1/2 in. to 1 in. (13 to 25 mm) larger than outside diam of pipe.
   D. **Gypsum Board** – Min ½ in. thick rated or nonrated gypsum board.
3. **Through Penetrant** – One nonmetallic pipe to be installed within the firestop system. Pipe to be rigidly supported on both sides of floor-ceiling assembly. The annular space between pipe and periphery of opening shall be min 0 in. (point contact) to max 1/2 in. (0 to max 13 mm). The following types and sizes of nonmetallic pipes may be used:
   A. **Polyvinyl Chloride (PVC) Pipe** – Nom 3 in. (76 mm) diam (or smaller) Schedule 40 solid core PVC pipe for use in closed (process or supply) or vented (drain, waste or vent) piping system.
   B. **Cellular Core Polyvinyl Chloride (ccPVC)** Pipe – Nom 3 in. (76 mm) diam (or smaller) Schedule 40 cellular core PVC pipe for use in closed (process or supply) or vented (drain, waste or vent) piping system.
   C. **Acrylonitrile Butadiene Styrene (ABS) Pipe** – Nom 3 in. (76 mm) diam (or smaller) Schedule 40 solid core ABS pipe for use in closed (process or supply) or vented (drain, waste or vent) piping system.
   D. **Cellular Core Acrylonitrile Butadiene Styrene (ccABS) Pipe** – Nom 3 in. (76 mm) diam (or smaller) Schedule 40 cellular core ABS pipe for use in closed (process or supply) or vented (drain, waste or vent) piping system.
   E. **Chlorinated Polyvinyl Chloride (CPVC) Pipe** – Nom 3 in. (76 mm) diam (or smaller) SDR13.5 CPVC pipe for use in closed (process or supply) piping systems.
4. **Branch Piping** – (Optional) – One nonmetallic pipe to be connected to through penetrant (Item 3) and installed within opening in subfloor. The annular space between pipe and periphery of opening shall be min 0 in. (point contact) to max 1/2 in. (13 mm). The following types and sizes of nonmetallic pipes may be used:
   A. **Polyvinyl Chloride (PVC) Pipe** – Nom 3 in. (76 mm) diam (or smaller) Schedule 40 solid core PVC pipe for use in closed (process or supply) or vented (drain, waste or vent) piping system.

System No. F-C-2387 *continued*

B. **Cellular Core Polyvinyl Chloride (ccPVC) Pipe** – Nom 3 in. (76 mm) diam (or smaller) Schedule 40 cellular core PVC pipe for use in closed (process or supply) or vented (drain, waste or vent) piping system.

C. **Acrylonitrile Butadiene Styrene (ABS) Pipe** – Nom 3 in. (76 mm) diam (or smaller) Schedule 40 solid core ABS pipe for use in closed (process or supply) or vented (drain, waste or vent) piping systems.

D. **Cellular Core Acrylonitrile Butadiene Styrene (ccABS) Pipe** – Nom 3 in. (76 mm) diam (or smaller) Schedule 40 cellular core ABS pipe for use in closed (process or supply) or vented (drain, waste or vent) piping system.

5. **Fill, Void or Cavity Materials*** – **Caulk or Sealant** – Min 3/4 in. (19 mm) thickness of caulk applied within annular space around perimeter of through penetrant (Item 3), flush with top surface of floor or sole plate and flush with bottom surface of lower top plate. Min 3/4 in. (19 mm) thickness of caulk applied within annular space around perimeter of branch piping (Item 4), flush with top surface of floor. Min 1/2 in. (13 mm) diam bead applied at the pipe/floor interface.

3M COMPANY
3M FIRE PROTECTION PRODUCTS – CP 25WB+ caulk, IC 15WB+ caulk or FB-3000 WT sealant
(Note: CP 25WB+ not suitable for use with CPVC pipes.)

*Bearing the UL Classification Mark

Bibliography: Specified Technologies System No. F-C-2014

3M Fire Protection Products System No. F-C-2387

Cost Impact: The change proposal is editorial in nature or a clarification and has no cost impact on the cost of construction

Justification for no cost impact:

The code change proposal is not anticipated to increase or decrease the cost of construction This code change proposal is to clarify the intent of the original code change that brought this exception into the code.

FS49-24

FS50-24

IBC: 714.5.2, 714.5.2.1 (New)

Proponents: Jonathan Roberts, UL Solutions, UL Solutions (jonathan.roberts@ul.com)

2024 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.Membrane penetrations by luminaires shall comply with Section 714.5.2.1. ~~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 a maximum 2-hour fire-resistance-rated *horizontal assembly* 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.~~

Add new text as follows:

714.5.2.1 Membrane penetrations by luminaires. Penetrations of membranes that are part of a *horizontal assembly* by luminaires (light fixtures) shall comply with one of the following:

1. Luminaires *listed* and *labeled* for use in fire-resistance rated assemblies. The listing shall indicate that the luminaire is suitable for installation in the *horizontal assembly* penetrated with a fire-resistance rating not less than the required rating of the *horizontal assembly* penetrated.
2. Luminaires tested for use in a fire-resistance rated assemblies and are installed in accordance with tested assembly construction specifications.

3. Luminaires protected by an enclosure *listed* and *labeled* for use in fire-resistance designs certified by an *approved agency*.

Reason: This proposal accomplishes the following:

1. Section 714.5.2 currently covers two distinctly different requirements, (a) exceptions to the basic membrane penetration requirements and (b) description of how to cover penetrations by luminaires. This proposal separates the legacy exceptions from the distinctly different luminaire protection requirements, which move to a new 714.5.2.1

2. Section 714.5.2 has been revised to only cover exceptions 1 through 7, and remove reference to luminaires.

3. Section 714.5.2.1 now covers acceptable methods for addressing membrane penetrations by luminaires as follows:

Item 1 covers luminaires that are listed and labeled for use in fire-resistance rated horizontal assemblies. The reference to the listing indicating that the luminaire is suitable for the horizontal assembly penetrated is consistent with how these products are listed. Additional information on this can be found in the guide information for Luminaires, Luminaire Assemblies and Luminaire Enclosures Certified for Fire Resistance (CDHW).

Item 2 addresses the requirements that were previously in exception 8 in a more concise fashion. The reference in exception 8 allowing "luminaires protected with listed materials" was eliminated because we are not aware of materials that have been listed for this application.

Item 3 addresses the requirements for enclosures that have been tested for use in specific fire-resistance rated horizontal designs. The approved agency language is consistent with Section 703.2.2(5).

4. The ambiguous requirement in 713.5.2 that indicate "recessed fixtures shall be installed such that the required fire resistance will not be reduced" has been replaced in 714.5.2.1 with more definitive wording.

Cost Impact: The change proposal is editorial in nature or a clarification and has no cost impact on the cost of construction

Justification for no cost impact:

Listing for luminaires (light fixtures) that are membrane penetrations regulated by this section of the code currently have a "listing" option (part of the list of exceptions) for compliance with the requirement to maintain fire resistance. As listing as an option is currently included in this code, so there is no additional cost impact. The proposal is a simple editorial revision to provide clarity for the code official with the methods by which to determine code compliance.

FS50-24

FS51-24

IBC: 714.5.4

Proponents: Robert Marshall, FCAC, FCAC (fcac@iccsafe.org)

2024 International Building Code

Revise as follows:

714.5.4 Penetrations in smoke barriers.
Penetrations in *smoke barriers* shall be protected by an *approved through-penetration firestop system* installed and tested in accordance with the requirements of UL 1479 for air leakage. The *L rating* of the system measured at 0.30 inch of water (74.7 Pa) in both the ambient temperature and elevated temperature tests shall meet one ~~not exceed either~~ of the following:

1. A maximum 5.0 cfm per square foot (0.025 $m^3/s \times m^2$) of penetration opening for each *through-penetration firestop system*.
2. A maximum ~~total~~ cumulative leakage of 50 cfm (0.024 m^3/s) for all through-penetration firestop systems within any 100 square feet (9.3 m^2) of wall area, or floor area.

Reason: This proposal corrects a long-standing misunderstanding relating to the inter-relationship of the two criteria of Section 715.5.4. The first criteria, relating to the leakage of each individual system, was added to the 2006 IBC under Proposal FS96-04/05. The second criteria, relating to the cumulative leakage was added to the 2009 IBC under Proposal FS99-07/08. The intent of FS99-07/08, as stated in Tony Crimi's Public Comment Reason statement was to "…retain the existing 5.0 cfm/ft2 for individual through penetrations as one option, but … allow a new alternative requirement for the cumulative total leakage of all through-penetrations in a smoke barrier." The logic was there are certain types of penetrations, such as bundled cables, which inherently have a significant leakage and will not meet the original (first) criteria of 5.0 cfm per square foot of penetration opening. The new (second) criteria then looks at the leakage wholistically as the leakage over a relatively large area. One, or maybe more, of the systems not meeting the 5.0 CFM per square foot may be used as long as the cumulative leakage does not exceed 50 cfm for any 100 square foot area.

In retrospect, the language chosen at in FS99-07/08 was confusing at best. It stated the L rating shall not exceed the first criteria or the second criteria. This could certainly be interpreted as meaning the leakage must meet both criteria which was not the original intent. The 2018 IBC was then revised to state the L rating shall not exceed either the first criteria or the second criteria. We have been unable to identify the specific proposal which prompted this change so presumably it was done by ICC staff as an editorial clarification based on what they thought was the meaning of the 2015 IBC. However, it was in direct conflict with the original Reason statement of FS99-07/08.

This proposal then will align the code language to the original intent of FS99-07/08.

FCAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2023 and early 2024 the FCAC has held several virtual meetings and one in-person meeting open to any interested party. In addition, there were numerous virtual Working Group meetings for the current code development cycle, which included members of the committee as well as interested parties. Related documents and reports are posted on the **FCAC Website**

Cost Impact: The change proposal is editorial in nature or a clarification and has no cost impact on the cost of construction

Justification for no cost impact:

This will not increase the cost of construction as it is simply a clarification that only one of the criteria must be met to satisfy the L rating. As currently written, it can be misinterpreted to require both.

FS52-24

IBC: 714.5.4

Proponents: Jonathan Roberts, UL Solutions, UL Solutions (jonathan.roberts@ul.com); Richard Walke, Creative Technology Inc. and CM Services, Firestop Contractors International Association (richwalke61@gmail.com)

2024 International Building Code

Revise as follows:

~~714.5.4~~ 714.6 Penetrations in smoke barriers.

Penetrations in *smoke barriers* shall be protected by an *approved through-penetration firestop system* installed and tested in accordance with the requirements of UL 1479 for air leakage. The *L rating* of the system measured at 0.30 inch of water (74.7 Pa) in both the ambient temperature and elevated temperature tests shall not exceed either of the following:

1. 5.0 cfm per square foot (0.025 $m^3/s \times m^2$) of penetration opening for each *through-penetration firestop system*.
2. A total cumulative leakage of 50 cfm (0.024 m^3/s) for any 100 square feet (9.3 m^2) of wall area, or floor area.

Reason: The 2006 through 2012 editions of the International Building Code (IBC) required penetrations in *smoke barriers* which by definition are both vertical or horizontal assemblies to be protected by an *approved through-penetration firestop system* tested in accordance with UL 1479 for air leakage and meeting the requirements contained in the code. The language in this proposal is existing language that was originally located in a standalone section at the end of Section 714, from the 2006 edition through the 2012 edition. In the 2015 edition of the code it was relocated during a reorganization of the numbering for Section 714. It was moved into a subsection under the section 714.5 which relates only to through penetrations in horizontal assemblies. Moving this back toward the end of Section 714 and placing the language in its own section, rather than the subsection related only to penetrations in horizontal assemblies, will allow this requirement to apply to both walls and horizontal assemblies fixing the issue.

Cost Impact: The change proposal is editorial in nature or a clarification and has no cost impact on the cost of construction

Justification for no cost impact:

This section is currently used to determine allowable leakage (L Rating) for walls and floors so it will maintain the current requirements while making a slight editorial change to ensure it is not overlooked and will apply to both vertical barriers and horizontal barriers.

FS53-24

IBC: 715.3

Proponents: Jeffrey Grove, Southern Nevada ICC Chapter (jeff.grove@coffman.com)

2024 International Building Code

Revise as follows:

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 the following locations:

1. Floors within a single *dwelling unit*.
2. Floors where the *joint*s 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*.
11. Between the bottom of a fire-resistance-rated wall and a floor or floor/ceiling assembly, unless the wall abuts two or more interconnected levels.

Reason: Based on the following, fire-resistive joint systems are not required or necessary where a fire-resistance-rated wall is supported by (sits on) a floor or floor/ceiling assembly.

Although the charging section can be interpreted to apply, the assemblies in question do not meet the definition of a joint in Chapter 2 of the 2024 IBC.

JOINT. The opening in or between adjacent assemblies that is created due to building tolerances, or is designed to allow independent movement of the building in any plane caused by thermal, seismic, wind or any other loading.

Where a wall is supported by a floor or floor/ceiling assembly, the bottom of a wall is not designed to allow independent movement. Although “building tolerances” is not defined in the IBC, these assemblies also have little if any tolerances due to the methods of construction. As such, the bottom of a fire-resistance-rated wall does not constitute a joint within the intent of Section 715 and additional protection is not required.

Furthermore, the Gypsum Association manual (GA-216) specifies that “Gypsum panel products applied to walls shall be applied with the bottom edge spaced a minimum of 1/4 in. (6 mm) above the floor.” Drywall is attached to studs, which are connected to a base plate and, as such, there will rarely if ever be a gap at the bottom of a wall sufficient to allow migration of fire, smoke or superheated gasses.

In addition, NFPA® 80, the Standard for Fire Doors and Other Opening Protectives specifies that “Clearance under the bottom of a door shall be a maximum of 3⁄4 in. (19 mm).” This is an indication that the bottom of a fire-resistance-rated wall assembly isn’t as critical as the top, or even the sides.

Based on the preceding, it is clear that joint protection in accordance with Section 715.3 is not required for bottom of wall assemblies and

provides little to no additional protection.

THE PHYSICS:

During a fire, the room of origin becomes positively pressurized above the neutral plane and negatively pressurized below the neutral plane. As such, fire, smoke and superheated gasses will rarely if ever migrate from the room of origin into adjacent spaces at the bottom of a wall and protection at the bottom of the wall contradicts the physics of the requirement.

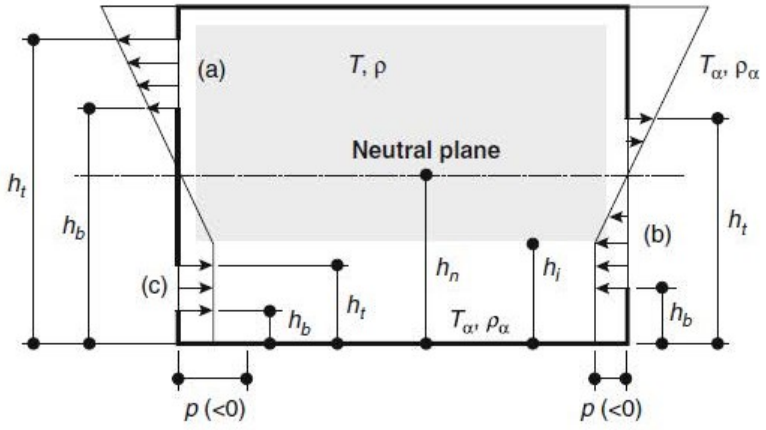


Figure 15.24 from the SFPE Handbook of Fire Protection Engineering – Fifth Edition.

Bibliography: SFPE Handbook of Fire Protection Engineering, Fifth Edition

NFPA® 80, the Standard for Fire Doors and Other Opening Protectives

Cost Impact: Decrease

Estimated Immediate Cost Impact:

Installation of a listed joint system between the bottom of a fire-resistance-rated wall and the floor that supports it ranges from $3 - $4.5 per lineal foot. As such, this clarification of code intent will reduce the cost of construction.

Estimated Immediate Cost Impact Justification (methodology and variables):

Cost information was obtained from mechanical vendors and contractors.

FS53-24

FS54-24

IBC: 715.3

Proponents: William Koffel, Koffel Associates, Inc., Firestop Contractors International Association (FCIA) (wkoffel@koffel.com)

2024 International Building Code

Revise as follows:

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 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*.

Reason: During the 2024 code development cycle, Proposal No. FS64-21 and FS75-21 introduced new Exceptions to Section 714.5.1, Section 715.4 and Section 715.5, which permit unprotected penetrations and unprotected perimeter voids through floors and ramps of both open and enclosed parking garages where the areas above and below the penetrations and voids are parking areas. The proposal on penetrations and voids brought attention to the fact that joints in floors and ramps within open and enclosed parking garages likewise do not require protection. FCIA believes unprotected joints in open and enclosed parking garages and structures does not represent good fire protection practices and as such are proposing the deletion of this exception.

The need to protect joints above or below parking areas is critical in preventing ignition of parked vehicles and ultimately floor-to-floor fire propagation. Joints within floor assemblies of parking garages and ramps extend long distances throughout an entire parking structure. These joints could potentially be located directly above or below parked vehicles, which can further complicate fire-fighting operations.

The construction of modern vehicles has changed to include more plastics and other combustibles. While this benefits the vehicle weight and fuel economy, and lowers the vehicle price, it increases the fuel load and fire growth we see in parking garages.

Modern vehicles present new hazards due to the incorporation of larger quantities of combustible materials (e.g. fuels, plastics, synthetic materials, etc.) into their designs. Another recent vehicle construction change is the use of plastic fuel tanks. Plastic fuel tanks can result in an earlier release of fuel in a fire. Fire tests at Southwest Research Institute showed fuel leakage as a result of fire exposure occurs after less than five minutes of fire exposure. Fuel spill fires represent a likely means of vehicle-to-vehicle fire spread.[1]

As alternative fuel vehicles are popularized, concerns regarding their unique hazards, burn characteristics, and typical burn duration have been raised. Fuels such as propane, natural gas and hydrogen all create different hazards.

New electric vehicle battery and charging equipment technologies are also leading to much more rapid-fire growth than previously contemplated in parking garage design. Fire accidents caused by the thermal runaway of lithium-ion battery have demonstrated that

additional fire safety precautions are needed. It is particularly important to prevent these open and enclosed parking garage fires from occurring due to the challenges the fire services face in fighting parking garage fires.

Compared to older vehicles, modern vehicles burn differently. At the same time, modern parking garages have optimized space requirements for vehicle parking and storage. It is clear that the design assumption of only one or two fire burning has to be revisited. Cars are larger and have more fuel load than before, and the parking spaces have become smaller. This enhances the probability of fire spread between vehicles.

There have been a number of recent cases and studies around the world that are demonstrating that fire safety in parking garages should be enhanced, not further reduced as done with these exceptions. In recent years, Europe has seen a series of large fires (Liverpool, UK (2017); Cork, Ireland (2018); Stavanger Airport in Sola, Norway (2020)[1]; Warsaw, Poland (2020)) that brought fires in parking garages into the focus of public discussions. In October, 2023, a major multi-storey parking garage fires occurred at the Luton Airport, London resulting in structural collapse.

A 2020 study on fires of electric vehicles concluded that in just 22 seconds, cell thermal runaway spreads flames throughout the battery compartment. A full-scale fire test was carried out on a battery system of seventeen 3P6S battery modules mounted with control systems in a car chassis. One battery module was overcharged until thermal runaway occurred. Within five seconds, thermal runaway spread to the four adjacent modules. Released gas was immediately ignited, with jet flame and smoke, and temperatures reached over 600 °C. These five modules then smoldered, and further modules ignited after around two minutes. The authors note that water fire suppression would be hindered by the battery pack casings.[2]

An NFPA Journal article published in 2019 indicated a typical garage fire today is much more likely to involve multiple vehicles than two decades ago, hinting that fires are in fact burning with more severity. In garage fires between 1995 and 1997, only 1 percent of fires involved more than five vehicles. By contrast, between 2010 and 2014, 8 percent of the garage fires involved more than five vehicles.[3]The photo below shows an example of a non-rated construction joint system in the concrete floor of a multi-story parking garage located at the Miracle Mile Shops in Las Vegas, NV. This joint system consists of a steel or aluminum cover plate on the top of the floor, with nothing underneath. This car was one of many parked directly over the top of this and other similar joint systems. In the event of a fire beneath, the underside of the cars, including the fuel tank or battery pack, would see significant radiant heat from the steel cover plate transmitting upward or the aluminum plate simply disappearing and fire propagating. By the 2024 IBC, this non-rated construction joint is permitted. Is the level of protection we should be permitting?

It is now time to recognize the hazards of parking structures and delete the various exceptions which are eliminating the need to protect penetrations, joints and voids in open and enclosed parking garages. This proposal on joints parallels similar proposals covering penetrations and voids which will be heard separately.

Bibliography: 1 NFPA Research Foundation - Modern Vehicle Hazards in Parking Structures and Vehicle Carriers by Haavard Boehmer, PE, Michael Klassen, PhD, PE, Stephen Olenick, PE

2 Li, Huang, Peng, Wen, Yang, Xulai, Chen, Haodong, Sun, Jinhua, Wang, Qingsong, Full-Scale Experimental Study on the Combustion Behavior of Lithium Ion Battery Pack Used for Electric Vehicle Fire Technology, Volume 56- 6, November 01, 2020, https://doi.org/10.1007/s10694-020-00988-w

3 NFPA Journal - Protecting Parking Garages, Mar Apr 2019, Ramp Risk, By Jesse Roman.

Cost Impact: Increase

Estimated Immediate Cost Impact:

$35 - $50 per lineal foot of joints to be protected.

Estimated Immediate Cost Impact Justification (methodology and variables):

Based on industry and manufacturer input, the average cost of an installed joint systems for concrete floors is $35 to $50 per linear ft. The estimate includes materials and labor costs for any type of fire-resistant joint system through a concrete floor assembly. The cost range includes the backing material and sealant components, but excludes the cost of any metallic cover plate which would be required whether the joint was fire-rated or not. The total cost in any given parking garage will depend upon the number and size of joint systems to be installed.

FS54-24

FS55-24

IBC: 715.3, 715.4

Proponents: William Koffel, Koffel Associates, Inc., Firestop Contractors International Association (FCIA) (wkoffel@koffel.com)

2024 International Building Code

Revise as follows:

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 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*.~~

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, roof, or roof/ceiling assemblies shall be protected with an *approved perimeter fire containment system* 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.

Exceptions: An approved perimeter fire containment system shall not be required for voids in the following locations:

1. Floors within a single *dwelling unit*.
2. Floors and ramps within parking garages or *structures* constructed in accordance with Sections 406.5 and 406.6.
3. *Mezzanine* floors.

Reason: Exception 10 is inappropriately located in Section 715. Section 715.3 addresses fire-resistant joint systems, whereas Exception 10 addresses perimeter fire containment systems and should be deleted.

Protecting the breach made at the roof level brings needed firefighter protection while handling firefighting operations from the rooftop.

Cost Impact: Increase

Estimated Immediate Cost Impact:

$35 - $50 per lineal foot of perimeter containment system to be protected.

Estimated Immediate Cost Impact Justification (methodology and variables):

Based on industry and manufacturer input, the average cost of an installed perimeter containment system is $35 - $50/ linear ft.

This includes materials and labor costs for application. The cost estimate is conservative in that if a perimeter containment system is not required, there is still some protection of the intersection that would be required at the roof or roof/ceiling level.

FS55-24

FS56-24

IBC: 715.4, 715.5

Proponents: Tony Crimi, A.C. Consulting Solutions Inc., North American Insulation Manufacturers Association (tcrimi@sympatico.ca)

2024 International Building Code

Revise as follows:

715.4 Exterior curtain wall/fire-resistance-rated floor intersections.
Voids created at the intersection of exterior curtain wall assemblies and fire-resistance-rated floor or floor/ceiling assemblies shall be protected with an *approved perimeter fire containment system* 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.

Exceptions: An approved perimeter fire containment system shall not be required for voids in the following locations:

1. Floors within a single *dwelling unit*.
2. ~~Floors and ramps within parking garages or *structures* constructed in accordance with Sections 406.5 and 406.6.~~
3. ~~3~~2. *Mezzanine* floors.

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.

Exceptions: An *approved* material or system to retard the interior spread of fire and hot gases shall not be required for voids in the following locations:

1. Floors within a single *dwelling unit*.
2. ~~Floors and ramps within parking garages or *structures* constructed in accordance with Sections 406.5 and 406.6.~~
3. ~~3~~2. *Mezzanine* floors.

Reason: During the 2024 code cycle, Proposal No. FS75-21 introduced several exceptions to the requirements to protect perimeter voids in open and closed parking garages for both rated and non-rated floor construction. With this change, perimeter openings are not required to be filled with any material, leaving them entirely open though all floors of the parking garage, in a direct vertical path for flames and hot gases to travel. Voids at curtain walls extend long distances throughout an entire parking structure. The openings will often be located directly above or below parked vehicles, which can further complicate fire fighting operations with multiple floors engaged in fire.

Modern vehicles present new hazards due to the incorporation of larger quantities of combustible materials (e.g. fuels, plastics, synthetic materials, etc.) into their designs. Another recent vehicle construction change is the use of plastic fuel tanks. According to the American Chemistry Council, modern vehicles are now composed of about 50 percent plastic by volume, even though plastics account for only 10 percent of the average vehicle's weight. Industry experts believe that as better technologies and additional fuel-efficiency mandates kick in, the percentage of plastics in cars will only increase.[1] As alternative fuel vehicles are popularized, concerns regarding their unique hazards, burn characteristics, and typical burn duration have been raised. Compared to older vehicles, modern vehicles burn differently. At the same time, modern parking garages have optimized space requirements for vehicle parking and storage. It is clear that the design assumption of only one or two fire burning has to be revisited. Cars are larger and have more fuel load than before, and the parking spaces have become smaller. This enhances the probability of fire spread between vehicles.

New electric vehicle battery and charging equipment technologies are also leading to much more rapid fire growth than previously contemplated in parking garage design. Fire accidents caused by the thermal runaway of lithium-ion battery have demonstrated that additional fire safety precautions are needed. It is particularly important to prevent these open and closed parking garage fires from occurring due to the challenges the fire services face in fighting parking garage fires.

An NFPA Journal article published in 2019 indicated a typical garage fire today is much more likely to involve multiple vehicles than two decades ago, hinting that fires are in fact burning with more severity. In garage fires between 1995 and 1997, only 1 percent of fires

involved more than five vehicles. By contrast, between 2010 and 2014, 8 percent of the garage fires involved more than five vehicles.[2] In the United States, Corporate Average Fuel Efficiency standards mandate that passenger vehicle fleets average 54.5 miles per gallon by 2025. To meet those requirements, it is expected that the average car will incorporate nearly 350 kilograms of plastics, up from 200 kilograms in 2014, according to an analysis by IHS Chemical, a chemical industry research group.[1]

Bibliography: [1] NFPA Journal - Protecting Parking Garages, Mar Apr 2019, Ramp Risk, By Jesse Roman.

[2]NFPA Research Foundation - Modern Vehicle Hazards in Parking Structures and Vehicle Carriers by Haavard Boehmer, PE, Michael Klassen, PhD, PE, Stephen Olenick, PE

Cost Impact: Increase

Estimated Immediate Cost Impact:

Based on the 2024 IBC, the proposal will increase the cost of construction. However, the proposal would bring the cost of construction back to the level of the 2021 and prior IBC editions. Because the 2024 edition is not yet widely adopted, the cost impact is limited at this time.

Estimated Immediate Cost Impact Justification (methodology and variables):

The proposal would bring the cost of construction back to the level of the 2021 and prior IBC editions. The approximate installed cost is $7-10 per lineal foot.

FS56-24

FS57-24

IBC: 715.4.1

Proponents: Tony Crimi, A.C. Consulting Solutions Inc., International Firestop Council (tcrimi@sympatico.ca)

2024 International Building Code

Revise as follows:

715.4.1 Fire test criteria.

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

Exception: Voids created at the intersection of the exterior curtain wall assemblies and floor assemblies where the vision glass extends to the finished floor level shall be permitted to be protected with an *approved* ~~material~~ system to prevent the interior spread of fire. Such systems~~material~~ shall be securely installed and capable of preventing the passage of flame and hot gases sufficient to ignite cotton waste through the void where subjected to ASTM E119 time-temperature fire conditions under a minimum positive pressure differential of 0.01 inch of water (2.49 Pa) for the time period not less than the *fire-resistance rating* of the floor assembly.

Reason: This proposal provides additional clarification to the requirements for the exceptions to ASTM E2307 tested perimeter fire containment systems (PFC).

The exception in 715.4.1 applies to protection of the perimeter void. As currently written, the exception permits a “material” that has been test to an ASTM E119 fire exposure but is not at all clear as to how that needs to be done for the results to be meaningful. For example, an insulation material tested to ASTM E119 within the cavity of an interior wall assembly provides no assurance that material would provide the intended protection for a void installed horizontally between a floor assembly and a curtain wall.

This proposal clarifies that what is required is a system that that resembles the orientation, dimensions and fastening that needed to prevent the passage of flames and hot gases through the void. This aligns with the performance objectives of the base requirements in 715.4.1. Information such as joint width, adhesion to substrates, fastening, etc. need to be representative of what is being installed.

Cost Impact: The change proposal is editorial in nature or a clarification and has no cost impact on the cost of construction

Justification for no cost impact:

The proposal clarifies the intent of the provision and the exception. The wording is consistent with the intent of the base requirement.

FS58-24

IBC: 715.7, 715.7.1 (New)

Proponents: Brendan Smith, CannonDesign, CannonDesign (bsmith@cannondesign.com)

2024 International Building Code

715.7 Exterior wall/vertical fire barrier intersections.
Voids created at the intersection of nonfire-resistance-rated exterior 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.

Add new text as follows:

715.7.1 Materials and systems.. Acceptable materials and systems shall be Fireblocking materials as specified in Section 718.2.1, or other approved materials.

Reason: No specific materials or systems are currently listed in the code as meeting the intent of this section. To comply with the code as currently written, every project with a rated interior wall terminating at a non-rated exterior wall would be required to apply to the building official for approval of its particular proposed materials and systems. These details are often difficult to sequence and construct, and require careful detailing and coordination with adjacent materials and systems. Building officials having inconsistent standards makes it difficult to confidently develop standard details that are well vetted for constructability, and may lead to significant revisions in the field.

Fireblocking materials are already well defined in the code and are intended to serve essentially the same purpose. The Commentary to 2021 IBC 718 states that "...Fireblocking involves the use of building materials to prevent the movement of flame and gases to other areas..." It would make sense to allow these materials, already approved to prevent the arguably greater risk of vertical movement of fire and gases, to be used for a similar function preventing horizontal movement.

This would allow architects and contractors to work together to develop more effective and constructable details through continued use of consistent approaches, and would provide building officials with greater confidence in the design, installation quality, and appropriateness of such details.

Cost Impact: The change proposal is editorial in nature or a clarification and has no cost impact on the cost of construction

Justification for no cost impact:

The proposed change would merely codify some optional solutions as acceptable where none are currently explicitly provided. These are likely solutions that are already being used to comply with the current language, and other approved approaches are still allowed. Though there may be savings compared to projects that might be using more expensive alternative methods currently, it would not be possible to make an accurate estimate of the extents or nature of such solutions. We do not believe that the proposed acceptable solutions differ significantly in cost from what we have seen in our experience to date.

FS59-24

IBC: TABLE 716.1(2)

Proponents: Robert Marshall, FCAC, FCAC (fcac@iccsafe.org)

2024 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[a]	FIRE-RATED GLAZING MARKING DOOR VISION PANEL[b, c]	MINIMUM SIDELIGHT/TRANSOM ASSEMBLY RATING (hours)		FIRE-RATED GLAZING MARKING SIDE-LIGHT/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 a	D-H-W-240	Not Permitted	4	Not Permitted	W-240
	3		3[d]	See Note a	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
Double fire walls constructed in accordance with NFPA 221	Single-wall assembly rating (hours)[e]	Each wall of the double-wall assembly (hours)[f]	—						
	4	3	3	See Note a	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.[b]	≤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[g]	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[d]	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-45	3/4[h]		D-H-45[h]	
Fire partitions: Corridor walls	1		1/3[a]	Maximum size tested	D-20	3/4[a]		D-H-OH-45	
	0.5		1/3[a]	Maximum size tested	D-20	1/3		D-H-OH-20	
Other fire partitions	1		3/4[i]	Maximum size tested	D-H-45	3/4		D-H-45	
	0.5		1/3	Maximum size tested	D-H-20	1/3		D-H-20	
Exterior walls	3		1 1/2	100 sq. in.[a]	≤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[h]	2	D-H-OH-90[h]	W-120
						Fire protection			
	1		3/4	Maximum size tested	D-H-45	3/4[h]		D-H-45[h]	
Smoke barriers						Fire protection			

TYPE OF ASSEMBLY	REQUIRED WALL ASSEMBLY RATING (hours)	MINIMUM FIRE DOOR AND FIRE SHUTTER ASSEMBLY RATING (hours)	DOOR VISION PANEL SIZE	FIRE-RATED GLAZING MARKING DOOR VISION PANEL	MINIMUM SIDELIGHT/TRANSOM ASSEMBLY RATING (hours)		FIRE-RATED GLAZING MARKING SIDE-LIGHT/TRANSOM PANEL	
					Fire protection	Fire resistance	Fire protection	Fire resistance
	1	1/3	Maximum size tested	D-20	3/4		D-H-OH-45	

For SI: 1 square inch = 645.2 mm.

a. Fire-resistance-rated glazing tested to ASTM E119 or UL 263 in accordance with Section 716.1.2.3 shall be permitted, in the maximum size tested.

b. Under the column heading “Fire-rated glazing marking door vision panel,” W refers to the fire-resistance rating of the glazing, not the frame.

c. See Section 716.1.2.2.1 and Table 716.1(1) for additional permitted markings.

d. 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.

e. As required in Section 706.4.

f. As allowed in Section 4.6 of NFPA 221.

g. See Section 716.2.5.1.2.

h. Fire-protection-rated glazing is not permitted for fire barriers required by Section 1207 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.

i. Two doors, each with a fire rating of 20 minutes, installed on opposite sides of the same opening in a fire partition, shall be deemed equivalent in fire protection rating to one 45-minute fire door.

Reason: This proposal is intended to add UL 263 into Footnote a which currently only includes ASTM E119.

Over the last five of so ICC code development cycle, it has been the practice to include both ASTM E119 and UL 263 in all references to testing for a fire-resistance rating. This is based on the fact that these two fire test standards describe the same test equipment, same test procedure and same conditions of acceptance. Adding UL 263 to Footnote a brings consistency with Footnote h of Table 716.1(2) along with approximately forty other references within the IBC.

FCAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2023 and early 2024 the FCAC has held several virtual meetings and one in-person meeting open to any interested party. In addition, there were numerous virtual Working Group meetings for the current code development cycle, which included members of the committee as well as interested parties. Related documents and reports are posted on the **FCAC Website**

Cost Impact: The change proposal is editorial in nature or a clarification and has no cost impact on the cost of construction

Justification for no cost impact:

The proposed change simply adds an alternate test standard describing the test procedure for establishing a fire-resistance rating.

FS59-24

FS60-24

IBC: TABLE 716.1(2)

Proponents: Richard Walke, Creative Technology Inc., SAFTIFIRST (richwalke61@gmail.com)

2024 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[a]	FIRE-RATED GLAZING MARKING DOOR VISION PANEL[b, c]	MINIMUM SIDELIGHT/TRANSOM ASSEMBLY RATING (hours)		FIRE-RATED GLAZING MARKING SIDE-LIGHT/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 a~~ Maximum size tested a	D-H-W-240	Not Permitted	4	Not Permitted	W-240
	3		3[d]	~~See Note a~~ Maximum size tested a	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
				Maximum size tested a	D-H-W-90				
	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
				Maximum size tested a	D-H-W-90				
Double fire walls constructed in accordance with NFPA 221	Single-wall assembly rating (hours)[e]	Each wall of the double-wall assembly (hours)[f]	—						
	4	3	3	~~See Note a~~ Maximum size tested a	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
				Maximum size tested a	D-H-W-90				
	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
				Maximum size tested a	D-H-W-60				
Enclosures for shafts, interior exit stairways and interior exit ramps.	2		1 1/2	≤ 100 sq. in.[b]	~~≤100 sq. in. – D-H-90 > 100 sq. in. – D-H-T-W-90~~	Not Permitted	2	Not Permitted	W-120
				Maximum size tested a	D-H-T-W-90				
Horizontal exits in fire walls[g]	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

TYPE OF ASSEMBLY	REQUIRED WALL ASSEMBLY RATING (hours)	MINIMUM FIRE DOOR AND FIRE SHUTTER ASSEMBLY RATING (hours)	DOOR VISION PANEL SIZE	FIRE-RATED GLAZING MARKING DOOR VISION PANEL	MINIMUM SIDELIGHT/TRANSOM ASSEMBLY RATING (hours)		FIRE-RATED GLAZING MARKING SIDE-LIGHT/TRANSOM PANEL	
					Fire protection	Fire resistance	Fire protection	Fire resistance
			Maximum size tested a	D-H-W-240				
	3	3[d]	≤ 100 sq. in.	~~≤100 sq. in. –~~ D-H-180 ~~> 100 sq. in. – D-H-W-180~~	Not Permitted	3	Not Permitted	W-180
			Maximum size tested a	D-H-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
			Maximum size tested a	D-H-T-W-60				
					Fire protection			
Other fire barriers	1	3/4	Maximum size tested i	D-H-45	3/4[h]		D-H-45[h]	
Fire partitions: Corridor walls	1	1/3[a]	Maximum size tested i	D-20	3/4[a]		D-H-OH-45	
	0.5	1/3[a]	Maximum size tested i	D-20	1/3		D-H-OH-20	
Other fire partitions	1	3/4[i]	Maximum size tested i	D-H-45	3/4		D-H-45	
	0.5	1/3	Maximum size tested i	D-H-20	1/3		D-H-20	
Exterior walls	3	1 1/2	≤ 100 sq. in.[a]	~~≤100 sq. in. –~~ D-H-90 ~~> 100 sq. in. – D-H-W-90~~	Not Permitted	3	Not Permitted	W-180
			Maximum size tested a	D-H-W-90				
	2	1 1/2	Maximum size tested i	D-H 90 ~~or D-H-W-90~~	1 1/2[h]	2	D-H-OH-90[h]	W-120
			Maximum size tested a	D-H-W-90				
					Fire protection			
	1	3/4	Maximum size tested i	D-H-45	3/4[h]		D-H-45[h]	
Smoke barriers					**Fire protection**			
	1	1/3	Maximum size tested i	D-20	3/4		D-H-OH-45	

For SI: 1 square inch = 645.2 mm.

a. Fire-resistance-rated glazing tested to ASTM E119 in accordance with Section 716.1.2.3, and as part of the door assembly to NFPA 252, UL 10B or UL 10C shall be permitted, in the maximum size tested.

b. Under the column heading “Fire-rated glazing marking door vision panel,” W refers to the fire-resistance rating of the glazing, not the frame.

c. See Section 716.1.2.2.1 and Table 716.1(1) for additional permitted markings.

d. 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.

e. As required in Section 706.4.

f. As allowed in Section 4.6 of NFPA 221.

g. See Section 716.2.5.1.2.

h. Fire-protection-rated glazing is not permitted for fire barriers required by Section 1207 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.

i. Two doors, each with a fire rating of 20 minutes, installed on opposite sides of the same opening in a fire partition, shall be deemed equivalent in fire protection rating to one 45-minute fire door.

j. Fire-protection-rated glazing tested as part of the door assembly to NFPA 252, UL 10B or UL 10C shall be permitted, in the maximum size tested.

Reason: This proposal is intended to clarify the rather confusing format of Table 716.1(2) which limits the size of the glazing in **Door Vision Panel Size** column to 100 sq. in. only to allow larger sizes in the next column if fire-resistance-rated glazing is used. This new format creates two distinct line items for the **Door Vision Panel Size** column; one for fire-protection-rated glazing and one for fire-resistance-rated glazing. Within each line item, the first column now specifies the allowable size and the second column the required glazing marking.

In addition to the above clarifications, other clean-up items have been included as follows:

1. Footnote a, now appearing in the heading information of the **Door Vision Panel Size** column, is being relocated from the heading to the individual table entries to which it applies.
2. An extraneous reference to Footnote b is being deleted from an individual table entry under the **Door Vision Panel Size** column and **Enclosures for shafts, interior exit stairways and interior exit ramps** row. This same footnote appears in the headings relating to the **Fire-Rated Glazing Marking Door Vision Panel** column making it unnecessary in the individual table entries.
3. The less than or equal symbol is being added in front of the 100 sq in. notations in the cells within the **Door Vision Panel Size** column to clarify that the 100 sq in. is the maximum allowable size of glazing corresponding to the marking in the following column.
4. The legend for Footnote a is being expanded to fully describe the test requirements for fire-resistance-rated glazing used in door applications. The requirements include testing the glazing in a wall assembly in accordance with ASTM E119 or UL 263, and testing it as part of a door assembly in accordance with NFPA 252, UL 10B or UL 10C.
5. A new Footnote J is being added to emphasize the test requirements for fire-protection-rated glazing. This footnote applies to individual table entries within the **Door Vision Panel Size** column where fire-protection-rated glazing is permitted in the maximum size tested.

It is believed this new format will reduce the confusion on the allowable glazing size and the testing requirements, and help ensure the proper glazing is used based on the application.

Cost Impact: The change proposal is editorial in nature or a clarification and has no cost impact on the cost of construction

Justification for no cost impact:

The proposed changes simply clarify the existing requirements.

FS60-24

FS61-24

IBC: TABLE 716.1(2)

Proponents: Richard Walke, Creative Technology Inc., SAFTIFIRST (richwalke61@gmail.com)

2024 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[a]	FIRE-RATED GLAZING MARKING DOOR VISION PANEL[b, c]	MINIMUM SIDELIGHT/TRANSOM ASSEMBLY RATING (hours)		FIRE-RATED GLAZING MARKING SIDE-LIGHT/TRANSOM PANEL	
						Fire protection	Fire resistance	Fire protection	Fire resistance[i]
Fire walls and fire barriers having a required fire-resistance rating greater than 1 hour	4		3	See Note a	D-H-W-240	Not Permitted	4	Not Permitted	W-240
	3		3[d]	See Note a	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
Double fire walls constructed in accordance with NFPA 221	Single-wall assembly rating (hours)[e]	Each wall of the double-wall assembly (hours)[f]	—						
	4	3	3	See Note a	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.[b]	≤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[g]	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[d]	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-45	3/4[h]		D-H-45[h]	
Fire partitions: Corridor walls	1		1/3[a]	Maximum size tested	D-20	3/4[a]		D-H-OH-45	
	0.5		1/3[a]	Maximum size tested	D-20	1/3		D-H-OH-20	
Other fire partitions	1		3/4[f]	Maximum size tested	D-H-45	3/4		D-H-45	
	0.5		1/3	Maximum size tested	D-H-20	1/3		D-H-20	
Exterior walls	3		1 1/2	100 sq. in.[a]	≤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[h]	2	D-H-OH-90[h]	W-120
						Fire protection			
	1		3/4	Maximum size tested	D-H-45	3/4[h]		D-H-45[h]	
Smoke barriers						**Fire protection**			

TYPE OF ASSEMBLY	REQUIRED WALL ASSEMBLY RATING (hours)	MINIMUM FIRE DOOR AND FIRE SHUTTER ASSEMBLY RATING (hours)	DOOR VISION PANEL SIZE	FIRE-RATED GLAZING MARKING DOOR VISION PANEL	MINIMUM SIDELIGHT/TRANSOM ASSEMBLY RATING (hours)		FIRE-RATED GLAZING MARKING SIDE-LIGHT/TRANSOM PANEL	
					Fire protection	Fire resistance	Fire protection	Fire resistance
	1	1/3	Maximum size tested	D-20	3/4		D-H-OH-45	

For SI: 1 square inch = 645.2 mm.

a. Fire-resistance-rated glazing tested to ASTM E119 in accordance with Section 716.1.2.3 shall be permitted, in the maximum size tested.

b. Under the column heading “Fire-rated glazing marking door vision panel,” W refers to the fire-resistance rating of the glazing, not the frame.

c. See Section 716.1.2.2.1 and Table 716.1(1) for additional permitted markings.

d. 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.

e. As required in Section 706.4.

f. As allowed in Section 4.6 of NFPA 221.

g. See Section 716.2.5.1.2.

h. Fire-protection-rated glazing is not permitted for fire barriers required by Section 1207 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.

i. Two doors, each with a fire rating of 20 minutes, installed on opposite sides of the same opening in a fire partition, shall be deemed equivalent in fire protection rating to one 45-minute fire door.

j. See Section 716.2.5.4 for requirements for fire-resistance-rated glazing installed in sidelight/transom panels.

Reason: This proposal is intended to clarify the type of glazing and frame required in sidelights and transoms in applications where fire-protection-rated glazing is not permitted. Where this issue gets confusing is that for Door Vision Panels which exceed the allowable size for fire-protection-rated glazing, fire-resistance-rated glazing may be used within the typical glass light kit. These glass light kits are considered to be fire-protection-rated in that like the door in which they are installed, they will not meet the heat transmission requirements of ASTM E119 and UL 263. However, when fire-protection-rated glazing is not permitted in sidelights and transoms, a fire-resistance-rated glazing and frame assembly having a fire-resistance rating based on testing the combination of the glazing and frame assembly in accordance with ASTM E119 or UL 263 must be used. The new Footnote j clarifies this point by referencing the code user to Section 716.2.5.4 where the required glazing and frame are clarified. There are multiple fire resistance designs published by the various Nationally Recognized Testing Laboratories which can be used to show compliance with this requirement.

It is believed this new footnote will reduce the confusion on the type of glazing and frame required and help ensure the proper glazing and frame is used in this application.

Cost Impact: The change proposal is editorial in nature or a clarification and has no cost impact on the cost of construction

Justification for no cost impact:

The proposed changes simply clarity the existing requirements.

FS61-24

FS62-24

IBC: TABLE 716.1(2), 716.2.5.4

Proponents: Richard Walke, Creative Technology Inc., SAFTIFIRST (richwalke61@gmail.com)

2024 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[a]	FIRE-RATED GLAZING MARKING DOOR VISION PANEL[b, c]	MINIMUM SIDELIGHT/TRANSOM ASSEMBLY RATING (hours)		FIRE-RATED GLAZING MARKING SIDE-LIGHT/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 a	D-H-W-240	Not Permitted	4	Not Permitted	W-240
	3		3[d]	See Note a	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
Double fire walls constructed in accordance with NFPA 221	Single-wall assembly rating (hours)[e]	Each wall of the double-wall assembly (hours)[f]	—						
	4	3	3	See Note a	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.[b]	≤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[g]	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[d]	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-45	3/4[h]		D-H-45[h]	
Fire partitions: Corridor walls	1		1/3[a]	Maximum size tested	D-20	3/4[a]		D-H-OH-45	
	0.5		1/3[a]	Maximum size tested	D-20	1/3		D-H-OH-20	
Other fire partitions	1		3/4[i]	Maximum size tested	D-H-45	3/4		D-H-45	
	0.5		1/3	Maximum size tested	D-H-20	1/3		D-H-20	
Exterior walls	3		1 1/2	100 sq. in.[a]	≤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~~ 100 sq. in.[a]	≤ 100 sq. in. = D-H 90 ~~or~~ > 100 sq. in = D-H-W-90	1 1/2[h] Not Permitted	2	~~D-H-OH-90~~[h] Not Permitted	W-120
						Fire protection			

TYPE OF ASSEMBLY	REQUIRED WALL ASSEMBLY RATING (hours)	MINIMUM FIRE DOOR AND FIRE SHUTTER ASSEMBLY RATING (hours)	DOOR VISION PANEL SIZE	FIRE-RATED GLAZING MARKING DOOR VISION PANEL	MINIMUM SIDELIGHT/TRANSOM ASSEMBLY RATING (hours)		FIRE-RATED GLAZING MARKING SIDE-LIGHT/TRANSOM PANEL	
					Fire protection	Fire resistance	Fire protection	Fire resistance
	1	3/4	Maximum size tested	D-H-45	3/4[h]		D-H-45[h]	
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. Fire-resistance-rated glazing tested to ASTM E119 in accordance with Section 716.1.2.3 shall be permitted, in the maximum size tested.

b. Under the column heading “Fire-rated glazing marking door vision panel,” W refers to the fire-resistance rating of the glazing, not the frame.

c. See Section 716.1.2.2.1 and Table 716.1(1) for additional permitted markings.

d. 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.

e. As required in Section 706.4.

f. As allowed in Section 4.6 of NFPA 221.

g. See Section 716.2.5.1.2.

h. Fire-protection-rated glazing is not permitted for fire barriers required by Section 1207 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.

i. Two doors, each with a fire rating of 20 minutes, installed on opposite sides of the same opening in a fire partition, shall be deemed equivalent in fire protection rating to one 45-minute fire door.

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).

Reason: This proposal is intended to increase the required level of fire performance for glazing within fire door assemblies and within sidelights and transom panels in 2 hr exterior walls applications. In doing so, it also brings consistency within Table 716.1(2) for all applications requiring a fire door / fire shutter rating in excess of 3/4 hr.

The revisions to Table 716.1(2) and Section 716.2.5.4 are specifically intended to limit the allowable area of fire-protection-rated glazing in 1-1/2 hr fire-protection-rated fire door assemblies in exterior walls to a maximum of 100 sq. in. If more than 100 sq. in. of glazing is needed, then fire-resistance-rated glazing is required. In addition, this proposal is intended to require sidelights and transoms adjacent to these doors to be glazed with fire-resistance-rated glazing in recognition of the relatively large sections of glazing typical installed in the sidelights and transoms.

Both fire-protection-rated glazing and fire-resistance-rated glazing are intended to stop the spread of flame and smoke. However, fire-resistance-rated glazing also complies with an unexposed surface temperature limitation on the glazing. The test standards utilized to determine the fire-resistance rating, ASTM E119 / UL 263, limit the temperature rise on the unexposed side to 250°F average / 325°F individual point for the entire duration of the fire exposure. The standards utilized to determine the fire-protection rating on the fire door assembly, NFPA 252 / UL 10B / UL 10C, and on the sidelights and transom panels, NFPA 257 / UL 9, do not have a temperature

limitation. As a result, the glazing gets hot!

Many studies have been conducted over years to quantity the level of radiant heat from fire-protection-rated glazing. The radiant heat from the glazing is significant enough to cause a fire on the other side of the fire-resistance-rated barrier. Three individual Test Reports /Data Packages analyzing the heat transfer and radiant heat from the glazing are described below:

1. The June 9, 2006 **Fire Tests of Building Construction and Materials w/ Radiation Reaction of Mannequins** evaluated three variations of ceramic fire-protection-rated glazing, 44 in wide by 77 in. tall in SAFTI*FIRST*'s EZ frame, installed in a masonry wall assembly. Fully clothed mannequins were placed 20 in. for each of the glazing panels. The mannequin's ignited at 9:06, 12:15 and 16:10 for the three glazing variations. This report is available at https://www.dropbox.com/scl/fi/2vuykq3n8ztk7zkr3sk84/Radiant-Heat-Test-Report.pdf?rlkey=lk6ehccg0kgqjdtvmu0ndrrjs&dl=0

2. The March 20, 2006 **O'Keeffe's Inc. – Glass Profile** data package is a more complete data package of the thermal imaging camera data for fire test described in the June 9, 2006 Report. The data shows the temperature on each of the three glazing materials exceeded 1000°F in approximately 10 min. This report is available at https://www.dropbox.com/scl/fi/8u23sxu4f35g5jjrt08vg/Infrared-Inspection-V2.pdf?rlkey=xa847sn3hnnhk7rji24x9siqc&dl=0

3. The May 13, 2016 **Report of Testing Ceramic Glass with Reference SAFTI FIRST EZ Frame for compliance with the applicable requirements of the following criteria: Modified UL 9, Standard for Safety, Fire Tests of Window Assemblies, 2009** evaluated one 43 in. wide by 77 in. tall ceramic glazing panel in SAFTI*FIRST*'s EZ frame, installed in a gypsum board wall assembly. The thermal imaging camera data for this fire test shows an average temperature of approximately 970°F at 10 min. In addition, this report also shows a radiant heat flux of approximately 24 KW/m^2 at a distance of 1.0 meter from the glazing, at 45 min into the fire exposure test. A generally accepted level of heat flux sufficient to ignite wood under a piloted and nonpiloted scenario is 12.5 and 29 kW / m^2. This report is available at https://www.dropbox.com/scl/fi/knhapos5u2w68bwx4s8ha/Final-Test-Report.pdf?rlkey=0zhuwqmn8e7iazg5c73b8oqea&dl=0

Looking at the current Table 716.1(2), all applications requiring a Minimum Fire Door and Fire Shutter Assembly Rating greater than 3/4 hr other than 1-1/2 hr fire-door assemblies in 2 hr exterior walls, limits the area of fire-protection-rated glazing in the door to 100 sq. in. In addition, all applications other than 1-1/2 hr fire door assemblies in exterior walls do not permit the use of fire-protection-rated glazing in side-lights or transoms regardless of size. As such, the change proposed herein brings consistency to the various applications covered in Table 716.1(2).

In addition to the changes required in Table 716.1(2), Section 716.2.5.4 is also being changed to be consistent with the changes in Table 716.1(2).

On the surface this proposal appears to have major consequences. However, the applications where this proposed change would have an impact is very limited. Based on Tables 601 and 705.5, the applications where this change would have an impact are as follows:

1. Exterior Bearing Walls in Types IB, IIIA, IIIB, IVB, IVC and IVHT types of construction
2. Exterior Nonbearing Walls with Fire Separation Distances < 5 ft in all types of construction in F-1, M and S-1 occupancies
3. Exterior Nonbearing Walls with Fire Separation Distances of 5 ≤ X < 10 ft in all IA and IVA types of construction in F-1, M and S-1 occupancies
4. Exterior Nonbearing Walls with Fire Separation Distances of 5 ≤ X < 10 ft in all types of construction other than IA and IVA in H occupancies
5. Exterior Nonbearing Walls with Fire Separation Distances of 10 ≤ X < 30 ft in IA, IB, IVA and IVB types of construction in H occupancies

The applications where this proposal truly has an impact is further reduced through the application of Table 705.8. This table permits a combination of protected and unprotected openings based on fire separation distance and the use of sprinklers.

Bibliography: Radiant Heat Flux https://guides.firedynamicstraining.ca/g/structural-firefighting-fundamentals-of-fire-and-combustion/118132

Cost Impact: Increase

Estimated Immediate Cost Impact:

The average additional installed cost of fire-resistance-rated glazing as compared to fire-protection-rated glazing is approximately $60 to

$85 / sq. ft, depending on the rating. However as stated in the Reason Statement, the applications where this proposed change would have an impact is very limited.

Estimated Immediate Cost Impact Justification (methodology and variables):

This includes average materials and labor costs for the above items. In the end, the exact increase in cost is based on the fire separation distance, the type of construction, the occupancy and the specific building design in question.

FS62-24

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IBC: TABLE 716.1(2), TABLE 716.1(3)

Proponents: Richard Walke, Creative Technology Inc., SAFTIFIRST (richwalke61@gmail.com)

2024 International Building Code

Revise as follows:

TABLE 716.1(2) ~~OPENING~~ FIRE DOOR ASSEMBLY ~~PROTECTION ASSEMBLIES,~~RATINGS AND FIRE-RATED GLAZING MARKINGS [a]

TYPE OF ASSEMBLY	REQUIRED WALL ASSEMBLY RATING (hours)		MINIMUM FIRE DOOR AND FIRE SHUTTER ASSEMBLY RATING (hours)	DOOR VISION PANEL SIZE[~~ab~~]	FIRE-RATED GLAZING MARKING DOOR VISION PANEL ~~b, c, d~~	MINIMUM SIDELIGHT/TRANSOM ASSEMBLY RATING (hours)		FIRE-RATED GLAZING MARKING SIDE-LIGHT/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 ~~a~~ b	D-H-W-240	Not Permitted	4	Not Permitted	W-240
	3		3[~~de~~]	See Note ~~a~~ 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
Double fire walls constructed in accordance with NFPA 221	Single-wall assembly rating (hours)[~~ef~~]	Each wall of the double-wall assembly (hours)[~~fg~~]	—						
	4	3	3	See Note ~~a~~ 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.[~~b~~] 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[~~gh~~]	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[~~de~~]	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-45	3/4[~~hi~~]		D-H-45[~~hi~~]	
Fire partitions: Corridor walls	1		1/3[~~ab~~]	Maximum size tested	D-20	3/4[~~ab~~]		D-H-OH-45	
	0.5		1/3[~~ab~~]	Maximum size tested	D-20	1/3		D-H-OH-20	
Other fire partitions	1		3/4[~~hi~~]	Maximum size tested	D-H-45	3/4		D-H-45	
	0.5		1/3	Maximum size tested	D-H-20	1/3		D-H-20	
Exterior walls	3		1 1/2	100 sq. in.[~~a~~] 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[~~hi~~]	2	D-H-OH-90[~~hi~~]	W-120
						Fire protection			
	1		3/4	Maximum size tested	D-H-45	3/4[~~hi~~]		D-H-45[~~hi~~]	
Smoke barriers						Fire protection			

TYPE OF ASSEMBLY	REQUIRED WALL ASSEMBLY RATING (hours)	MINIMUM FIRE DOOR AND FIRE SHUTTER ASSEMBLY RATING (hours)	DOOR VISION PANEL SIZE	FIRE-RATED GLAZING MARKING DOOR VISION PANEL	MINIMUM SIDELIGHT/TRANSOM ASSEMBLY RATING (hours)		FIRE-RATED GLAZING MARKING SIDE-LIGHT/TRANSOM PANEL	
					Fire protection	Fire resistance	Fire protection	Fire resistance
	1	1/3	Maximum size tested	D-20	3/4		D-H-OH-45	

For SI: 1 square inch = 645.2 mm.

a. Where required, glazing shall also comply with the safety glazing requirements and identification specified in Section 716.1.2.1.

~~a~~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.

~~b~~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.

~~c~~d. See Section 716.1.2.2.1 and Table 716.1(1) for additional permitted markings.

~~d~~e. Two doors, each with a fire protection rating of $1\frac{1}{2}$ 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.

~~e~~f. As required in Section 706.4.

~~f~~g. As allowed in Section 4.6 of NFPA 221.

~~g~~h. See Section 716.2.5.1.2.

~~h~~i. Fire-protection-rated glazing is not permitted for fire barriers required by Section 1207 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.

~~i~~j. Two doors, each with a fire rating of 20 minutes, installed on opposite sides of the same opening in a fire partition, shall be deemed equivalent in fire protection rating to one 45-minute fire door.

TABLE 716.1(3) FIRE WINDOW ASSEMBLY ~~FIRE PROTECTION~~ RATINGS AND FIRE-RATED GLAZING MARKINGS [a]

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~~b]	W-XXX[~~b~~c]
Fire barriers	>1	NP[~~a~~b]	W-XXX[~~b~~c]
	1	NP[~~a~~b]	W-XXX[~~b~~c]
Atrium separations (Section 707.3.6), Incidental use areas (Section 707.3.7),[~~c~~d] Mixed occupancy separations (Section 707.3.9)	1	3/4	OH-45 or W-60
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	$1\frac{1}{2}$	OH-90 or W-XXX[~~b~~c]
	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. Where required, glazing shall also comply with the safety glazing requirements and identification specified in Section 716.1.2.1.

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

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

~~c~~d. Fire-protection-rated glazing is not permitted for fire barriers required by Section 1207 of the *International Fire Code* to enclose energy storage systems. Fire-resistance-rated glazing assemblies tested to ASTM E119 orUL 263, as specified in Section 716.1.2.3, shall be permitted.

Reason: This proposal is intended to ensure code users are aware that glazing in or around door assemblies and in fire window assemblies is in most cases required to meet the safety glazing requirements of Chapter 24. The new footnote a to Tables 716.1(2) and 716.1(3) points the code users to Section 716.1.2.1, which in turn points the code readers to Chapter 24. Within Chapter 24, Section 2406 covers the requirements for safety glazing including the marking requirements.

The identification of all subsequent footnotes has been shifted one character as a result of the new Footnote a.

In addition to the new footnote, the titles of Tables 716.1(2) and 716.1(3) have been changed to more accurately reflect the information conveyed in the tables.

It is believed this new footnote a will help ensure the proper glazing is used in applications requiring safety glazing.

Cost Impact: The change proposal is editorial in nature or a clarification and has no cost impact on the cost of construction

Justification for no cost impact:

The proposed changes simply clarify the existing requirements.

FS63-24

FS64-24

IBC: 716.2.2.3, 716.2.2.3.1, 716..2.2.3.2 (New)

Proponents: John Woestman, Kellen Company, Builders Hardware Manufacturers Association (BHMA) (jwoestman@kellencompany.com)

2024 International Building Code

Revise as follows:

716.2.2.3 Doors in interior exit stairways and ramps and exit passageways.
Fire door assemblies in *interior exit stairways* and *ramps* and *exit passageways* shall have a maximum transmitted temperature rise of not more than 450°F (250°C) above ambient at the end of 30 minutes of standard fire test exposure.

Exception: The maximum transmitted temperature rise is not required in *buildings* equipped throughout with an *automatic sprinkler system* installed in accordance with Section 903.3.1.1 or 903.3.1.2.

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-resistance-rated glazing 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 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.

Add new text as follows:

716..2.2.3.2 Louvers. Louvers are prohibited in fire door assemblies in interior exit stairways and ramps and exit passageways.

Reason: The IBC currently requires many doors to interior exit stairways and ramps and exit passageways to comply with Section 716 Opening protectives. Section 716 requires opening protectives to comply with NFPA 80 Standard for Fire Doors and Opening Protectives. There are louvers listed and labeled to NFPA 80. Thus, louvers are currently permitted in fire door assemblies in interior exit stairways and ramps and exit passageways (except where Section 1023.12 refers to Sections 403.5.4, 405.7.2 or 412.2.2.1).

Our BHMA members are asking: Considering the life safety importance of controlling smoke in interior exit stairways, and ramps, and exit passageways, should louvers be permitted – or prohibited – in fire door assemblies in interior exit stairways and ramps and exit passageways?

Our conclusion, and this proposal: louvers should be prohibited in fire door assemblies in interior exit stairways and ramps and exit passageways.

Cost Impact: The change proposal is editorial in nature or a clarification and has no cost impact on the cost of construction

Justification for no cost impact:

This proposal should not increase or decrease the cost of construction.
This proposal prohibits the use of louvers in fire door assemblies in interior exit stairways and ramps and exit passageways. This may reduce the cost of these doors. On the other hand, if the heating, cooling, and fire safety systems for interior exit stairways and ramps and exit passageways are designed with louvers in fire door assemblies – there are likely better design options, and those options may have an unknown cost effect.

FS65-24

IBC: 716.2.6.1

Proponents: Jeff O'Neil, Chair, Committee on Healthcare (ahc@iccsafe.org)

2024 International Building Code

Revise as follows:

716.2.6.1 Door closing.
Fire doors shall be latching and self- or automatic-closing in accordance with this section.

Exceptions:

1. *Fire doors* located in common walls separating *dwelling units* or *sleeping units* in Group R-1 shall be permitted without automatic- or *self-closing* devices.
2. Fire doors located in corridors and serving sleeping rooms in Group I-1, Condition 2 shall be permitted without automatic- or self-closing devices.
3. ~~2~~. The elevator car doors and the associated elevator hoistway doors at the floor level designated for recall in accordance with Section 3003.2 shall be permitted to remain open during Phase I emergency recall operation.
4. ~~3~~. Fire doors required solely for compliance with ICC 500 shall not be required to be *self-closing* or automatic-closing.

Reason: Nursing homes (Group I-2, Condition 2) are not required to have self-closing or automatic-closing corridor doors. This is due to the facilities having smoke compartments to subdivide care recipient sleeping areas, the building being fully sprinklered, and staff trained in fire and safety evacuation plans. Assisted living (Group I-1, Condition 2) are also required to have smoke compartments, the building to be fully sprinklered and the staff trained in fire and safety evacuation plans. In Assisted living (Group I-1, Condition 2), residents, while slower, are required to be capable of self preservation. In these facilities, it is beneficial to allow for door to be open to improved supervision and to increase social interaction - both of which shown to improve the environment and comfort of care recipients.

Care recipients in Assisted Living (I-1, Condition 2) facilities quite often use mobility devices and/or have balance and gait issues that take them longer to move through door openings. Additionally, I-1, Condition 2 Assisted Living care recipients are often frail and quite often struggle to have enough strength to open doors with automatic closers. It is a constant challenge to adjust closers to be able to reduce the amount of force needed to open the door, plus keep it open long enough for occupants to move through the opening, and then create enough force for the door to close and latch properly. Often, the last bit of the door swing closes fast to provide the proper latching, but then the door often hits the care recipient causing injury or even knocking them over.

The intent of this proposal is to allow for Group I-2, Condition 2 facilities to not require self-closing or automatic-closing corridor doors. The Healthcare committee feels that this will improve patient safety on a daily basis. There is a good balance of passive and active fire protection that will still be in place, and the fire and safety plans can include closing doors.

This is not intended to allow for the removal of self-closers or automatic-closers on the fire barriers around stairways or on the cross-corridor doors for smoke compartment.

This proposal is submitted by the ICC Committee for Healthcare (CHC).
The Committee on Healthcare (CHC) was established by the ICC Board of Directors in 2011 to pursue opportunities to study and develop effective and efficient provisions for Hospital, Nursing Homes, Assisted Living and Ambulatory Care Facilities. This committee was formed in cooperation with the American Society for Healthcare Engineering (ASHE). In July of 2017, the ICC Board made CHC a standing committee. In 2023 the CHC has held several virtual meetings open to any interested party. In addition, there were numerous virtual Working Group meetings for the current code development cycle, which included members of the committee as well as interested parties. Related documents and reports are posted on the CHC website at CHC webpage.

Cost Impact: Decrease

Estimated Immediate Cost Impact:

The average cost of door closers, not including the cost of labor for installation, ranges from $150 to $600 dollars. The total decrease

would depend on the number of sleeping room doors in the facility.

Estimated Immediate Cost Impact Justification (methodology and variables):

If a designer chooses to utilize this exception, closers would not be required on corridor doors.

FS65-24

FS66-24

IBC: 716.2.9, 716.2.9.1, 716.2.9.1.1, 716.2.9.4, 716.2.9.6

Proponents: Jonathan Roberts, UL Solutions, UL Solutions (jonathan.roberts@ul.com)

2024 International Building Code

Revise as follows:

716.2.9 Labeled protective assemblies.
Fire door assemblies shall be *listed* and *labeled* by an *approved agency*. The *labels* shall comply with NFPA 80, and shall be permanently affixed to the door or frame.

716.2.9.1 Fire door labeling requirements.
Fire doors shall be *labeled* showing the name of the manufacturer or other identification readily traceable back to the manufacturer, the name or trademark of the ~~third-party~~ *approved agency* ~~inspection agency~~, the *fire protection rating* and, where required for *fire doors* in *interior exit stairways and ramps* and *exit passageways* by Section 716.2.2.3, the maximum transmitted temperature end point. Smoke and draft control doors complying with UL 1784 shall be *labeled* as such and shall comply with Section 716.2.9.3. *Labels* shall be ~~*approved* and~~ permanently affixed. The *label* shall be applied at the factory or location where fabrication and assembly are performed.

716.2.9.1.1 Light kits, louvers and components.
Listed light kits and louvers and their required preparations shall be considered as part of the *labeled* door where such installations are done under the listing program of the *approved agency* ~~third-party agency~~. *Fire doors* and *fire door assemblies* shall be permitted to consist of components, including glazing, vision light kits and hardware that are *listed* or classified and *labeled* for such use by different *approved* ~~third-party~~ agencies.

716.2.9.4 Fire door frame labeling requirements.
Fire door frames shall be *labeled* showing the names of the manufacturer and the *approved agency* ~~third-party inspection agency~~.

716.2.9.6 Fire door operator labeling requirements.
Fire door operators for horizontal sliding doors shall be *listed* and *labeled* ~~and *listed*~~ for use with the assembly.

Reason: This proposal is essentially editorial and does not include any new technical requirements.

This proposal also follows standard IBC language for requirements for products to “listed and labeled” and changes “third-party” to “approved agency” as this term is defined in the IBC and is applicable to the intent of the existing reference to “third-party”.

It also revises the reference in 716.2.9.1 for the code official to approve the label itself.

IBC definition for easy reference:

APPROVED AGENCY. An established and recognized agency that is regularly engaged in conducting tests, furnishing inspection services or furnishing product certification where such agency has been approved by the building official.

Cost Impact: The change proposal is editorial in nature or a clarification and has no cost impact on the cost of construction

Justification for no cost impact:

This is simply an editorial change within the section and therefore there are no new technical requirements being proposed so it does not add cost.

FS67-24

IBC: 716.4, 716.4.1, 716.4.2, 716.4.3, TABLE 716.1(2), 716.4 (New), 716.4.1 (New), 716.4.2 (New), 716.4.2.1 (New), 716.4.2.2 (New), 716.4.2.3 (New), 716.4.3 (New), 716.4.4 (New)

Proponents: Paul Armstrong, McKEON (paul@7arms.com); Doug Zachary, McKEON, McKEON (dzachary@mckeondoor.com); David Dodge, McKEON (ddodge@mckeondoor.com)

2024 International Building Code

Delete without substitution:

~~**716.4 Fire protective curtain assembly.**~~

~~*Approved fire protective curtain assemblies* shall be constructed of any materials or assembly of component materials tested without hose stream in accordance with UL 10D, and shall comply with the Sections 716.4.1 through 716.4.3.~~

~~**716.4.1 Label.**~~

~~*Fire protective curtain assemblies* used as opening protectives in fire-rated walls and *smoke partitions* shall be*labeled* in accordance with Section 716.2.9.~~

~~**716.4.2 Smoke and draft control.**~~

~~*Fire protective curtain assemblies* used to protect openings where smoke and draft control assemblies are required shall comply with Section 716.2.1.4.~~

~~**716.4.3 Installation.**~~

~~*Fire protective curtain assemblies* shall be installed in accordance with NFPA 80.~~

Revise as follows:

TABLE 716.1(2) OPENING FIRE PROTECTION ASSEMBLIES, RATINGS AND MARKINGS

Portions of table not shown remain unchanged.

TYPE OF ASSEMBLY	REQUIRED WALL ASSEMBLY RATING (hours)		MINIMUM FIRE DOOR AND FIRE SHUTTER ASSEMBLY RATING (hours)	DOOR VISION PANEL SIZE[a]	FIRE-RATED GLAZING MARKING DOOR VISION PANEL[b, c]	MINIMUM SIDELIGHT/TRANSOM ASSEMBLY RATING (hours)		FIRE-RATED GLAZING MARKING SIDE-LIGHT/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 a	D-H-W-240	Not Permitted	4	Not Permitted	W-240
	3		3[d]	See Note a	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
Double fire walls constructed in accordance with NFPA 221	Single-wall assembly rating (hours)[e]	Each wall of the double-wall assembly (hours)[f]	—						
	4	3	3	See Note a	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

TYPE OF ASSEMBLY	REQUIRED WALL ASSEMBLY RATING (hours)		MINIMUM FIRE DOOR AND FIRE SHUTTER ASSEMBLY RATING (hours)	DOOR VISION PANEL SIZE	FIRE-RATED GLAZING MARKING DOOR VISION PANEL	MINIMUM SIDELIGHT/TRANSOM ASSEMBLY RATING (hours)		FIRE-RATED GLAZING MARKING SIDE-LIGHT/TRANSOM PANEL	
						Fire protection	Fire resistance	Fire protection	Fire resistance
	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.[b]	≤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[g]	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[d]	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-45	3/4[h]		D-H-45[h]	
Fire partitions: Corridor walls	1		1/3[a,j]	Maximum size tested	D-20	3/4[a]		D-H-OH-45	
	0.5		1/3[a,j]	Maximum size tested	D-20	1/3		D-H-OH-20	
Other fire partitions	1		3/4[i]	Maximum size tested	D-H-45	3/4		D-H-45	
	0.5		1/3	Maximum size tested	D-H-20	1/3		D-H-20	
Exterior walls	3		1 1/2	100 sq. in.[a]	≤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[h]	2	D-H-OH-90[h]	W-120
						Fire protection			
	1		3/4	Maximum size tested	D-H-45	3/4[h]		D-H-45[h]	
Smoke barriers						Fire protection			
	1		1/3[j]	Maximum size tested	D-20	3/4		D-H-OH-45	

For SI: 1 square inch = 645.2 mm.

a. Fire-resistance-rated glazing tested to ASTM E119 in accordance with Section 716.1.2.3 shall be permitted, in the maximum size tested.

b. Under the column heading “Fire-rated glazing marking door vision panel,” W refers to the fire-resistance rating of the glazing, not the frame.

c. See Section 716.1.2.2.1 and Table 716.1(1) for additional permitted markings.

d. 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.

e. As required in Section 706.4.

f. As allowed in Section 4.6 of NFPA 221.

g. See Section 716.2.5.1.2.

h. Fire-protection-rated glazing is not permitted for fire barriers required by Section 1207 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.

i. Two doors, each with a fire rating of 20 minutes, installed on opposite sides of the same opening in a fire partition, shall be deemed equivalent in fire protection rating to one 45-minute fire door.

j. *Fire protective curtain assemblies* in accordance with Section 716.4 shall be deemed equivalent in *fire protection rating* to 20-minute fire doors in *fire-resistance rated corridor* walls and *smoke barrier* walls.

Add new text as follows:

716.4 Fire protective curtain assemblies in corridors and smoke barriers. *Fire protective curtain assemblies* shall have a minimum *fire protection rating* of 20 minutes without the hose stream test where located in *corridor* walls and *smoke barrier* walls having a *fire-resistance rating* in accordance with Table 716.1(2) and shall comply with the provisions of this section.

716.4.1 Testing requirements. Approved fire protective curtain assemblies shall be constructed of any materials or assembly of component materials that conforms to the following test requirements:

1. Fire protective curtain assemblies shall be tested without hose stream in accordance with UL 10D.
2. Fire protective curtain assemblies shall be tested without hose stream in accordance with UL 10D.

716.4.2 Labeled protective assemblies. *Fire protective curtain assemblies* shall be labeled by an *approved agency*. The *labels* shall comply with NFPA 80, and shall be permanently affixed to the bottom bar.

716.4.2.1 Fire protective curtain assembly labeling requirements. *Fire protective curtain assemblies* shall be *labeled* showing the name of the manufacturer or other identification readily traceable back to the manufacturer, the name or trademark of the third-party inspection agency and the *fire protection rating*. Smoke and draft control assemblies complying with UL 1784 shall be *labeled* as such and shall comply with Section 716.4.2.3. Labels shall be approved and permanently affixed. The label shall be applied at the factory or location where fabrication and assembly are performed.

716.4.2.2 Oversized assemblies. Oversized fire protective curtain assemblies shall bear an oversized label by an approved agency or shall be provided with a certificate of inspection furnished by an approved testing agency. Where a certificate of inspection is furnished by an approved testing agency, the certificate shall state that the fire protective curtain assembly conforms to the requirements of design, materials and construction, but has not been subjected to the fire test.

716.4.2.3 Smoke and draft control assembly labeling requirements. Smoke and draft control assemblies complying with UL 1784 shall be labeled in accordance with Section 716.4.2.1 and shall show the letter “S” on the fire-rating label of the assembly.

716.4.3 Installation. *Installation of fire protective curtain assemblies* in corridors and smoke barriers shall be in accordance with NFPA 105.

716.4.4 Means of egress. *Fire protective curtain assemblies* shall not be used as required *means of egress* doors in accordance with Section 1010.

Reason: The fire protective curtain assembly definition in Section 202 and the UL 10D test standard in Section 716.4 have been recognized by the IBC since they were added in the 2021 code cycle. However, the full inclusion of these opening protectives in the IBC is incomplete as there is no mention of fire protective curtain assemblies in Table 716.1(2) nor are there any references to Section 716.4 anywhere in the code. This code change connects those missing links and assigns fire protective curtain assemblies to their rightful place in the IBC.

UL 10D test criteria is essentially the same positive pressure fire endurance test criteria in UL 10C, but without the requirement for a hose stream integrity test at the end of the burn. Therefore, our current codes will only allow the use of UL 10D tested products where fire door assemblies are not required to meet hose stream performance. This condition only occurs in Section 716.2.2.1:

716.2.2.1 Door assemblies in corridors and smoke barriers.

Fire door assemblies required to have a minimum fire protection rating of 20 minutes where located in corridor walls or smoke barrier walls having a fire-resistance rating in accordance with Table 716.1(2) shall be tested in accordance with NFPA 252 or UL 10C without the hose stream test.

There were attempts in the 2024 code cycle to add the UL 10D test standard to Section 716.2.2.1. But these attempts were disapproved largely because it was determined that this section is not the correct location since Section 716.2 covers fire door assemblies and Section 716.2.2.1 specifically refers to Table 716.1(2) which does not currently contain a reference to fire protective curtain assemblies. Based on that feedback, this code change accomplishes the following:

First, since fire protective curtain assemblies are a separate category of opening protective in Section 716.4, they cannot simply be placed under the requirements for fire door assemblies in Section 716.2. The only place fire protective curtain assemblies and fire door assemblies can be linked is through Table 716.1(2), which encompasses opening protectives of all types. Actually adding fire protective curtain assemblies within Table 716.1(2) is a complex task and unnecessary due to the limited applications that a UL 10D tested product can be legitimately placed. The simpler and more effective approach is to add the proposed footnote “j.” to Table 716.1(2) where Section 716.4 is now referenced. This proposed note, in accordance with the applications described in Section 716.2.2.1, will only be applied to the minimum fire door and fire shutter assembly ratings for “Fire partitions: Corridor Walls” and “Smoke Barriers”.

Next, Section 716.4 requires a complete rewrite in order to align it specifically with these applications. Since fire protective curtain assemblies are only deemed equivalent in fire protection rating to 20 minute fire doors in fire-resistance rated corridor walls and smoke barrier walls, Section 716.4 is rewritten to include similar language and layout found in Section 716.2.2.1. Furthermore, the subsections have been reformatted to create consistency in the layout with fire door assemblies and fire window assemblies in Sections 716.2 and 716.3, respectively.

The fire testing requirements for fire protective curtain assemblies in corridors and smoke barriers remains unchanged from the previous edition of the IBC. Additionally, these assemblies shall also serve as smoke and draft control assemblies meeting the criteria for air leakage for fire door assemblies in corridors and smoke barriers in Section 716.2.2.1.1 and being tested in accordance UL 1784.

Labeling requirements for fire protective curtain assemblies in the previous edition of the code referred back to labeling requirements for fire door assemblies in Section 716.2.9 which do not all apply to these types of opening protectives. Fire protective curtain assemblies have their own dedicated chapter in NFPA 80 and have been recognized as a separate and distinct category of opening protective by the IBC. This code change acknowledges the labeling requirements specific to fire protective curtain assemblies and has been structured in a format that is consistent with fire door assemblies.

Installation of all rated opening protectives must comply with NFPA 80 as required by Section 716.1. It is redundant and unnecessary to repeat this requirement in Section 716.4 so it has been removed in this code change. However, it is necessary to require fire protective curtain assemblies in corridors and smoke barriers to additionally be installed in accordance with NFPA 105 because of the smoke and draft control requirements. These installation requirements are consistent with fire door assemblies in the same applications as required by Section 716.2.10.

Finally, this code change confirms these products shall not be used as required means of egress doors. Fire protective curtain assemblies currently available in the market include many different features or options to travel through the opening protectives. These options include swinging flaps, grab straps, pass-through slots, push-to-open buttons and delayed deployment. None of these options that currently exist in fire protective curtain assemblies comply with means of egress doors in Section 1010.

Cost Impact: The change proposal is editorial in nature or a clarification and has no cost impact on the cost of construction

Justification for no cost impact:

This proposal recognizes the current practice of testing and use of these assemblies.

FS68-24

IBC: 717.1.1; IMC®: [BF] 607.1.1

Proponents: Tony Crimi, A.C. Consulting Solutions Inc., International Firestop Council (tcrimi@sympatico.ca)

2024 International Building Code

Revise as follows:

717.1.1 Ducts and air transfer openings.
Ducts transitioning horizontally between *shafts* shall not require a *shaft enclosure* provided that the duct penetration into each associated *shaft* is protected with *dampers* complying with this section.

Exception: Ducts that transition horizontally between shafts that penetrate fire resistance-rated walls without dampers where the surface of the duct is continuously covered on all sides from a point at which the duct penetrates a ceiling, wall or floor to the outlet terminal with a classified, listed and labeled material, system, method of construction or product specifically evaluated for such purpose, in accordance with nationally recognized standards for such enclosure materials and have a fire resistance-rating equal to the fire-resistance rating of the assembly being penetrated.

2024 International Mechanical Code

Revise as follows:

[BF] 607.1.1 Ducts between shafts. Ducts transitioning horizontally between shafts shall not require a shaft enclosure provided that the duct penetration into each associated shaft is protected with dampers complying with this section.

Exception: Ducts that transition horizontally between shafts that penetrate fire resistance-rated walls without dampers where the surface of the duct is continuously covered on all sides from a point at which the duct penetrates a ceiling, wall or floor to the outlet terminal with a classified, listed and labeled material, system, method of construction or product specifically evaluated for such purpose, in accordance with nationally recognized standards for such enclosure materials and have a fire resistance-rating equal to the fire-resistance rating of the assembly being penetrated.

Reason: This proposal provides an additional option for ducts that transition horizontally between shafts. Third-party certification organizations like UL and Intertek provide listing and labelling services for fire-resistant duct systems using a variety of nationally recognized Standards and applicable ICC-ES criteria. These Listings have been in the marketplace for many years and have proven their effectiveness. The many Listings for fire-resistant duct systems provide an alternate to required fire dampers when ducts pass through a fire separation. They also cover criteria to assess performance as shaft enclosures for vertical ducts.

Cost Impact: The change proposal is editorial in nature or a clarification and has no cost impact on the cost of construction

Justification for no cost impact:

This proposal adds an additional option for protection of ducts. It does not remove any existing provisions or mandate additional costs.

FS69-24

IBC: TABLE 717.3.2.1; IMC®: [BF] TABLE 607.3.2.1

Proponents: Jeanne Rice, NYSDOS (jeanne.rice@dos.ny.gov); Chad Sievers, NYS, NYS DOS (chad.sievers@dos.ny.gov); Kevin Duerr-Clark, NYS DOS, NYS DOS (kevin.duerr-clark@dos.ny.gov); China Clarke, New York State Dept of State, Manager Technical Support Unit (china.clarke@dos.ny.gov)

2024 International Building Code

Revise as follows:

TABLE 717.3.2.1 FIRE DAMPER RATING[a]

TYPE OF PENETRATION	MINIMUM DAMPER RATING (hours)
Less than 3-hour fire-resistance-rated assemblies	1.5
3-hour or greater fire-resistance-rated assemblies	3

a. Corridor fire dampers shall also comply with the provisions of section 717.3.2.4.

2024 International Mechanical Code

Revise as follows:

[BF] TABLE 607.3.2.1 FIRE DAMPER RATING[a]

TYPE OF PENETRATION	MINIMUM DAMPER RATING (hour)
Less than 3-hour fire-resistance-rated assemblies	$1^{1}/_{2}$
3-hour or greater fire-resistance-rated assemblies	3

a. Corridor fire dampers shall also comply with the provisions of section 607.3.2.4.

Reason: When looking for the required rating for fire dampers, users may consult Table 717.3.2.1 and determine the rating based solely on the information in this table, without noticing the provisions for corridor fire dampers in Section 717.3.2.4. The proposed change adds a footnote to Table 717.3.2.1 which references Section 717.3.2.4, to ensure users are aware of the corridor fire damper provisions.

Cost Impact: The change proposal is editorial in nature or a clarification and has no cost impact on the cost of construction

Justification for no cost impact:

The proposed change adds a reference to an existing section into the footnotes for an existing table. This change is for clarification only and does not add any provisions.

FS70-24

IBC: 717.3.3.1; IMC®: [BF] 607.3.3.1

Proponents: Amanda Hickman, The Hickman Group, Air Movement and Control Association International, Inc. (AMCA) (amanda@thehickmangroup.com)

2024 International Building Code

Revise as follows:

717.3.3.1 Fire damper actuation.
The operating temperature of the primary heat responsive devices used to actuate a *fire dampers* shall meet one of the following requirements:

1. The operating temperature shall be approximately 50°F (10°C) above the maximum design normal temperature of the air within the duct system. Additionally, the primary heat responsive device temperature shall be a minimum of but not less than 160°F (71°C) and shall not exceed:

   1.1. 212° F (100° C) for static rated dampers.

   1.2. 350° F (177° C) for dynamic rated dampers.

2. The operating temperature shall be not more than 350°F (177°C) where located in a smoke control system complying with Section 909.

2024 International Mechanical Code

Revise as follows:

[BF] 607.3.3.1 Fire damper actuation. The operating temperature of the P primary heat-responsive devices used to actuate a fire dampers shall meet one of the following requirements:

1. The operating temperature s Shall be approximately 50°F (28°C) above the maximum design normal temperature of the air within the duct system. Additionally, the primary heat responsive device temperature shall be a minimum of but not less than 160°F (71°C) and shall not exceed:.
   1.1 212° F (100° C) for static rated dampers.

   1.2 350° F (177° C) for dynamic rated dampers.

2. The operating temperature sShall be not more than 350°F (177°C) where located in a smoke control system complying with Section 909 of the International Building Code.

Reason:
The proposed modifications add technical clarity to this section. The current language states that the damper's operating temperature shall be 50 º F above the "normal temperature within the duct system". However, since the temperature within many ducts will vary significantly between heating and cooling seasons it is unclear what the "normal temperature" is. The intent of this section is to set the operating temperature of the damper to 50 º F above the "maximum design temperature of the air within the duct system" to avoid nuisance trips of the damper's operating device. The proposal also includes maximum limits to the operating temperature which are already required by section 717.3.1. The limits of 212 º F (100 º C) on static rated dampers and 350 º F (177 º C) on dynamic rated dampers come from the limits established in UL 555. Thus, these are the limits at which listings for dampers can be obtained.

Cost Impact: The change proposal is editorial in nature or a clarification and has no cost impact on the cost of construction

Justification for no cost impact:
The proposal is editorial. The cost will not be impacted by clarifying that "normal temperature" should read maximum design temperature and by adding

temperature limits to primary heat responsive devices.

FS70-24

FS71-24

IBC: 717.3.3.4; IMC®: [BF] 607.3.3.4

Proponents: Amanda Hickman, The Hickman Group, Air Movement and Control Association International, Inc. (AMCA) (amanda@thehickmangroup.com)

2024 International Building Code

Revise as follows:

717.3.3.4 Ceiling radiation damper actuation.
The operating temperature of a *ceiling radiation damper* actuation device shall be 50°F (27.8°C) above the ~~normal~~ maximum design temperature of the air within the duct system, but not less than 160°F (71°C).

2024 International Mechanical Code

Revise as follows:

[BF] 607.3.3.4 Ceiling radiation damper actuation. The operating temperature of a *ceiling radiation damper* actuation device shall be 50°F (28°C) above the ~~normal~~ maximum design temperature of the air within the duct system, but not less than 160°F (71°C).

Reason:
The proposed modifications add technical clarity to this section. The current language states that the damper's operating temperature shall be 50 º F above the "normal temperature within the duct system". However, since the temperature within many ducts will vary significantly between heating and cooling seasons it is unclear what the "normal temperature" is. The intent of this section is to set the operating temperature of the damper to 50 º F above the "maximum design temperature of the air within the duct system" to avoid nuisance trips of the damper's operating device.

Cost Impact: The change proposal is editorial in nature or a clarification and has no cost impact on the cost of construction

Justification for no cost impact:
This proposal is editorial. The cost will not be impacted by clarifying that "normal temperature" should read maximum design temperature.

FS72-24

IBC: 717.5.2; IMC®: [BF] 607.5.2

Proponents: Jeffrey Grove, Southern Nevada ICC Chapter (jeff.grove@coffman.com)

2024 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.

Exceptions: *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. <u>The duct shall not terminate at a wall register in a fire resistance-rated wall. The terminal shall be separated from terminals on the opposite side of the fire barrier by a minimum of 24".</u> Nonmetal flexible air connectors shall be permitted in the following locations:
   3.1. 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. 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.*

2024 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 512 and where the fire damper would interfere with the operation of the 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 of the International Building Code. For the purposes of this exception, a fully 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 air outlet and inlet terminals. <u>The duct shall not terminate at a wall register in a fire resistance-rated wall. The terminal shall be separated from terminals on the opposite side of the fire barrier by a minimum of 24".</u> Flexible air connectors shall be permitted in a fully ducted system, limited to the following installations:
   3.1. Nonmetallic flexible connections that connect a duct to an air handling unit or *equipment* located within a mechanical room in accordance with Section 603.9.
   3.2. Nonmetallic flexible air connectors in accordance with Section 603.6.2 that connect an overhead metal duct to a ceiling diffuser where the metal duct and ceiling diffuser are located within the same room.

Reason: The code language as currently written would allow for a duct to have openings on either side of a fire-resistant wall with no limitations. If duct openings were directly adjacent the wall on both sides of the assembly, fire could potentially use this path to ignite materials on the opposite side of the assembly negating its ability to resist the passage of fire. Requiring a minimum separation of duct terminals would limit the ability of fire to use the terminal openings to transfer from one side of the fire-resistant wall to the other.

Cost Impact: The change proposal is editorial in nature or a clarification and has no cost impact on the cost of construction

Justification for no cost impact:

The code change proposal is a clarification and will only impact the location of the terminals. The materials and labor to perform the installation should not be affected therefore no cost impact is anticipated.

FS72-24

FS73-24

IBC: 717.5.4; IMC®: [BF] 607.5.3

Proponents: Jeffrey Grove, Southern Nevada ICC Chapter (jeff.grove@coffman.com)

2024 International Building Code

Revise as follows:

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 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 $1\frac{1}{2}$-inch by $1\frac{1}{2}$-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, <u>are in areas of other than Group H</u>, 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. <u>The duct shall not terminate at a wall register in a fire resistance-rated wall. The terminal shall be separated from terminals on the opposite side of the fire barrier by a minimum of 24".</u>

2024 International Mechanical Code

Revise as follows:

[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 $1\frac{1}{2}$-inch by $1\frac{1}{2}$-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, are in areas of other than Group H, 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 air outlet and inlet terminals. The duct shall not terminate at a wall register in a fire resistance-rated wall. The terminal shall be separated from terminals on the opposite side of the fire barrier by a minimum of 24".

Reason: The code language as currently written would allow for a duct to have openings on either side of a fire-resistant wall with no limitations. If duct openings were directly adjacent the wall on both sides of the assembly, fire could potentially use this path to ignite materials on the opposite side of the assembly negating its ability to resist the passage of fire. Requiring a minimum separation of duct terminals would limit the ability of fire to use the terminal openings to transfer from one side of the fire-resistant wall to the other.

Excluding Group H occupancies from the exemption maintains the higher level of protection necessary to support the higher risk associated with the Group H occupancies. This language would also make the requirement consistent with requirements for fire barriers in section 717.5.2 exception 3.

Cost Impact: The change proposal is editorial in nature or a clarification and has no cost impact on the cost of construction

Justification for no cost impact:

The code change proposal is a clarification and will only impact the location of the terminals. The materials and labor to perform the installation should not be affected therefore no cost impact is anticipated.

FS73-24

FS74-24

IBC: 717.5.4

Proponents: Jeffrey Grove, Southern Nevada ICC Chapter (jeff.grove@coffman.com)

2024 International Building Code

Revise as follows:

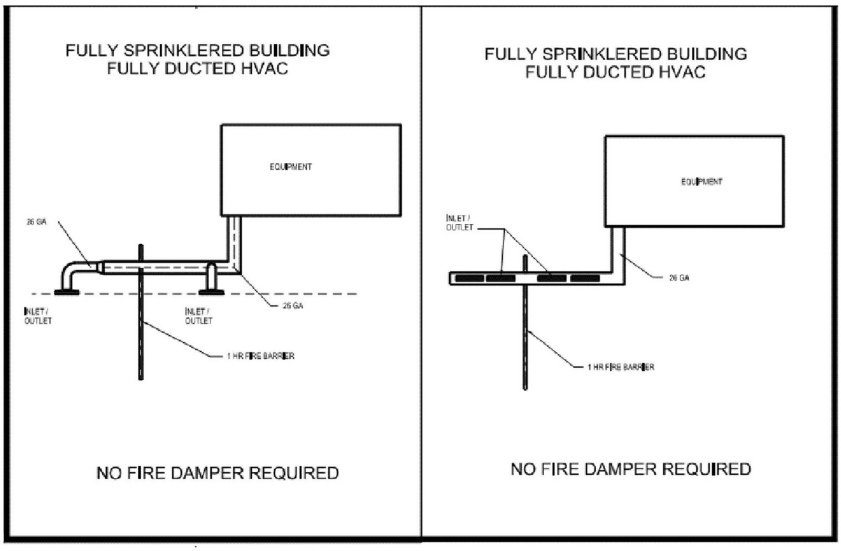
717.5.4 Fire partitions.
Ducts and air transfer openings that penetrate *fire partitions* shall be protected with *listed fire dampers* installed in accordance with their listing.

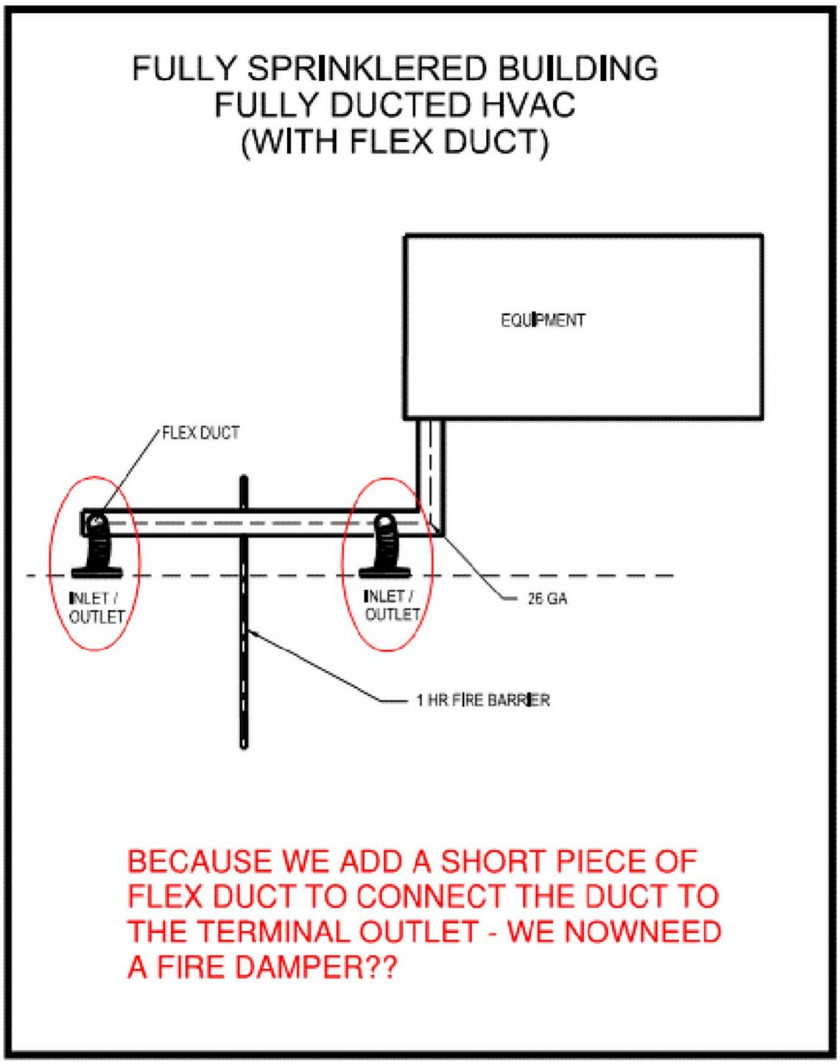
Exceptions: In occupancies other than Group H, *fire dampers* are not required where any of the following apply:

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 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 $1\frac{1}{2}$-inch by $1\frac{1}{2}$-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 air outlet and inlet terminals. Nonmetal flexible air connectors shall be permitted in the following locations:
   4.1 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*.
   4.2 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 inclusion of the non-metal flexible air connectors is to accurately reflect the typical installation. As currently written, the code allows for duct terminals on the metal duct without having to require fire dampers. The addition of a flexible duct connector to go from the metal duct to the ceiling terminal would require the use of a fire damper at the fire partition. Addition of a flexible duct connector in this case does not add to the fire risk of the assembly and should not require additional protection. This language is consistent with the language for fire barriers in Section 717.5.2 exception 3 that was adopted to the 2021 IBC under item FS67-18.

The attached exhibits show what is currently allowed per the code. As shown in the first exhibit, there is no limit in the location of the openings in the duct for terminals where no fire damper is required. The second exhibit shows that adding the flexible connector, no matter how far from the fire resistant wall it is, would require a damper to be added.





Cost Impact: Decrease

Estimated Immediate Cost Impact:

The code change proposal will decrease the construction cost by approximately $1200 per wall penetration. This cost savings would come from eliminating the cost to use a hard duct as the final connection and eliminating the fire damper. There is also a decrease in labor required. The average labor for a flexible duct connector is 15 minutes. The average to fabricate a 90 degree elbow and install a solid connector is approximately 2 hours. The cost of the fire damper could be $5,000 or more if it needs to be tied into the smoke control system.

Estimated Immediate Cost Impact Justification (methodology and variables):

Cost information was obtained from mechanical vendors and contractors.

FS74-24

FS75-24

IBC: 717.6.1; IMC®: [BF] 607.6.1

Proponents: Tony Crimi, A.C. Consulting Solutions Inc., International Firestop Council (tcrimi@sympatico.ca)

2024 International Building Code

Revise as follows:

717.6.1 Through penetrations.
A duct constructed of *approved* materials in accordance with the *International Mechanical Code* that penetrates a fire-resistance-rated floor/ceiling assembly that connects not more than two *stories* is permitted without *shaft enclosure* protection, provided that a *listed fire damper* is installed at the floor line or the duct is protected in accordance with Section 714.5. For air transfer openings, see Section 712.1.9.

Exceptions:

1. In occupancies other than Groups I-2 and I-3, a duct is permitted to penetrate three floors or less without a *fire damper* at each floor, provided that such duct meets all of the following requirements:
   1. ~~1~~ 1.1. The duct shall be contained and located within the cavity of a wall and shall be constructed of steel having a minimum wall thickness of 0.0187 inches (0.4712 mm) (No. 26 gage).
   2. ~~2~~ 1.2. The duct shall open into only one *dwelling unit* or *sleeping unit* and the duct system shall be continuous from the unit to the exterior of the *building*.
   3. ~~3~~ 1.3. The duct shall not exceed 4-inch (102 mm) nominal diameter and the total area of such ducts shall not exceed 100 square inches (0.065 m^2) in any 100 square feet (9.3 m^2) of floor area.
   4. ~~4~~ 1.4. The *annular space* around the duct is protected with materials that prevent the passage of flame and hot gases sufficient to ignite cotton waste where subjected to ASTM E119 or UL 263 time-temperature conditions under a minimum positive pressure differential of 0.01 inch of water (2.49 Pa) at the location of the penetration for the time period equivalent to the *fire-resistance rating* of the construction penetrated.
   5. ~~5~~ 1.5. Grille openings located in a ceiling of a fire-resistance-rated floor/ceiling or roof/ceiling assembly shall be protected with a *listed ceiling radiation damper* installed in accordance with Section 717.6.2.1.2
2. A duct is permitted to penetrate three floors or less without a fire damper at each floor provided the surface of the duct is continuously covered on all sides from a point at which the duct penetrates a ceiling or floor to the outlet terminal with a classified, listed and labeled system specifically evaluated for such purpose in accordance with nationally recognized standards for such enclosure materials, and penetrations comply with the requirements of Section 714.5 of the International Building Code.

2024 International Mechanical Code

Revise as follows:

[BF] 607.6.1 Through penetrations. A duct constructed of *approved* materials in accordance with Section 603 that penetrates a fire-resistance-rated floor/ceiling assembly that connects not more than two stories is permitted without shaft enclosure protection provided that a *listed* fire damper is installed at the floor line or the duct is protected in accordance with Section 714.5 of the International Building Code. For air transfer openings, see Item 6, Section 712.1.9 of the International Building Code.

~~Exception~~ Exceptions:

1. In occupancies other than Groups I-2 and I-3, a duct is permitted to penetrate three floors or less without a fire damper at each floor provided that it meets all of the following requirements:
   1. ~~1~~ 1.1. The duct shall be contained and located within the cavity of a wall and shall be constructed of steel having a minimum thickness of 0.0187 inch (0.4712 mm) (No. 26 gage).
   2. ~~2.~~ 1.2. The duct shall open into only one *dwelling unit* or *sleeping unit* and the duct system shall be continuous from the unit to the exterior of the *building*.
   3. ~~3.~~ 1.3. The duct shall not exceed a 4-inch (102 mm) nominal diameter and the total area of such ducts shall not exceed 100 square inches for any 100 square feet (64 516 mm^2 per 9.3 m^2) of the floor area.
   4. ~~4.~~ 1.4. The annular space around the duct is protected with materials that prevent the passage of flame and hot gases sufficient to ignite cotton waste when subjected to ASTM E119 or UL 263 time-temperature conditions under a minimum positive pressure differential of 0.01 inch (2.49 Pa) of water at the location of the penetration for the time period equivalent to the fire-resistance rating of the construction penetrated.
   5. ~~5.~~ 1.5. Grille openings located in a ceiling of a fire-resistance-rated floor/ceiling or roof/ceiling assembly shall be protected with a *listed ceiling radiation damper* installed in accordance with Section 607.6.2.1.

2. A duct is permitted to penetrate three floors or less without a fire damper at each floor provided the surface of the duct is continuously covered on all sides from a point at which the duct penetrates a ceiling or floor to the outlet terminal with a classified, listed and labeled system specifically evaluated for such purpose in accordance with nationally recognized standards for such enclosure materials, and penetrations comply with the requirements of Section 714.5 of the International Building Code.

Reason: This proposal provides an additional option for ducts that penetrate three or less floors. Third-party certification organizations like UL and Intertek provide listing and labelling services for fire-resistant duct systems using a variety of nationally recognized Standards and applicable ICC-ES criteria. These Listings have been in the marketplace for many years and have proven their effectiveness.

The many Listings for fire-resistant duct systems provide an alternate to required fire dampers when ducts pass through a fire separation. They also cover criteria to assess performance as shaft enclosures for vertical ducts.

Cost Impact: The change proposal is editorial in nature or a clarification and has no cost impact on the cost of construction

Justification for no cost impact:

This proposal adds an additional option for protection of ducts. It does not remove any existing provisions or mandate additional costs.

FS75-24

FS76-24

IBC: 717.6.2.1.1, 717.6.2.1.2

Proponents: Amanda Hickman, The Hickman Group, Air Movement and Control Association International, Inc. (AMCA) (amanda@thehickmangroup.com)

2024 International Building Code

Revise 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 that do not automatically shut down~~designed to operate with fans on~~ during a fire.

717.6.2.1.2 Static systems.
Static *ceiling radiation dampers* shall only be installed in ~~provided with~~ systems that ~~are~~ automatically shut down in the event of~~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 in 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 minimum velocity to operate.~~
2. ~~Where a static *ceiling radiation damper* is installed in a ceiling, the *ceiling radiation damper* shall be permitted to be controlled by a smoke detection system installed in the same room or area as the *ceiling radiation damper*.~~
3. ~~A static *ceiling radiation damper* shall be permitted to be installed in a room where an occupant sensor is provided within the room that will shut down the system.~~

Reason:

The changes to Sections 717.6.2.1.1 and 717.6.2.1.2 are editorial and align the description of dynamic and static systems with the code language already used in IBC section 717.2.3 outlining static dampers.

Exception 1 and Exception 2 are not exceptions to the charging language, but rather are specific methods for automatically shutting down a system in the event of a fire. Additionally, exception 2 as written, allows a static rated ceiling radiation damper to be controlled by a smoke detector without shutting down the system. This would result in the static damper having to close under airflow, which it is not listed to do.

Exception 3 does outline a true exception to the charging language as it describes a method for shutting down the system other than in the event of a fire. However, using an occupancy sensor to shut down the system could still result in the static rated damper having to close under airflow because many occupancy sensors utilize a delay prior to shutting the system down.

Cost Impact: The change proposal is editorial in nature or a clarification and has no cost impact on the cost of construction

Justification for no cost impact:

The proposed changes will not impact the cost of construction as they are only editorial and align system definitions with existing code language.

FS77-24

IBC: 717.6.2.1.1, 717.6.2.1.2; IMC®: [BF] 607.6.2.1.1, [BF] 607.6.2.1.2

Proponents: Eirene Knott, BRR Architecture, Metropolitan Kansas City Chapter of the ICC (eirene.knott@brrarch.com)

2024 International Building Code

Revise 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 that do not automatically shut down ~~designed to operate with fans on~~ 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 in the duct shall be within 5 feet (1524 mm) of each static ceiling radiation damper installed in the system. Air outlets and inlets shall not be located between the detector or tubes and the damper. Each detector shall be listed for the air velocity, temperature and humidity anticipated at the point where it is installed. Other than in mechanical smoke control systems, dampers shall be closed upon fan shutdown where local smoke detectors require a minimum velocity to operate.
2. A static ceiling radiation damper shall be permitted to be installed in a room where an occupant sensor is provided within the room that will shut down the system when the room is vacant.

717.6.2.1.2 Static systems.
Static *ceiling radiation dampers* shall only be provided in ~~with~~ systems that ~~are not designed to operate during~~ automatically shut down in the event of 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 in 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 minimum velocity to operate.~~
~~2. Where a static *ceiling radiation damper* is installed in a ceiling, the *ceiling radiation damper* shall be permitted to be controlled by a smoke detection system installed in the same room or area as the *ceiling radiation damper*.~~
~~3. A static *ceiling radiation damper* shall be permitted to be installed in a room where an occupant sensor is provided within the room that will shut down the system.~~

2024 International Mechanical Code

Revise as follows:

[BF] 607.6.2.1.1 Dynamic systems. *Ceiling radiation dampers* installed in heating, ventilation and air-conditioning systems that do not automatically shut down ~~designed to operate with fans on~~ during a fire shall be labeled for use in dynamic systems.

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 in the duct shall be within 5 feet (1524 mm) of each static ceiling radiation damper installed in the system. Air outlets and inlets shall not be located between the detector or tubes and the damper. Each detector shall be listed for the air velocity, temperature and humidity anticipated at the point where it is installed. Other than in mechanical smoke control systems, dampers shall be closed upon fan shutdown where local smoke detectors require a minimum velocity to operate
2. A static ceiling radiation damper shall be permitted to be installed in a room where an occupant sensor is provided within the room that will shut down the system when the room is vacant.

[BF] 607.6.2.1.2 Static systems. Static *ceiling radiation dampers* only shall be installed only in systems that ~~are not designed to operate during~~ automatically shut down in the event of 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 minimum velocity to operate.~~
2. ~~Where a static *ceiling radiation damper* is installed in a ceiling, the *ceiling radiation damper* shall be permitted to be controlled by a smoke detection system installed within the same room or area as the *ceiling radiation damper.*~~
3. ~~A static *ceiling radiation damper* shall be permitted to be installed within a room where an occupant sensor is provided within the room that will shut down the system.~~

Reason: As the original proponent of the language regarding the exceptions, it has been pointed out to me that perhaps the exceptions should be with the dynamic systems rather than the static systems as these exceptions are meant to allow some exceptions to the dynamic systems rather than the static systems. By moving the language from the static to the dynamic, it would make the code language more consistent with the intent. The current exception #2 is removed as it implies the static damper is motor driven and it is not. So they cannot be controlled by a smoke detection system.

Cost Impact: The change proposal is editorial in nature or a clarification and has no cost impact on the cost of construction

Justification for no cost impact:

This is only moving language from one section of the code to the more appropriate section.

FS77-24

FS78-24

IBC: 718.2.1

Proponents: Edward Lisinski, American Wood Council (elisinski@awc.org)

2024 International Building Code

Revise as follows:

718.2.1 Fireblocking materials.

Fireblocking shall consist of the following materials:

1. One layer of ~~Two~~2-inch (51 mm) nominal lumber.
2. Two ~~thicknesses~~ layers of 1-inch (25 mm) nominal lumber with broken lap joints.
3. One ~~thickness~~ layer of ~~0.719~~23/32-inch (18.3 mm) *wood structural panels* with joints backed by ~~0.719~~23/32-inch (18.3 mm) *wood structural panels.*
4. One ~~thickness~~ layer of ~~0.75~~3/4-inch (19.1 mm) *particleboard* with joints backed by ~~0.75~~3/4-inch (19.1 mm) *particleboard.*
5. One layer of ~~One-half~~1/2-inch (12.7 mm) *gypsum board.*
6. One layer of ~~One-fourth~~1/4-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 tested in the form and manner intended for use to demonstrate its ability to remain in place and to retard the spread of fire and hot gases.
9. *Mass timber* complying with Section 2304.11.
10. One ~~thickness~~ layer of $^{19}/_{32}$-inch (15.1 mm) *fire-retardant-treated wood* structural panel complying with Section 2303.2.

Reason: This change is for consistency only; no technical changes were intended to be made to this section. This change accomplishes three things for consistency:

- There were four items that described the number of layers of the material used but three did not. As a result of this change, all items would be described in number of layers where appropriate.
- There were three items that described the thickness of the material numerically using decimals, one item that described it numerically using fractions, and three items that described the thickness spelled out with words. As a result of this change, all material thicknesses would be described numerically, and by using fractions where appropriate.
- The term "thickness" was used to refer to the number of layers of each material. As a result of this change, any material that is to be installed in layers would use the term, "layers."

Cost Impact: The change proposal is editorial in nature or a clarification and has no cost impact on the cost of construction

Justification for no cost impact:

This proposal was made to create consistency for the materials permitted as fireblocking. No technical changes were intended to be made to this section.

FS79-24

IBC: 718.2.1, AWC Chapter 35 (New)

Proponents: Edward Lisinski, American Wood Council (elisinski@awc.org)

2024 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 tested in the form and manner intended for use to demonstrate its ability to remain in place and to retard the spread of fire and hot gases.
9. *Mass timber* complying with Section 2304.11.
10. One thickness of $^{19}/_{32}$-inch (15.1 mm) *fire-retardant-treated wood* structural panel complying with Section 2303.2.
11. Fireblocking materials in accordance with ANSI/AWC FDS.

Add new standard(s) as follows:

AWC

American Wood Council
222 Catoctin Circle SE, Suite 201
Leesburg, VA 20175

ANSI/AWC FDS-2024: Fire Design Specification (FDS) for Wood Construction

Staff Analysis: A review of the standard proposed for inclusion in the code, ANSI/AWC FDS-2024 Fire Design Specification (FDS) for Wood Construction, with regard to some of the key ICC criteria for referenced standards (Section 4.6 of CP#28) will be posted on the ICC website on or before March 18, 2024.

Reason: This proposal recognizes fireblocking materials in accordance with ANSI/AWC *2024 Fire Design Specification (FDS) for Wood Construction* Section 2.5.2 and adds a new reference to that standard in the code. The FDS includes prescriptive options for wood fireblocking of structural composite lumber and engineered wood rim board and for use of other wood members and wood protection materials designed in accordance with Chapter 3 of ANSI/AWC FDS to limit the passage of flames for at least 15 minutes. The minimum performance time of 15 minutes is based on performance associated with ½" gypsum board in Item 5 of IBC Section 718.2.1.

The FDS was developed as an American National Standard through the AWC ANSI-approved consensus standards development process, and is available on the AWC website at the following location: https://awc.org/wp-content/uploads/2023/11/AWC_FDS2024_20231103_AWCWEBSITE.pdf

Bibliography: ANSI/AWC *2024 Fire Design Specification (FDS) for Wood Construction*. View this document online: https://awc.org/wp-content/uploads/2023/11/AWC_FDS2024_20231103_AWCWEBSITE.pdf

Cost Impact: Decrease

Estimated Immediate Cost Impact:

$0

Estimated Immediate Cost Impact Justification (methodology and variables):

The proposal provides a reference to the FDS, which contains additional options for fireblocking materials which are not currently listed in Section 718.2.1, such as structural composite lumber and engineered wood rim board. The inclusion of this additional option does not in and of itself increase or decrease the overall cost impact of the code, because this option may or may not be chosen. The existing options are still relevant, and if chosen, have no cost impact on the actual code requirements.

FS79-24

FS80-24

IBC: TABLE 721.1(1)

Proponents: Stephen Szoke, American Concrete Institute, American Concrete Institute (steve.szoke@concrete.org); Amy Trygestad, Concrete Reinforcing Steel Institute, Concrete Reinforcing Steel Institute (atrygestad@crsi.org); Shamim Rashid-Sumar, National Ready Mixed Concrete Association, National Ready Mixed Concrete Association (ssumar@nrmca.org)

2024 International Building Code

Revise as follows:

TABLE 721.1(1) MINIMUM PROTECTION OF STRUCTURAL PARTS BASED ON TIME PERIODS FOR VARIOUS NONCOMBUSTIBLE INSULATING MATERIALS[m]

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
5. Reinforcing steel in reinforced concrete columns, beams girders and trusses	5-1.1	Carbonate, lightweight and sand-lightweight aggregate concrete, members 12" or larger, square or round. (Size limit does not apply to beams and girders monolithic with floors.)	$1^{1}/_{2}$	$1^{1}/_{2}$	$1^{1}/_{2}$	$1^{1}/_{2}$
		Siliceous aggregate concrete, members 12" or larger, square or round. (Size limit does not apply to beams and girders monolithic with floors.)	2	$1^{1}/_{2}$	$1^{1}/_{2}$	$1^{1}/_{2}$
6. Reinforcing steel in reinforced concrete joists[l]	6-1.1	Carbonate, lightweight and sand-lightweight aggregate concrete	$1^{1}/_{4}$	$1^{1}/_{4}$	1	$^{3}/_{4}$
	6-1.2	Siliceous aggregate concrete	$1^{3}/_{4}$	$1^{1}/_{2}$	1	$^{3}/_{4}$
7. Reinforcing steel and tie rods in floor and roof slabs[l]	7-1.1	Carbonate, lightweight and sand-lightweight aggregate concrete	1	1	$^{3}/_{4}$	$^{3}/_{4}$
	7-1.2	Siliceous aggregate concrete	$1^{1}/_{4}$	1	1	$^{3}/_{4}$

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 specified.

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

Reason: This code change adds the word “steel” to item 7 thereby aligning with items 5 and 6. This code change clarifies the provisions are only applicable to concrete reinforced with steel and are not applicable to concrete reinforced with glass fiber renforced polymer (GFRP) reinforcement in concrete.

Cost Impact: The change proposal is editorial in nature or a clarification and has no cost impact on the cost of construction

Justification for no cost impact:

This code change only adds the word “steel” to items 3, 4 and 7 thereby aligning with items 5 and 6 and providing needed clarify now that GFRP reinforced concrete is permitted in the IBC

FS80-24

FS81-24

IBC: TABLE 721.1(1)

Proponents: Bonnie Manley, AISC, AISC (manley@aisc.org); Jon-Paul Cardin, The CFSteel Group, The CFSteel Group (jp@cfsteelgroup.org)

2024 International Building Code

Revise as follows:

TABLE 721.1(1) MINIMUM PROTECTION OF STRUCTURAL PARTS BASED ON TIME PERIODS FOR VARIOUS NONCOMBUSTIBLE INSULATING MATERIALS[m]

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
1. Steel columns and all of primary trusses	1-1.1	Carbonate, lightweight and sand-lightweight aggregate concrete, members 6" × 6" or greater (not including sandstone, granite and siliceous gravel).[a]	2 1/2	2	1 1/2	1
	1-1.2	Carbonate, lightweight and sand-lightweight aggregate concrete, members 8" × 8" or greater (not including sandstone, granite and siliceous gravel).[a]	2	1 1/2	1	1
	1-1.3	Carbonate, lightweight and sand-lightweight aggregate concrete, members 12" × 12" or greater (not including sandstone, granite and siliceous gravel).[a]	1 1/2	1	1	1
	1-1.4	Siliceous aggregate concrete and concrete excluded in Item 1-1.1, members 6" × 6" or greater.[a]	3	2	1 1/2	1
	1-1.5	Siliceous aggregate concrete and concrete excluded in Item 1-1.1, members 8" × 8" or greater.[a]	2 1/2	2	1	1
	1-1.6	Siliceous aggregate concrete and concrete excluded in Item 1-1.1, members 12" × 12" or greater.[a]	2	1	1	1
	1-2.1	Clay or shale brick with brick and mortar fill.[a]	3 3/4	—	—	2 1/4
	~~1-3.1~~	~~4" hollow clay tile in two 2" layers; 1/2" mortar between tile and column; 3/8" metal mesh 0.046" wire diameter in horizontal joints; tile fill.[a]~~	~~4~~	—	—	—
	~~1-3.2~~	~~2" hollow clay tile; 3/4" mortar between tile and column; 3/8" metal mesh 0.046" wire diameter in horizontal joints; limestone concrete fill[a]; plastered with 3/4" gypsum plaster.~~	~~3~~	—	—	—
	~~1-3.3~~	~~2" hollow clay tile with outside wire ties 0.08" diameter at each course of tile or 3/8" metal mesh 0.046" diameter wire in horizontal joints; limestone or trap rock concrete fill[a] extending 1" outside column on all sides.~~	—	—	~~3~~	—
	~~1-3.4~~	~~2" hollow clay tile with outside wire ties 0.08" diameter at each course of tile with or without concrete fill; 3/4" mortar between tile and column.~~	—	—	—	~~2~~
	1-4.1	Cement plaster over metal lath wire tied to 3/4" cold-rolled vertical channels with 0.049" (No. 18 B.W. gage) wire ties spaced 3" to 6" on center. Plaster mixed 1: 2 1/2 by volume, cement to sand.	—	—	2 1/2[b]	7/8
	1-5.1	Vermiculite concrete, 1:4 mix by volume over paper-backed wire fabric lath wrapped directly around column with additional 2" × 2" 0.065"/0.065" (No. 16/16 B.W. gage) wire fabric placed 3/4" from outer concrete surface. Wire fabric tied with 0.049" (No. 18B.W. gage) wire spaced 6" on center for inner layer and 2" on center for outer layer.	2	—	—	—
	1-6.1	Perlite or vermiculite gypsum plaster over metal lath wrapped around column and furred 1 1/4" from column flanges. Sheets lapped at ends and tied at 6" intervals with 0.049" (No. 18 B.W. gage) tie wire. Plaster pushed through to flanges.	1 1/2	1	—	—
	1-6.2	Perlite or vermiculite gypsum plaster over self-furring metal lath wrapped directly around column, lapped 1" and tied at 6" intervals with 0.049" (No. 18 B.W. gage) wire.	1 3/4	1 3/8	1	—
	1-6.3	Perlite or vermiculite gypsum plaster on metal lath applied to 3/4" cold-rolled channels spaced 24" apart vertically and wrapped flatwise around column.	1 1/2	—	—	—
	1-6.4	Perlite or vermiculite gypsum plaster over two layers of 1/2" plain full-length gypsum lath applied tight to column flanges. Lath wrapped with 1" hexagonal mesh of No. 20-gage wire and tied with doubled 0.035" diameter (No. 18 B.W. gage) wire ties spaced 23" on center. For three-coat work, the plaster mix for the second coat shall not exceed 100 pounds of gypsum to 2 1/2 cubic feet of aggregate for the 3-hour system.	2 1/2	2	—	—
	1-6.5	Perlite or vermiculite gypsum plaster over one layer of 1/2" plain full-length gypsum lath applied tight to column flanges. Lath tied with doubled 0.049" (No. 18 B.W. gage) wire ties spaced 23" on center and scratch coat wrapped with 1" hexagonal mesh 0.035" (No. 20 B.W. gage) wire fabric. For three-coat work, the plaster mix for the second coat shall not exceed 100 pounds of gypsum to 2 1/2 cubic feet of aggregate.	—	2	—	—
	1-7.1	Multiple layers of 1/2" gypsum wallboard[c] adhesively[d] secured to column flanges and successive layers. Wallboard applied without horizontal joints. Corner edges of each layer staggered. Wallboard layer below outer layer secured to column with doubled 0.049" (No. 18 B.W. gage) steel wire ties spaced 15" on center. Exposed corners taped and treated.	—	—	2	1
	1-7.2	Three layers of 5/8" Type X gypsum wallboard.[c] First and second layer held in place by 1/8" diameter by 1 3/8" long ring shank nails with 5/16" diameter heads spaced 24" on center at corners. Middle layer also secured with metal straps at mid-height and 18" from each end, and by metal corner bead at each corner held by the metal straps. Third layer attached to corner bead with 1" long gypsum wallboard screws spaced 12" on center.	—	—	1 7/8	—
	1-7.3	Three layers of 5/8" Type X gypsum wallboard,[c] each layer screw attached to 1 5/8" steel studs 0.018" thick (No. 25 carbon sheet steel gage) at each corner of column. Middle layer also secured with 0.049" (No. 18 B.W. gage) double-strand steel wire ties, 24" on center. Screws are No. 6 by 1" spaced 24" on center for inner layer, No. 6 by 1 5/8" spaced 12" on center for middle layer and No. 8 by 2 1/4" spaced 12" on center for outer layer.	—	1 7/8	—	—
	~~1-8.1~~	~~Wood fibered gypsum plaster mixed 1:1 by weight gypsum to sand aggregate applied over metal lath. Lath lapped 1" and tied 6" on center at all end, edges and spacers with 0.049" (No. 18 B.W. gage) steel tie wires. Lath applied over 1/2" spacers made of 3/4" furring channel with 2" legs bent around each corner. Spacers located 1" from top and bottom of member and not greater than 40" on center and wire tied with a single strand of 0.049" (No. 18 B.W. gage) steel tie wires. Corner bead tied to the lath at 6" on center along each corner to provide plaster thickness.~~	—	—	~~1 5/8~~	—
	1-9.1	Minimum W8x35 wide flange steel column (w/d ≥ 0.75) with each web cavity filled even with the flange tip with normal weight carbonate or siliceous aggregate concrete (3,000 psi minimum compressive strength with 145 pcf ± 3 pcf unit weight). Reinforce the concrete in each web cavity with a minimum No. 4 deformed reinforcing bar installed vertically and centered in the cavity, and secured to the column web with a minimum No. 2 horizontal deformed reinforcing bar welded to the web every 18" on center vertically. As an alternative to the No. 4 rebar, 3/4" diameter by 3" long headed studs, spaced at 12" on center vertically, shall be welded on each side of the web mid-way between the column flanges.	—	—	—	See Note n
2. Webs or flanges of steel	2-1.1	Carbonate, lightweight and sand-lightweight aggregate concrete (not including sandstone, granite and siliceous gravel) with 3" or finer metal mesh placed 1" from the finished surface anchored to the top flange and providing not less than 0.025 square inch of steel area per foot in each direction.	2	1 1/2	1	1

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
beams and girders	2-1.2	Siliceous aggregate concrete and concrete excluded in Item 2-1.1 with 3" or finer metal mesh placed 1" from the finished surface anchored to the top flange and providing not less than 0.025 square inch of steel area per foot in each direction.	2 1/2	2	1 1/2	1
	2-2.1	Cement plaster on metal lath attached to 3/4" cold-rolled channels with 0.04" (No. 18 B.W. gage) wire ties spaced 3" to 6" on center. Plaster mixed 1: 2 1/2 by volume, cement to sand.	—	—	2 1/2[b]	7/8
	2-3.1	Vermiculite gypsum plaster on a metal lath cage, wire tied to 0.165" diameter (No. 8 B.W. gage) steel wire hangers wrapped around beam and spaced 16" on center. Metal lath ties spaced approximately 5" on center at cage sides and bottom.	—	7/8	—	—
	2-4.1	Two layers of 5/8" Type X gypsum wallboard[c] are attached to U-shaped brackets spaced 24" on center. 0.018" thick (No. 25 carbon sheet steel gage) 1 5/8" deep by 1" galvanized steel runner channels are first installed parallel to and on each side of the top beam flange to provide a 1/2" clearance to the flange. The channel runners are attached to steel deck or concrete floor construction with approved fasteners spaced 12" on center. U-shaped brackets are formed from members identical to the channel runners. At the bent portion of the U-shaped bracket, the flanges of the channel are cut out so that 1 5/8"-deep corner channels can be inserted without attachment parallel to each side of the lower flange. As an alternative, 0.021" thick (No. 24 carbon sheet steel gage) 1" × 2" runner and corner angles shall be used in lieu of channels, and the web cutouts in the U-shaped brackets shall not be required. Each angle is attached to the bracket with 1/2"-long No. 8 self-drilling screws. The vertical legs of the U-shaped bracket are attached to the runners with one 1/2"-long No. 8 self-drilling screw. The completed steel framing provides a 2 1/8" and 1 1/2" space between the inner layer of wallboard and the sides and bottom of the steel beam, respectively. The inner layer of wallboard is attached to the top runners and bottom corner channels or corner angles with 1 1/4"-long No. 6 self-drilling screws spaced 16" on center. The outer layer of wallboard is applied with 1 3/4"-long No. 6 self-drilling screws spaced 8" on center. The bottom corners are reinforced with metal corner beads.	—	—	1 1/4	—
	2-4.2	Three layers of 5/8" Type X gypsum wallboard[c] attached to a steel suspension system as described immediately above utilizing the 0.018" thick (No. 25 carbon sheet steel gage) 1" × 2" lower corner angles. The framing is located so that a 2 1/8" and 2" space is provided between the inner layer of wallboard and the sides and bottom of the beam, respectively. The first two layers of wallboard are attached as described immediately above. A layer of 0.035" thick (No. 20 B.W. gage) 1" hexagonal galvanized wire mesh is applied under the soffit of the middle layer and up the sides approximately 2". The mesh is held in position with the No. 6 1 5/8"-long screws installed in the vertical leg of the bottom corner angles. The outer layer of wallboard is attached with No. 6 2 1/4"-long screws spaced 8" on center. One screw is installed at the mid-depth of the bracket in each layer. Bottom corners are finished as described above.	—	1 7/8	—	—
3. Bonded pretensioned reinforcement in prestressed concrete[e]	3-1.1	Carbonate, lightweight, sand-lightweight and siliceous[f] aggregate concrete				
		Beams or girders	4[g]	3[g]	2 1/2	1 1/2
		Solid[h]	2	1 1/2	1	
4. Bonded or unbonded post-tensioned tendons in prestressed concrete[e, i]	4-1.1	Carbonate, lightweight, sand-lightweight and siliceous[f] aggregate concrete Unrestrained members:				
		Solid slabs[h]	—	2	1 1/2	—
		Beams and girders[j]				
		8" wide	4 1/2	2 1/2	1 3/4	
		greater than 12" wide	3	2 1/2	2	1 1/2
	4-1.2	Carbonate, lightweight, sand-lightweight and siliceous aggregate Restrained members:[k]				
		Solid slabs[h]	1 1/4	1	3/4	—
		Beams and girders[j]				
		8" wide	2 1/2	2	1 3/4	—
		greater than 12" wide	2	1 3/4	1 1/2	—
5. Reinforcing steel in reinforced concrete columns, beams girders and trusses	5-1.1	Carbonate, lightweight and sand-lightweight aggregate concrete, members 12" or larger, square or round. (Size limit does not apply to beams and girders monolithic with floors.)	1 1/2	1 1/2	1 1/2	1 1/2
		Siliceous aggregate concrete, members 12" or larger, square or round. (Size limit does not apply to beams and girders monolithic with floors.)	2	1 1/2	1 1/2	1 1/2
6. Reinforcing steel in reinforced concrete joists[l]	6-1.1	Carbonate, lightweight and sand-lightweight aggregate concrete	1 1/4	1 1/4	1	3/4
	6-1.2	Siliceous aggregate concrete	1 3/4	1 1/2	1	3/4
7. Reinforcing and tie rods in floor and roof slabs[l]	7-1.1	Carbonate, lightweight and sand-lightweight aggregate concrete	1	1	3/4	3/4
	7-1.2	Siliceous aggregate concrete	1 1/4	1	1	3/4

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 specified.

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

Reason: This proposal is one of three that fully update Chapter 7 provisions of the IBC to reflect current structural steel industry standards. The 2024 edition of the IBC has already adopted the 2022 edition of AISC 360, *Specification for Structural Steel Buildings*, in Chapter 35 and elsewhere (Sections 722.5.2.2.1, 1604.3.3, 1705.2.1, 2202.1, and 2202.2.1.1). The purpose of this proposal is to delete five archaic systems that are no longer included for new building applications in AISC 360-22's mandatory Appendix 4, Structural Design for Fire Conditions, (specifically Appendix 4, Section 4.3). These entries have been retained in AISC 360 Appendix 4 commentary for historical purposes.

AISC makes its standards available to all free of charge. AISC 360-22 can be downloaded for free from https://www.aisc.org/publications/steel-standards/.

Bibliography: AISC (2022), *Specification for Structural Steel Buildings*, ANSI/AISC 360-22, American Institute of Steel Construction, Chicago, Ill., August 1, 2022.
Available at: https://www.aisc.org/publications/steel-standards/.

Cost Impact: The change proposal is editorial in nature or a clarification and has no cost impact on the cost of construction

Justification for no cost impact:

This proposal clarifies the application of a standard already adopted in the 2024 IBC.

FS82-24

IBC: TABLE 721.1(2), AWC Chapter 35 (New)

Proponents: Edward Lisinski, American Wood Council (elisinski@awc.org)

2024 International Building Code

Revise as follows:

TABLE 721.1(2) RATED FIRE-RESISTANCE PERIODS FOR VARIOUS WALLS AND PARTITIONS[a, o, p, r]

Portions of table not shown remain unchanged.

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For SI: 1 inch = 25.4 mm, 1 square inch = 645.2 mm^2, 1 cubic foot = 0.0283 m^3.

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

b. Thickness shown for brick and clay tile is nominal thicknesses unless plastered, in which case thicknesses are net. Thickness shown for concrete masonry and clay masonry is equivalent thickness defined in Section 722.3.1 for concrete masonry and Section 722.4.1.1 for clay masonry. Where all cells are solid grouted or filled with silicone-treated perlite loose-fill insulation; vermiculite loose-fill insulation; or expanded clay, shale or slate lightweight aggregate, the equivalent thickness shall be the thickness of the block or brick using specified dimensions as defined in Chapter 21. Equivalent thickness shall include the thickness of applied plaster and lath or gypsum wallboard, where specified.

c. For units in which the net cross-sectional area of cored brick in any plane parallel to the surface containing the cores is not less than 75 percent of the gross cross-sectional area measured in the same plane.

d. Shall be used for nonbearing purposes only.

e. For all of the construction with gypsum wallboard described in this table, gypsum base for veneer plaster of the same size, thickness and core type shall be permitted to be substituted for gypsum wallboard, provided 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.

f. The fire-resistance time period for concrete masonry units meeting the equivalent thicknesses required for a 2-hour fire-resistance rating in Item 3, and having a thickness of not less than 7 $^5/_8$ inches is 4 hours where cores that are not grouted are filled with silicone-treated perlite loose-fill insulation; vermiculite loose-fill insulation; or expanded clay, shale or slate lightweight aggregate, sand or slag having a maximum particle size of $^3/_8$ inch.

g. The fire-resistance rating of concrete masonry units composed of a combination of aggregate types or where plaster is applied directly to the concrete masonry shall be determined in accordance with ACI 216.1/TMS 216. Lightweight aggregates shall have a maximum combined density of 65 pounds per cubic foot.

h. See Note b. The equivalent thickness shall be permitted to include the thickness of cement plaster or 1.5 times the thickness of gypsum plaster applied in accordance with the requirements of Chapter 25.

i. Concrete walls shall be reinforced with horizontal and vertical temperature reinforcement as required by Chapter 19.

j. Studs are welded truss wire studs with 0.18 inch (No. 7 B.W. gage) flange wire and 0.18 inch (No. 7 B.W. gage) truss wires.

k. Nailable metal studs consist of two channel studs spot welded back to back with a crimped web forming a nailing groove.

l. Wood structural panels shall be permitted to be installed between the fire protection and the wood studs on either the interior or exterior side of the wood frame assemblies in this table, provided that the length of the fasteners used to attach the fire protection is increased by an amount not less than the thickness of the wood structural panel.

m. For studs with a slenderness ratio, l_e/d, greater than 33, the design stress shall be reduced to 78 percent of allowable F'_c. For studs with a slenderness ratio, l_e/d, not exceeding 33, the design stress shall be reduced to 78 percent of the adjusted stress F'_c calculated for studs having a slenderness ratio l_e/d of 33.

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

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

p. NCMA TEK 5-8A shall be permitted for the design of fire walls.

q. The studs in this assembly can be designed without fire-related capacity reductions.

r. Fire-resistance-rated assemblies, as prescribed in the ANSI/AWC FDS, shall be permitted.

Add new standard(s) as follows:

AWC

American Wood Council
222 Catoctin Circle SE, Suite 201
Leesburg, VA 20175

ANSI/AWC FDS-2024: Fire Design Specification (FDS) for Wood Construction

Staff Analysis: A review of the standard proposed for inclusion in the code, ANSI/AWC FDS-2024 Fire Design Specification (FDS) for Wood Construction, with regard to some of the key ICC criteria for referenced standards (Section 4.6 of CP#28) will be posted on the ICC website on or before March 18, 2024.

Reason: This proposal adds reference to ANSI/AWC *2024 Fire Design Specification (FDS) for Wood Construction* in footnote “r” for tested fire-resistance-rated assemblies in the FDS and adds it as a reference standard. There is significant overlap between FDS and Table 721.1(2), however additional tested assemblies are provided in FDS Section 3.8. For cases where there is overlap, reference to the FDS provides additional construction details and figures. The use of a reference to provide additional tested fire-resistance-rated assemblies in the FDS in footnote "r" is consistent with the existing reference to GA-600 in footnote "o".

The FDS was developed as an American National Standard through the AWC ANSI-approved consensus standards development process, and is available on the AWC website at the following location: https://awc.org/wp-content/uploads/2023/11/AWC_FDS2024_20231103_AWCWEBSITE.pdf

Bibliography: ANSI/AWC *2024 Fire Design Specification (FDS) for Wood Construction.* View this document online: https://awc.org/wp-content/uploads/2023/11/AWC_FDS2024_20231103_AWCWEBSITE.pdf

Cost Impact: Decrease

Estimated Immediate Cost Impact:

$0

Estimated Immediate Cost Impact Justification (methodology and variables):

The proposal provides a reference to the FDS, which contains detailed requirements for tested fire-resistance-rated assembles to facilitate proper use and additional tested assemblies not appearing in Table 721.1(2) to provide more options to meet fire-resistance requirements. The inclusion of this additional option does not in and of itself increase or decrease the overall cost impact of the code, because this option may or may not be chosen. The existing options are still relevant, and if chosen, have no cost impact on the actual code requirements.

FS83-24

IBC: TABLE 721.1(3), AWC Chapter 35 (New)

Proponents: Edward Lisinski, American Wood Council (elisinski@awc.org)

2024 International Building Code

Revise as follows:

TABLE 721.1(3) MINIMUM PROTECTION FOR FLOOR AND ROOF SYSTEMS [a, q, r]

Portions of table not shown remain unchanged.

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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 specified.

r. Fire-resistance-rated assemblies, as prescribed in the ANSI/AWC FDS, shall be permitted.

Add new standard(s) as follows:

AWC

American Wood Council
222 Catoctin Circle SE, Suite 201
Leesburg, VA 20175

ANSI/AWC FDS-2024: Fire Design Specification (FDS) for Wood Construction

Staff Analysis: A review of the standard proposed for inclusion in the code, ANSI/AWC FDS-2024 Fire Design Specification (FDS) for Wood Construction, with regard to some of the key ICC criteria for referenced standards (Section 4.6 of CP#28) will be posted on the ICC website on or before March 18, 2024.

Reason: This proposal adds reference to ANSI/AWC 2024 *Fire Design Specification (FDS) for Wood Construction* in footnote “r” for tested fire-resistance-rated assemblies in the FDS and adds it as a reference standard. There is significant overlap between FDS and Table 721.1(3), however additional tested assemblies are provided in FDS Section 3.8. For cases where there is overlap, reference to the FDS provides additional construction details and figures. The use of a reference to provide additional tested fire-resistance rated assemblies in the FDS in footnote "r" is consistent with the existing reference to GA-600 in footnote "q".

The FDS was developed as an American National Standard through the AWC ANSI-approved consensus standards development process, and is available on the AWC website at the following location: https://awc.org/wp-content/uploads/2023/11/AWC_FDS2024_20231103_AWCWEBSITE.pdf

Bibliography: ANSI/AWC *2024 Fire Design Specification (FDS) for Wood Construction.* View this document online: https://awc.org/wp-content/uploads/2023/11/AWC_FDS2024_20231103_AWCWEBSITE.pdf

Cost Impact: Decrease

Estimated Immediate Cost Impact:

$0

Estimated Immediate Cost Impact Justification (methodology and variables):

The proposal provides a reference to the FDS, which contains detailed requirements for tested fire-resistance-rated assembles to facilitate proper use and additional tested assemblies not appearing in Table 721.1(3) to provide more options to meet fire-resistance requirements. The inclusion of this additional option does not in and of itself increase or decrease the overall cost impact of the code, because this option may or may not be chosen. The existing options are still relevant, and if chosen, have no cost impact on the actual code requirements.

FS84-24

IBC: 721.1, 721.1.1 (New), 721.1.2 (New)

Proponents: Stephen Szoke, American Concrete Institute, American Concrete Institute (steve.szoke@concrete.org); Shamim Rashid-Sumar, National Ready Mixed Concrete Association, National Ready Mixed Concrete Association (ssumar@nrmca.org); Nicholas Lang, Concrete Masonry & Hardscapes Association, Masonry Alliance for Codes & Standards (nlang@ncma.org)

2024 International Building Code

Revise as follows:

721.1 General.
The provisions of this section contain prescriptive details of fire-resistance-rated *building elements*, components or assemblies. The materials of construction specified in Tables 721.1(1), 721.1(2) and 721.1(3) shall be assumed to have the *fire-resistance ratings* prescribed therein. Where materials that change the capacity for heat dissipation are incorporated into a fire-resistance-rated assembly, fire test results or other substantiating data shall be made available to the *building official* to show that the required *fire-resistance-rating* time period is not reduced.

Add new text as follows:

721.1.1 Concrete. Prescriptive details of fire resistance-rated concrete building components shall comply with Section 721.1, ACI/TMS 216.1, or PCI 124.

721.1.2 Masonry. Prescriptive details of fire resistance-rated masonry building components shall comply with Section 721.1 or ACI/TMS 216.1.

Reason: This change adds the prescriptive fire resistance ratings for concrete and masonry assemblies compliant with ACI/TMS 216.1 Code Requirements for Determining the Fire Resistance Rating of Concrete and Masonry Construction Assemblies. ACI/TMS 216.1 provides prescriptive requirements for fire resistance-rated concrete and masonry and thus, is a viable alternative compliance path for Section 721. ACI/TMS 216.1 is already referenced in Section 722 Calculated Fire Resistance. The prescriptive requirements are in addition to those of Section 721.

Cost Impact: The change proposal is editorial in nature or a clarification and has no cost impact on the cost of construction

Justification for no cost impact:

No technical changes. Proposal cites an existing referenced standard that provides additional prescriptive options.

FS85-24

IBC: SECTION 722, 722.1

Proponents: Bonnie Manley, AISC, AISC (manley@aisc.org); Jon-Paul Cardin, The CFSteel Group, The CFSteel Group (jp@cfsteelgroup.org)

2024 International Building Code

SECTION 722
CALCULATED FIRE RESISTANCE

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 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. Steel assemblies and composite steel and concrete assemblies shall be permitted in accordance with AISC 360 Appendix 4, Section 4.3~~Chapter 5 of ASCE 29~~.
4. Exposed wood members and wood decking shall be permitted in accordance with Chapter 16 of ANSI/AWC NDS.

Reason: This proposal is one of three that fully update Chapter 7 provisions of the IBC to reflect current structural steel industry standards. The 2024 edition of the IBC has already adopted the 2022 edition of AISC 360, *Specification for Structural Steel Buildings*, in Chapter 35 and elsewhere (Sections 722.5.2.2.1, 1604.3.3, 1705.2.1, 2202.1, and 2202.2.1.1). The purpose of this proposal is to update the methodology for the calculation of fire resistance for structural steel assemblies to recognize the applicable portion of AISC 360-22's mandatory Appendix 4, Structural Design for Fire Conditions (specifically Appendix 4, Section 4.3). The proposal also expands the reference to include composite steel and concrete assemblies, which are newly added in the 2022 edition of AISC 360, Appendix 4, Section 4.3.

Since the 2003 edition, the IBC has included ASCE 29, *Standard Calculation Methods for Structural Fire Protection,* as the only means to calculate the fire resistance of steel assemblies. The first edition of ASCE 29 referenced in the 2003 IBC was the 1999 edition; today, the 2024 IBC references the 2005 edition (although the 11/1/23 IBC-24 errata notes a 2017 edition; however, it is not available on the ASCE website for purchase as of 1/8/24). Since the 2006 edition of the IBC, the IBC has mandated AISC 360 as the basis for the design, fabrication, and erection of structural steel buildings. The first edition of AISC 360 referenced in the 2006 IBC was the 2005 edition, and today, the 2024 IBC references the 2022 edition.

In 2005, the committee charged with the development of AISC 360 created a new AISC 360 Appendix 4, Section 4.3 to provide calculation methods for establishing fire-resistance ratings of steel assemblies that would otherwise be determined by standard testing. AISC 360-05, Appendix 4, Section 4.3 also included a direct reference to the ASCE 29-05 calculation procedures for determining the fire-resistance ratings of steel assemblies. While intervening editions of AISC 360 Appendix 4, Section 4.3 have included this reference to ASCE 29-05, for the 2022 edition of AISC 360, the committee chose to extract the applicable calculation procedures directly from ASCE 29-05 and combine them with newly developed provisions. So, the 2024 IBC now effectively includes references to two (2) documents containing the same material on the prescriptive calculation of fire resistance for steel assemblies. However, while ASCE 29 has remained static, the methodology now found in Appendix 4, Section 4.3 of AISC 360-22 has been enhanced to reflect the latest requirements based on research, analysis, and testing. By deleting the direct reference to ASCE 29 and, instead, referencing AISC 360, this proposal streamlines the IBC by citing only one (1) document with the most complete and up-to-date provisions for determining the fire resistance of steel assemblies and composite steel and concrete assemblies.

AISC makes its standards available to all free of charge. AISC 360-22 can be downloaded for free from https://www.aisc.org/publications/steel-standards/. Please refer to the full AISC 360-22 commentary for technical background and guidance on applying the provisions.

From the AISC-360 Commentary on Appendix 4, Section 4.3: "The primary source of accepted fire-resistance calculations for structural steel has been AISI and its ASTM E119 fire research conducted throughout the 1970s and 1980s. These industry-sponsored developments were originally captured in three AISI design guide publications (AISI, 1980, 1981, 1984), which were subsequently included in the preceding and current editions of Section 5 of SEI/ASCE/SFPE Standard 29, Standard Calculation Methods for Structural Fire Protection (ASCE, 2005) and in the U.S. model building codes. More recently, all of this information was summarized and well illustrated in AISC Design Guide 19. The standard fire protection and fire-resistance calculation methods for structural steel have now also been consistently transferred into the current National Fire Protection Association (NFPA) and International Code Council (ICC) model building codes. The inclusion of provisions for fire-resistance calculations in this Specification was motivated by AISC's and the steel industry's interest in duly maintaining this important content and contributing to its future progress. In this manner, AISC desires to parallel the development of prescriptive fire-resistive criteria for the concrete, masonry, and timber industries that are embodied in separate standards authored by the respective committees."

Bibliography: AISC (2022), *Specification for Structural Steel Buildings*, ANSI/AISC 360-22, American Institute of Steel Construction, Chicago, Ill., August 1, 2022.

Available at: https://www.aisc.org/publications/steel-standards/.

Cost Impact: The change proposal is editorial in nature or a clarification and has no cost impact on the cost of construction

Justification for no cost impact:

This proposal the application of a standard already adopted in the 2024 IBC.

FS85-24

FS86-24

IBC: 722.1

Proponents: Stephen Szoke, American Concrete Institute, American Concrete Institute (steve.szoke@concrete.org); Shamim Rashid-Sumar, National Ready Mixed Concrete Association, National Ready Mixed Concrete Association (ssumar@nrmca.org); Nicholas Lang, Concrete Masonry & Hardscapes Association, Representing Masonry Alliance for Codes and Standards, Masonry Alliance for Codes & Standards (nlang@ncma.org)

2024 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 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. Steel assemblies shall be permitted in accordance with Chapter 5 of ASCE 29.
4. Exposed wood members and wood decking shall be permitted in accordance with Chapter 16 of ANSI/AWC NDS.
5. Steel columns protected with concrete or masonry and hollow steel tubes filled with concrete shall be permitted in accordance with ACI/TMS 216.1

Reason: This code change proposal adds ACI/TMS 216.1 as a compliance path for structural steel columns protected with concrete or masonry and hollow structural steel columns filled with concrete. ACI/TMS 216.1 continues to provide the methods to provide fire protection for structural steel columns using concrete or masonry and fire resistance ratings for hollow steel columns filled with concrete. This adds an alternative to ASCE 29 as an additional resource for determining compliance.

Cost Impact: The change proposal is editorial in nature or a clarification and has no cost impact on the cost of construction

Justification for no cost impact:

This changes does not increase cost as it provides an alternative compliance method to those already permitted in the code.

FS87-24

IBC: 722.1

Proponents: Stephen Szoke, American Concrete Institute, American Concrete Institute (steve.szoke@concrete.org); Shamim Rashid-Sumar, National Ready Mixed Concrete Association, National Ready Mixed Concrete Association (ssumar@nrmca.org)

2024 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 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 or ACI/TMS 216.1.
3. Steel assemblies shall be permitted in accordance with Chapter 5 of ASCE 29.
4. Exposed wood members and wood decking shall be permitted in accordance with Chapter 16 of ANSI/AWC NDS.

Reason: This proposal clarifies that ACI/TMS 216.1 is a appropriate for determining the fire resistance ratings of precast, prestressed concrete assemblies. Item 1, does not distinguish between prestressed and non-prestressed assemblies and both are covered in ACI/TMS 216.1. By reading Item 2 as currently written implies that only compliance with PCI 124 is acceptable precast, prestressed concrete assemblies. Prior to the addition of PCI 124 to the IBC, the user was directed to ACI/TMS 216.1 for all concrete assemblies including precast, prestressed concrete. This change provides clarity that ACI/TMS 216.1 remains an appropriate compliance path for precast, prestressed concrete assemblies.

Cost Impact: The change proposal is editorial in nature or a clarification and has no cost impact on the cost of construction

Justification for no cost impact:

No technical change, simply clarifies that ACI/TMS 216.1 remains applicable for precast, prestressed concrete, per Item 1

FS88-24

IBC: 722.1, AWC Chapter 35 (New)

Proponents: Edward Lisinski, American Wood Council (elisinski@awc.org)

2024 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 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. Steel assemblies shall be permitted in accordance with Chapter 5 of ASCE 29.
4. Exposed wood members and wood decking shall be permitted in accordance with Chapter 16 of ANSI/AWC NDS.
5. Wood members and assemblies shall be permitted in accordance with ANSI/AWC FDS.

Add new standard(s) as follows:

AWC

American Wood Council
222 Catoctin Circle SE, Suite 201
Leesburg, VA 20175

ANSI/AWC FDS-2024: Fire Design Specification (FDS) for Wood Construction

Staff Analysis: A review of the standard proposed for inclusion in the code, ANSI/AWC FDS-2024 Fire Design Specification (FDS) for Wood Construction, with regard to some of the key ICC criteria for referenced standards (Section 4.6 of CP#28) will be posted on the ICC website on or before March 18, 2024.

Reason: A reference is added in Section 722.1 to the ANSI/AWC *2024 Fire Design Specification (FDS) for Wood Construction*, which includes provisions for fire design of wood members (both protected and unprotected), wood assemblies including calculation of structural fire resistance, thermal separation and burn-through prevention, and protection of connections that are not addressed in the AWC 2024 *National Design Specification (NDS) for Wood Construction* (ANSI/AWC NDS-2024).

The FDS was developed as an American National Standard through the AWC ANSI-approved consensus standards development process, and is available on the AWC website at the following location: https://awc.org/wp-content/uploads/2023/11/AWC_FDS2024_20231103_AWCWEBSITE.pdf

Bibliography: ANSI/AWC *2024 Fire Design Specification (FDS) for Wood Construction.* View this document online: https://awc.org/wp-content/uploads/2023/11/AWC_FDS2024_20231103_AWCWEBSITE.pdf

Cost Impact: Decrease

Estimated Immediate Cost Impact:

$0

Estimated Immediate Cost Impact Justification (methodology and variables):

The proposal provides a reference to the ANSI/AWC FDS, which contains provisions that provide acceptable means by which the fire design of wood members, assemblies and connections may be performed, while not precluding the use of other analysis methods. The inclusion of this additional option does not in and of itself increase or decrease the overall cost impact of the code, because this option may or may not be chosen. The existing options are still relevant, and if chosen, have no cost impact on the actual code requirements.

FS89-24

IBC: 722.1, 722.1.1 (New)

Proponents: Edward Lisinski, American Wood Council (elisinski@awc.org)

2024 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 procedure~~ Procedures found in Section 722.2 through Section 722.7 apply only to the information contained in ~~this~~ those ~~section~~ sections and shall not be otherwise used.
~~The calculated *fire resistance* of 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. ~~Steel assemblies shall be permitted in accordance with Chapter 5 of ASCE 29.~~
4. ~~Exposed wood members and wood decking shall be permitted in accordance with Chapter 16 of ANSI/AWC NDS.~~

Add new text as follows:

722.1.1 Reference standards.. The calculated *fire resistance* of specific materials or combinations of materials shall be in accordance with 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. Steel assemblies shall be permitted in accordance with Chapter 5 of ASCE 29.
4. Exposed wood members and wood decking shall be permitted in accordance with Chapter 16 of ANSI/AWC NDS.

Reason: The intent of this proposal is to clarify language without proposing any technical change.

Section 722.1 provides two separate options for calculated fire resistance, provisions of Sections 722.2 though Section 722.7 and reference standards, but they were always found in the same section. This created some confusion as to whether limitations of Section 722.2 though Section 722.7 applied to the reference standards.

Section 722.1 is revised to indicate calculations in Section 722.2 through Section 722.7 are limited to the information provided therein. This is done to remove an unintended interpretation that use of reference standards is also limited to only the information in Section 722.2 though Section 722.7. Additionally, the reference standards have been separated into a subsection to further clarify that they stand alone. Use of “in accordance with" replaces "established by” and is considered editorial.

Cost Impact: The change proposal is editorial in nature or a clarification and has no cost impact on the cost of construction

Justification for no cost impact:

The proposal clarifies existing requirements by adding language pointing directly to the applicable sections and breaking the reference standards into a separate subsection, to eliminate confusion.

FS90-24

IBC: 722.5, 722.5.1, 722.5.2, 722.5.3 (New), 722.5.4 (New), 722.5.5 (New), 722.5.6 (New)

Proponents: Bonnie Manley, AISC, AISC (manley@aisc.org); Jon-Paul Cardin, The CFSteel Group, The CFSteel Group (jp@cfsteelgroup.org)

2024 International Building Code

Revise as follows:

722.5 Steel assemblies and composite steel and concrete assemblies.
The provisions of this section contain procedures by which the *fire-resistance ratings* of steel assemblies and composite steel and concrete assemblies are established by calculations.

722.5.1 Structural steel columns.
The *fire-resistance ratings* of structural steel columns shall be based on the size of the element and the type of protection provided in accordance with this section.

722.5.2 Structural steel beams and girders.
The *fire-resistance ratings* of structural steel beams and girders shall be based on the size of the element and the type of protection provided in accordance with this section.

Add new text as follows:

722.5.3 Composite Structural Steel and Concrete Columns. The fire-resistance rating of structural steel columns acting compositely with concrete (filled or encased) shall be permitted to be based on the size of the composite member and concrete protection in accordance with AISC 360, Appendix 4, Section 4.3.2b.

722.5.4 Composite and Noncomposite Structural Steel I-shaped Beams and Girders. The fire-resistance rating of composite or noncomposite structural steel I-shaped beams and girders shall be permitted to be based on the size of the element and the type of protection provided in accordance with AISC 360, Appendix 4, Section 4.3.2c.

722.5.5 Concrete Floor Slabs on Steel Deck. The fire-resistance rating of composite concrete floor slabs on steel deck shall be permitted to be determined in accordance with AISC 360, Appendix 4, Section 4.3.2f.

722.5.6 Composite Plate Shear Walls. The fire-resistance rating for unprotected composite plate shear walls shall be permitted to be determined in accordance with AISC 360, Appendix 4, Section 4.3.2g.

Reason: This proposal is one of three that fully update Chapter 7 provisions of the IBC to reflect current structural steel industry standards. The 2024 edition of the IBC has already adopted the 2022 edition of AISC 360, *Specification for Structural Steel Buildings*, in Chapter 35 and elsewhere (Sections 722.5.2.2.1, 1604.3.3, 1705.2.1, 2202.1, and 2202.2.1.1). The purpose of this proposal is to recognize AISC 360's mandatory Appendix 4, Structural Design for Fire Conditions (specifically applicable portions of Appendix 4, Section 4.3), for calculating the fire resistance ratings of composite structural steel and concrete assemblies. Rather than extract these sections from AISC 360 and reprint them here, these new sections provide direct references to the applicable sections. The composite steel and concrete provisions are new for the 2022 edition of AISC 360.

AISC makes its standards available to all free of charge. AISC 360-22 can be downloaded for free from https://www.aisc.org/publications/steel-standards/. Please refer to the full AISC 360-22 commentary for technical background and guidance on applying the provisions.

Relevant extracts from the AISC-360 Commentary on Appendix 4, Section 4.3 summarize the technical basis for the requirements as follows:

Filled composite steel-concrete columns (Appendix 4, Section 4.3.2b(a)): “Research conducted at the National Research Council of Canada (Kodur and MacKinnon, 2000) has provided a basis for establishing an empirical equation to predict the standard fire resistance of filled round and square HSS for commonly used story heights and steel sections. This empirical equation was derived from and can only be used within the allowable range of design variables, as given, and is not applicable to lightweight concrete infill.”

Encased composite steel-concrete columns (Appendix 4, Section 4.3.2b(b)): “The fire-resistance ratings and requirements … were directly adapted from the ACI 216.1 (ACI, 2014) provisions for conventional steel bar reinforced concrete columns.”

Composite and noncomposite steel I-shaped beams and girders (Appendix 4, Section 4.3.2c): “The origins and example usage of this approach may be found in AISI (1984) … [and] is the result of an analysis of data from nine restrained beam specimens tested in accordance with ASTM E119 Standard UL 263 (ASTM, 2020d). The analysis is contained in UL Report NC505-11 (UL, 1984). Additional background and examples for this are provided in AISC Design Guide 19. This general equation is only applicable to sprayed fire resistance materials and not to intumescent or mastic coatings.”

Concrete floor slabs on steel deck (Appendix 4, Section 4.3.2f): “The development of …[provisions] for composite slabs with trapezoidal steel decking is described in Jiang et al. (2019)…[and]… is based on the thermal insulation criterion, which is specified as the time required for an average temperature rise of 284°F (140°C) or a maximum temperature rise of 356°F (180°C), whichever governs, to be reached at the unexposed surface of the slab when the slab is subjected to a standard fire from below. For this application, the steel deck is limited to trapezoidal profiles wherein the upper width of the deck rib is greater than or equal to the bottom width of the deck rib. … The finite element analyses were validated against experimental data from composite slabs tested under ASTM E119 fires. Jiang et al. (2019) show that the ... [provision] presents an improvement over the method provided in Annex D of Eurocode 4 (CEN, 2005d).”

Composite plate shear walls (Appendix 4, Section 4.3.2g): The provision “for determining the fire-resistance rating of composite plate shear walls is based on research conducted by Anvari et al. (2020b). The equation provides conservative failure times for walls subjected to standard ISO or ASTM fire scenarios. The equations are based on data obtained from experiments and benchmarked numerical models. The equation can be used for composite plate shear walls that meet the detailing and design requirements of Specification Chapter I, namely the steel plate slenderness and tie spacing requirements.”

Bibliography: AISC (2022), Specification for Structural Steel Buildings, ANSI/AISC 360-22, American Institute of Steel Construction, Chicago, Ill., August 1, 2022.

Available at: https://www.aisc.org/publications/steel-standards/.

Cost Impact: The change proposal is editorial in nature or a clarification and has no cost impact on the cost of construction

Justification for no cost impact:

This proposal clarifies the application of a standard already adopted in the 2024 IBC.

FS90-24

FS91-24

IBC: TABLE 722.7.1(1)

Proponents: Edward Lisinski, American Wood Council (elisinski@awc.org)

2024 International Building Code

Revise as follows:

TABLE 722.7.1(1) PROTECTION REQUIRED FROM NONCOMBUSTIBLE COVERING MATERIAL

REQUIRED FIRE-RESISTANCE RATING OF BUILDING ELEMENT PER TABLE 601 AND TABLE 705.5 (hours)	MINIMUM PROTECTION REQUIRED FROM NONCOMBUSTIBLE PROTECTION (minutes)
1	40
1-1/2	60
2	80
3 or more	120

Reason: Table 601 requires a 1-1/2 hour fire-resistance rating on roofs in Type IV-A buildings. However, that option was not originally provided in this table, nor was a footnote provided to the table permitting interpolation between rows. Because of that, there could be confusion as to how much non-combustible protection was required in these situations. The minimum non-combustible protection required in Table 722.7.1(1) is based on 2/3 of the required fire-resistance rating in Table 601 and Table 705.5.

Cost Impact: The change proposal is editorial in nature or a clarification and has no cost impact on the cost of construction

Justification for no cost impact:

This code proposal adds a row which prescribes a minimum noncombustible protection of 60 minutes for a 1-1/2 hour fire-resistance rated building element.

FS91-24

FS92-24

IBC: 803.1, 803.2 (New), 803.1.2, 803.2.1.1 (New), 803.2.1.1.1 (New), 803.2.1.1.2 (New), 803.2.1.2 (New), 803.5.2, 803.1.1, 803.1.1.1, 803.2.2.2 (New), 803.5.1, 803.5.1.1, 803.4, 803.14, 803.2, 803.3, 803.5, 803.6, 803.7, 803.8, 803.9, 803.10, 803.11, 803.12

Proponents: Paul Naprstek, PEN Architectural Consulting, PEN Architectural Consulting (info@pen-architecture.com)

2024 International Building Code

Revise as follows:

803.1 General.

Interior wall and ceiling finish materials shall be ~~classified~~ accepted as compliant for fire performance and smoke development in accordance with either Section ~~803.1.1~~ 803.2.2 or ~~803.1.2~~ 803.2.1 ~~,except as shown in Sections 803.1.3 through 803.15.~~ and installed in accordance with the criteria therein, as well as Sections 803.4 and 803.5 ~~Materials tested in accordance with Section 803.1.1 shall not be required to be tested in accordance with Section 803.1.2.~~

Exceptions:

1. Foam plastics shall not be used as *interior finish* except as provided i Section 2603.9. This section shall apply both to exposed foam plastics and to foam plastics used in conjunction with a textile or vinyl facing or cover.
2. Materials having a thickness less than 0.036 inch (0.9 mm) applied directly to the surface of walls or ceilings shall not be required to be tested.
3. Exposed portions of structural members complying with the requirements for buildings of Type IV construction in Section 602.4 shall not be subject to *interior finish* requirements.
4. Where used as interior wall finish materials, textile wall coverings, including materials having woven or nonwoven, napped, tufted, looped or similar surface and carpet and similar textile materials, shall be tested in the manner intended for use, using the product mounting system, including adhesive, and shall comply with the requirements of one of the following: Section 803.2.2, 803.2.3, or 803.2.1.3.
5. Where used as interior ceiling finish materials, textile ceiling coverings, including materials having woven or nonwoven, napped, tufted, looped or similar surface and carpet and similar textile materials, shall be tested in the manner intended for use, using the product mounting system, including adhesive, and shall comply with the requirements of Section 803.2.2 or 803.2.1.
6. Where used as interior wall finish materials, *expanded vinyl wall coverings* shall be tested in the manner intended for use, using the product mounting system, including adhesive, and shall comply with the requirements of one of the following: Section 803.2.2, 803.2.3, or 803.2.1.1.3.
7. Where used as interior ceiling finish materials, expanded vinyl ceiling coverings shall be tested in the manner intended for use, using the product mounting system, including adhesive, and shall comply with the requirements of Section 803.2.2 or 803.2.1.
8. Where high-density polyethylene or polypropylene is used as an *interior finish*, it shall comply with the requirements of Section 803.2.2.
9. Where used as interior wall or interior ceiling finish materials, *site-fabricated stretch systems* shall be tested in the manner intended for use, and shall comply with the requirements of Section 803.2.2 or 803.2.1. If the materials are tested in accordance with ASTM E 84 or UL 723, specimen preparation and mounting shall be in accordance with ASTM E 2573.
10. Laminated products factory-produced with a wood substrate shall comply with one of the following:
    - 10.1. The laminated product shall meet the acceptance criteria of Section 803.2.2 when tested in using the product mounting system, including adhesive, as described in Section 5.8 of NFPA 286.
    - 10.2. The laminated product shall meet the flame-spread criteria of Section 803.2.1.1.2 and the smoke-development criteria of Section 803.2.1.2. when tested -in accordance with ASTM E84 or UL 723. Test specimen preparation and mounting shall be in accordance with ASTM E2579.

11. Facings or veneers intended to be applied on site over a wood substrate shall comply with one of the following:
    11.1. The facing or veneer shall meet the criteria of 803.2.2 when tested in using the product mounting system, including adhesive, as described in Section 5.8 of NFPA 286.
    11.2. The laminated product shall meet the flame-spread criteria of Secton 803.2.1.1.2 and the smoke-development criteria of Section 803.2.1.2. when tested in accordance with ASTM E84 or UL 723. Test specimen preparation and mounting shall be in accordance with ASTM E2579.

Add new text as follows:

803.2 Interior wall, ceiling, and textile wall covering tests. Interior materials shall comply with criteria of Section 803.2.1, 803.2.2, or 803.2.3 in accordance with the limitations and exceptions set forth in Section 803.1.

Revise as follows:

~~**803.1.2**~~ **803.2.1 ASTM E84/UL 723 test of** ~~**Interior**~~ **interior wall and ceiling finish materials and textile wall coverings** ~~**tested in accordance with ASTM E84 or UL 723.**~~ *Interior wall* ~~and~~ or *ceiling finish* materials shall be ~~classified~~tested and assigned indices for flame spread and smoke development in accordance with ASTM E84 or UL 723. ~~Such *interior finish* materials shall be grouped in the following classes in accordance with their *flame spread* and *smoke-developed indices*.~~

~~Class A = *Flame spread index* 0–25; *smoke-developed index* 0–450.~~

~~Class B = *Flame spread index* 26–75; *smoke-developed index* 0–450.~~

~~Class C = *Flame spread index* 76–200; *smoke-developed index* 0–450.~~

~~**Exception:** Materials tested in accordance with Section 803.1.1 and as indicated in Sections 803.1.3 through 803.13.~~

Add new text as follows:

803.2.1.1 Interior flame-spread requirements for walls and ceilings. *Interior wall and ceiling finish* materials shall comply with 803.2.1.1.

803.2.1.1.1 Classification of flame spread indices. *Interior wall and ceiling finish* materials shall be grouped in the following flame spread classes in accordance with their flame spread index:

Class A: Flame spread index 0-25

Class B: Flame spread index 26-75

Class C: Flame spread index 76-200

803.2.1.1.2 Flame spread index requirements based on occupancy group. Interior wall and ceiling finish shall be of a flame spread class whose index is not greater than that for the class rating specified in Table 803.13 for the group and location designated.

803.2.1.2 Interior smoke development index requirements for walls and ceilings. *Interior wall and ceiling finish* materials with a smoke-developed index greater than 450 are prohibited.

Revise as follows:

~~**803.5.2**~~ **803.2.1.3 Acceptance criteria for textile and expanded vinyl wall or ceiling coverings tested to ASTM E84 or UL 723.** Textile wall and ceiling coverings and expanded vinyl wall and ceiling coverings shall have a Class A *flame spread index* in accordance with ~~ASTM E84 or UL 723~~ Section 803.2.1.1.1; shall meet the smoke-developed index requirements of 803.2.1.1.2; and shall be protected by an *automatic sprinkler system* installed in accordance with Section 903.3.1.1 or 903.3.1.2. Test specimen preparation and mounting shall be in accordance with ASTM E2404.

~~803.1.1~~ 803.2.2 NFPA 286 test of ~~Interior~~ interior wall and ceiling finish materials and textile wall coverings tested in accordance with NFPA 286.

Interior wall ~~and~~ or ceiling finish materials shall be ~~classified~~ tested in accordance with NFPA 286 and comply with Section 803.1.1.1. Materials complying with Section 803.1.1.1 shall be considered to also comply with the requirements of Class A.

~~803.1.1.1~~ 803.2.2.1 Acceptance criteria for NFPA 286.

The *interior finish* shall comply with the following:

1. During the 40 kW exposure, flames shall not spread to the ceiling.
2. The flame shall not spread to the outer extremity of the sample on any wall or ceiling throughout the entire test.
3. Flashover, as defined in NFPA 286, shall not occur throughout the entire test.
4. The peak ~~heat release~~ rate of heat release throughout the entire test shall not exceed 800 kW.
5. The total smoke released throughout the entire test shall not exceed 1,000 m^2.

Add new text as follows:

803.2.2.2 Interior flame-spread and smoke-developed requirements per NFPA 286. A material meeting the acceptance criteria of 803.1.1.1 shall be deemed to satisfy the requirements for a Class A, B, or C materials as required by Table 803.13.

Revise as follows:

~~803.5.1~~ 803.2.3 NFPA 265 ~~Room~~ room corner test for textile wall coverings and expanded vinyl wall coverings.

Textile wall coverings and *expanded vinyl wall coverings* shall meet the criteria of Section ~~803.5.1.1~~ 803.2.3.1 when tested in the manner intended for use in accordance with the Method B protocol of NFPA 265 using the product-mounting system, including adhesive.

~~803.5.1.1~~ 803.2.3.1 Acceptance criteria for NFPA 265.

The *interior finish* shall comply with the following:

1. During the 40 kW exposure, flames shall not spread to the ceiling.
2. The flame shall not spread to the outer extremities of the samples on the 8-foot by 12-foot ~~(203 by 305 mm)~~ (2438.4 mm by 3657.6 mm) walls.
3. Flashover, as defined in NFPA 265, shall not occur.
4. The total smoke release throughout the test shall not exceed 10,763.91 sf 1,000 m^2.

~~803.4 Foam plastics.~~

~~Foam plastics shall not be used as *interior finish* except as provided in Section 2603.9. This section shall apply both to exposed foam plastics and to foam plastics used in conjunction with a textile or vinyl facing or cover.~~

~~803.14~~ 803.3 Stability.

Interior finish materials regulated by this chapter shall be applied or otherwise fastened in such a manner that such materials will not readily become detached where subjected to room temperatures of 200°F (93°C) for not less than 30 minutes.

Delete without substitution:

~~803.2 Thickness exemption.~~

~~Materials having a thickness less than 0.036 inch (0.9 mm) applied directly to the surface of walls or ceilings shall not be required to be tested.~~

~~803.3 Heavy timber exemption.~~

Exposed portions of *building elements* complying with the requirements for *buildings* of heavy timber construction in Section 602.4 or Section 2304.11 shall not be subject to *interior finish* requirements except in *interior exit stairways*, interior exit *ramps*, and exit passageways.

803.5 Textile wall coverings.

Where used as interior wall finish materials, textile wall coverings, including materials having woven or nonwoven, napped, tufted, looped or similar surface and carpet and similar textile materials, shall be tested in the manner intended for use, using the product mounting system, including adhesive, and shall comply with the requirements of one of the following: Section 803.1.1, 803.5.1 or 803.5.2.

803.6 Textile ceiling coverings.

Where used as interior ceiling finish materials, textile ceiling coverings, including materials having woven or nonwoven, napped, tufted, looped or similar surface and carpet and similar textile materials, shall be tested in the manner intended for use, using the product mounting system, including adhesive, and shall comply with the requirements of Section 803.1.1 or 803.5.2.

803.7 Expanded vinyl wall coverings.

Where used as interior wall finish materials, *expanded vinyl wall coverings* shall be tested in the manner intended for use, using the product mounting system, including adhesive, and shall comply with the requirements of one of the following: Section 803.1.1, 803.5.1 or 803.5.2.

803.8 Expanded vinyl ceiling coverings.

Where used as interior ceiling finish materials, expanded vinyl ceiling coverings shall be tested in the manner intended for use, using the product mounting system, including adhesive, and shall comply with the requirements of Section 803.1.1 or 803.5.2.

803.9 High-density polyethylene (HDPE) and polypropylene (PP).

Where high-density polyethylene or polypropylene is used as an *interior finish*, it shall comply with Section 803.1.1.

803.10 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 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.

803.11 Laminated products factory produced with a wood substrate.

Laminated products factory produced with a wood substrate shall comply with one of the following:

1. The laminated product shall meet the criteria of Section 803.1.1.1 when tested in accordance with NFPA 286 using the product mounting system, including adhesive, as described in Section 5.8 of NFPA 286.
2. The laminated product shall have a Class A, B, or C *flame spread index* and *smoke-developed index*, based on the requirements of Table 803.13, in accordance with ASTM E84 or UL 723. Test specimen preparation and mounting shall be in accordance with ASTM E2579.

803.12 Facings or wood veneers intended to be applied on site over a wood substrate.

Facings or *veneers* intended to be applied on site over a wood substrate shall comply with one of the following:

~~1. The facing or *veneer* shall meet the criteria of Section 803.1.1.1 when tested in accordance with NFPA 286 using the product mounting system, including adhesive, as described in Section 5.9 of NFPA 286.~~

~~2. The facing or *veneer* shall have a Class A, B or C *flame spread index* and *smoke-developed index*, based on the requirements of Table 803.13, in accordance with ASTM E84 or UL 723. Test specimen preparation and mounting shall be in accordance with ASTM E2404.~~

Attached Files

- **Final-Proposed revision to 2027 IBC Section 803 (4).doc**
  https://www.cdpaccess.com/proposal/10623/30738/files/download/4756/

Reason: Since major revisions were made to Section 803 in the 2009 IBC, this section has proven to be nearly unreadable—a maze of overlapping and seemingly contradictory requirements and exceptions that tries any reader's ability to understand its requirements and options. As a member of the Technical Committee on Fire Protection for the development of the 2014 New York City Building Code (based on the 2009 IBC) I was tasked with re-arranging the content of this section to make it easier to understand. This proposed revision is based on that edit (which appeared in the 2014 BCNYC), modified to incorporate changes that have been made to the five editions of the IBC which have followed.

None of the content of this section has been altered. This is strictly an editorial revision.

Each of the various subsections of IBC 803 (2024 edition) fits into one of the following categories:

a. Citations to incorporate four referenced standards, and the tests (four in total) for flame spread and smoke development that they describe, into the Code. (The four referenced standards are NFPA 286, ASTM E84, UL 723, and NFPA 265.)

b. Acceptance criteria for materials based on their performance in one of the above-cited tests.

c. In the case of ASTM E84 and UL 723 only, a further classification of materials based on their numerical indices for flame spread obtained when they are tested per the referenced standard.

d. Text indicating which of the tests are acceptable for use based on the properties of the material concerned.

e. Text indicating the applicability of certain flame-spread classifications based on the occupancy (use) of the space involved.

f. Exemptions from testing for certain materials based on their thickness.

g. A prohibition on the use of one material (803.4, "Foam plastics").

h. A section regarding the manner of installation of certain materials (803.14, "Stability.")

However, as published, these sections are all mixed up:

a. Three of the tests are incorporated by adjacent sections (803.1.1 and 803.1.2), but the fourth is buried several paragraphs later (at 803.5.1).

b. Acceptance criteria for these various tests is similarly scattered (see 803.1.1.1, 803.5.1.1, 803.5.1.2).

c. No application or purpose is provided for the classification system imposed on ASTM E84 and UL 723 (at 803.1.2) until we reach Section 803.13.

d. The exemptions based on thickness (803.2, 803.3) are buried between two of the test citations and the requirements based on material qualities.

My re-arrangement of the section's content proposes that the material be simply presented in the following order:

a. Presentation of the basic requirement (803.1) for all materials not otherwise covered in this sections Exceptions.

b. Exemptions to this requirement, presented as Exceptions 1 and 2.

c. Specific requirements based on a material's property, presented as Exceptions 3-10.

d. Citation of each of all four the four test standards in three sections (ASTM E84 and UL 723 share the same criteria and so continue to be listed in the same section).

e. Acceptance criteria for each respective test. For ASTM E84 and UL 723 this incorporates the classification system and the flame spread index requirements based on occupancy.

f. Prohibition of one material (foam plastics). Alternatively, this could be presented as another Exception to 803.1.

g. The "Stability" section, which is the one paragraph dealing specifically with execution.

This organization is much more user friendly because it permits the user to (a) determine which tests are acceptable for the material in question, (b) read the citation describing the test standard selected, and (c) determine the acceptance criteria based on the selected standard, material, and room occupancy, all in the order that the material is presented.

Below are some other things I find problematic with the text as currently published, and how I propose to improve it:

1. Section 803 cites four (4) different tests for flame spread and smoke development: NFPA 286, ASTM E84, UL 723, and NFPA 265. However, NFPA 265 is an acceptable test only for textile wall coverings or expanded vinyl wall coverings. NFPA 286 is the only acceptable standard for HDPE and PP wall or ceiling coverings.ASTM E84 and UL 723 may be used for textile or vinyl wall or ceiling coverings, but using different acceptance criteria than that used for site-fabricated stretch systems, laminate products with a wood substrate, or site-applied facings on a wood substrate. These requirements have a mix-and-match quality that current presentation makes even more confusing.

2. Section 803 opens by stating that "interior wall and ceiling finish materials shall be classified [emphasis added] in accordance with Section 803.1.1 or 803.1.2 (i.e., NFPA 286, ASTM E84, or UL 723). However, both of the sections cited refer to referenced standards for testing, not classifying, interior materials. The classification process is a grouping imposed by the IBC itself, in Section 803.1.2, based on the flame spread indices obtained when materials are tested in accordance with ASTM E84 or UL 723 only (i.e., the referenced standards cited in 803.1.2), which make no reference to these three "classes" in their own text.

The third standard, NFPA 286, has no classification function at all. It is a "pass-fail" test based on the criteria listed in IBC 803.1.1.1. (A note in 803.1.1 states that any material that meets the criteria in 803.1.1.1 is granted a "Class A" classification by fiat; otherwise the material is not permitted for use—there is no "Class B" or "Class C" when using NFPA 286. (By definition, a "classification" system must have more than one class.) Mis-use of the term "classified" for "tested" continues in Sections 803.1.1 and 803.1.2.3.

3. While the three classes assigned to ASTM E84 or UL 723 are based on different ranges of flame-spread indices, all three have the same acceptable range of smoke-developed indices (0-450). In other words, this is a distinction without a difference. Moreover, there is no instance where a product with a smoke-developed index above 450 is permitted for interior use. Therefore I have simplified this requirement by simply stating (at my 803.2.1.2) that "interior wall and ceiling finish materials with a smoke-developed index greater than 450 are prohibited. Isn't that what we are really trying to say?

All in all, I believe that this re-arrangement will greatly improve compliance by making the requirements for compliance less inscrutable.

Cost Impact: The change proposal is editorial in nature or a clarification and has no cost impact on the cost of construction

Justification for no cost impact:

Editorial change, with no revision to code content.

FS92-24

FS93-24

IBC: 803.13

Proponents: Marcelo Hirschler, GBH International, GBH International (mmh@gbhint.com)

2024 International Building Code

Revise as follows:

803.13 Interior finish requirements based on occupancy.
Interior wall and ceiling finish shall have a classification such that the *flame spread index* and *smoke-developed index* values are not higher than those corresponding to the classification specified in Table 803.13 for the group and location designated. *Interior wall and ceiling finish* materials tested in accordance with NFPA 286 and meeting the acceptance criteria of Section 803.1.1.1, shall be permitted to be used where a Class A , B, or C classification in accordance with ASTM E84 or UL 723 is required.

Reason: There have been cases where it has been questioned whether a report detailing compliance with the requirements of NFPA 286 in Section 803.1.1.1 is acceptable only when the requirements are for a Class A in accordance with ASTM E84. It should be clear (but is not explicit) that complying with 803.1.1.1 exempts from the requirement for testing any place where there is a requirement for a Class A, a Class B, or a Class C in accordance with ASTM E84. This proposal is simply clarification.

Cost Impact: The change proposal is editorial in nature or a clarification and has no cost impact on the cost of construction

Justification for no cost impact:

Simple clarification.

FS94-24

IBC: 803.13, TABLE 803.13

Proponents: Jeff Grove, Chair, Building Code Action Committee (BCAC) (bcac@iccsafe.org)

2024 International Building Code

803.13 Interior finish requirements based on occupancy.

Interior wall and ceiling finish shall have a classification such that the *flame spread index* and *smoke-developed index* values are not higher than those corresponding to the classification specified in Table 803.13 for the group and location designated. *Interior wall and ceiling finish* materials tested in accordance with NFPA 286 and meeting the acceptance criteria of Section 803.1.1.1, shall be permitted to be used where a Class A classification in accordance with ASTM E84 or UL 723 is required.

Revise as follows:

TABLE 803.13 INTERIOR WALL AND CEILING FINISH REQUIREMENTS BY OCCUPANCY[k]

	SPRINKLERED[f] S, S13R, S13D			NONSPRINKLERED - NS		
GROUP	Interior exit stairways and ramps and exit passageways[a, b]	Corridors and enclosure for exit access stairways and ramps	Rooms and enclosed spaces[c]	Interior exit stairways and ramps and exit passageways[a, b]	Corridors and enclosure for exit access stairways and ramps	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[l,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.

NS = Buildings not equipped throughout with an automatic sprinkler system; S = Buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1; S13R = Buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.2; S13D = Buildings equipped throughout with an automatic sprinkler system installed in accordance with Sections 903.2.8 and 903.3.1.3.

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.~~

l~~m~~. Corridors in ambulatory care facilities shall be provided with Class A or B materials.

Reason: The intent of this group of proposal is to make the tables in Chapter 8 and 10 consistent with the revisions to Table 504.3, 504.4, 506.2 – using S13, S13R, S13D and NP for sprinkler requirements. This would clarify what happens when an NFPA 13D sprinkler system is used. This is not intent to change current allowances; just to clarify what requirements are applicable for an NFPA13D system.

Discussion during the BCAC calls has indicated that it is needed to identifying specific code sections so that everyone has the same understanding.

Group R-4 requirements do not always have to be stated as Section 310.5 states “Group R-4 occupancies shall meet the requirements for construction as defined for Group R-3, except as otherwise provided for in this code.” However, since a lot of people miss that, we are including R-4 in the proposed applicable footnotes.

Townhouses are defined as attached dwelling units that extend from foundation to grade and are open on at least two sides. If a townhouse is 3 stories or less, it can choose to comply with the IBC or IRC (Section 101.2). The IRC Section P2904 is similar to an NFPA 13D system. If the IBC is used, townhouses subdivided by firewalls into 1 or 2 units per building is a Group R-3 (Section 310.4) and townhouses subdivided by fire partitions (Section 420.2) are a Group R-2 (Section 310.3). This is important to clarify because all townhouses can use a 13D sprinkler system: Section 903.2.8 references 903.3, and 903.1.3.3 specifically stating that “Automatic sprinkler systems installed in … and townhouses shall be permitted to be installed throughout in accordance with NFPA 13D.” To make this obvious in the tables, a reference to 903.2.8 and 903.1.3.3 are added in the footnote.

Specifics for this change –

· adds the S13, S13R, S13D and NS in the table titles and footnotes with the section references for sprinklers.· Footnote l with the sprinkler reference is redundant and deleted.

This proposal is submitted by the ICC Building Code Action Committee (BCAC).
BCAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2023 the BCAC has held several virtual meetings open to any interested party. In addition, there were numerous virtual Working Group meetings for the current code development cycle, which included members of the committee as well as interested parties. Related documents and reports are posted on the BCAC website at BCAC webpage.

Cost Impact: The change proposal is editorial in nature or a clarification and has no cost impact on the cost of construction

Justification for no cost impact:

This is a clarification of requirements for Group R where an NFPA13D system is permitted. There are no changes to construction requirements.

FS94-24

FS95-24

IBC: 804.2

Proponents: Tim Earl, GBH International, Self (tearl@gbhint.com)

2024 International Building Code

Revise as follows:

804.2 Classification.

Interior floor finish and floor covering materials required by Section 804.4.2 to be of Class I or II materials shall be tested to ~~classified in accordance with~~ ASTM E648 or NFPA 253. Such materials shall be grouped in the following classes in accordance with their critical radiant flux. ~~The classification referred to herein corresponds to the classifications determined by ASTM E648 or NFPA 253 as follows: Class I, 0.45 watts/cm^2 or greater; Class II, 0.22 watts/cm^2 or greater.~~

Class I = Critical radiant flux 0.45 watts/cm^2 or greater.

Class II = Critical radiant flux 0.22-0.44 watts/cm^2

Reason: This is just a simple reformat to a more readable format.

Cost Impact: The change proposal is editorial in nature or a clarification and has no cost impact on the cost of construction

Justification for no cost impact:

No technical change. No cost impact.

FS96-24

IBC: [F] 806.2

Proponents: Jeffrey Grove, Southern Nevada ICC Chapter (jeff.grove@coffman.com)

THIS CODE CHANGE WILL BE HEARD BY THE FIRE CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THESE COMMITTEE.

2024 International Building Code

Revise as follows:

[F] 806.2 Combustible decorative materials.
In Groups A, B, E, I, M and R-1 and in *dormitories* in Group R-2, curtains, draperies, fabric hangings and similar combustible *decorative materials* suspended from walls or ceilings shall comply with Section 806.4 ~~and shall not exceed~~ . Where exceeding 10 percent of the specific wall or ceiling area to which such materials are attached~~.~~, they shall comply with Section 803.
Fixed or movable walls and partitions, paneling, wall pads and crash pads applied structurally or for decoration, acoustical correction, surface insulation or other purposes shall be considered to be *interior finish*, shall comply with Section 803 and shall not be considered to be *decorative materials* or furnishings.

Exceptions:

1. In auditoriums in Group A, the permissible amount of curtains, draperies, fabric hangings and similar combustible *decorative materials* suspended from walls or ceilings shall not exceed 75 percent of the aggregate wall area where the *building* is equipped throughout with an *approved automatic sprinkler system* in accordance with Section 903.3.1.1, and where the material is installed in accordance with Section 803.15 of this code.
2. In Group R-2 *dormitories*, within *sleeping units* and *dwelling units*, the permissible amount of curtains, draperies, fabric hangings and similar *decorative materials* suspended from walls or ceiling shall not exceed 50 percent of the aggregate wall areas where the *building* is equipped throughout with an *approved automatic sprinkler system* installed in accordance with Section 903.3.1.
3. In Group B and M occupancies, the amount of combustible *fabric partitions* suspended from the ceiling and not supported by the floor shall comply with Section 806.4 and shall not be limited.
4. The 10-percent limit shall not apply to curtains, draperies, fabric hangings and similar combustible *decorative materials* used as window coverings.

Reason: This code change is proposing to add language to clarify that, when exceeding the 10 percent area threshold, combustible decorative materials shall be permitted, so long as they comply with Section 803 provisions for wall and ceiling finishes.

Cost Impact: The change proposal is editorial in nature or a clarification and has no cost impact on the cost of construction

Justification for no cost impact:

The code change proposal will not increase or decrease the cost of construction. This code change proposal is to clarify the permitted use of combustible decorative material in excess of 10 percent of the specific wall or ceiling area to which such materials are attached.

FS97-24

IBC: [F] 806.2

Proponents: Jeffrey Grove, Southern Nevada ICC Chapter (jeff.grove@coffman.com)

THIS CODE CHANGE WILL BE HEARD BY THE FIRE CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THESE COMMITTEE.

2024 International Building Code

Revise as follows:

[F] 806.2 Textiles, Fabrics and combustible ~~Combustible~~ decorative materials.
In Groups A, B, E, I, M and R-1 and in *dormitories* in Group R-2, textiles and fabrics such as curtains, draperies, fabric hangings and similar combustible *decorative materials* suspended from walls or ceilings shall comply with Section 806.4 and shall not exceed 10 percent of the specific wall or ceiling area to which such materials are attached.
Fixed or movable walls and partitions, paneling, wall pads and crash pads applied structurally or for decoration, acoustical correction, surface insulation or other purposes shall be considered to be *interior finish*, shall comply with Section 803 and shall not be considered to be *decorative materials* or furnishings.

Exceptions:

1. ~~In auditoriums in Group A, the~~ The permissible amount of curtains, draperies, and fabric hangings, and combustible fabric partitions ~~and similar combustible *decorative materials*~~ suspended from walls or ceilings and not supported by the floor, shall not be limited ~~exceed 75 percent of the aggregate wall area~~ where the *building* is equipped throughout with an *approved automatic sprinkler system* in accordance with Section 903.3.1.1, and where the material is installed in accordance with Section 806.4 ~~803.15~~ of this code.
2. The permissible amount of combustible decorative materials shall not exceed 75 percent of the aggregate wall area where the building is equipped throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.1, and where the material is installed in accordance with Section 803.15 of this code.
3. ~~2.~~3. In Group R-2 *dormitories*, within *sleeping units* and *dwelling units*, the permissible amount of curtains, draperies, fabric hangings and similar *decorative materials* suspended from walls or ceiling shall not exceed 50 percent of the aggregate wall areas where the *building* is equipped throughout with an *approved automatic sprinkler system* installed in accordance with Section 903.3.1.
4. ~~3.~~4. In Group B and M occupancies, the amount of combustible *fabric partitions* suspended from the ceiling and not supported by the floor shall comply with Section 806.4 and shall not be limited.
5. ~~4.~~5. The 10-percent limit shall not apply to curtains, draperies, fabric hangings and similar combustible *decorative materials* used as window coverings.

Reason: The tendency for an initial ignition of the materials covered by the exception is reduced by their required compliance with the Standard Methods of Fire Tests for Flame-propagation of Textile Films, NFPA 701-23. Automatic sprinklers are effective in extinguishing these materials.

The code section covers several types of combustible and therefore the words “textiles and fabrics” as used in the Standard Methods of Fire Tests for Flame-propagation of Textiles and Films, NFPA 701 are added to the heading to address these types of materials. Some of the materials regulated will be textiles and fabrics as well as combustible decorative elements materials.

Limiting the allowable amount of textiles and fabrics to Group A auditoriums is inconsistent with the relative risk as compared to all other occupancies. Fire loss data associated with curtains, draperies, fabric hangings and similar combustible decorative materials are not apparent or forthcoming. The 10 percent limitation is not readily enforceable and is a needless hardship to the exhibit and tradeshow industry.

Hanging materials such as curtains and draperies are much different than combustible decorative materials and therefore it is proposed that they be addressed in a separate exception. Thus, exception 1 addressed these separately.

Decorative materials are much different than hanging fabric as they can include elements that are not flat, thinner materials and in different geometries and often plastic.

Exception 4 addresses the case where the building is not sprinklered. It allows for changing rooms and other small booths.

Exception 5 retains the current allowance for window treatments.

Cost Impact: The change proposal is editorial in nature or a clarification and has no cost impact on the cost of construction

Justification for no cost impact:

Code change proposal will not increase the cost of construction as it clarifies the amount of materials textiles, fabrics and combustible materials that can be reasonably utilized.

FS97-24

FS98-24

IBC: 1402.2, 1402.3 (New), [BS] 1402.3, FIGURE 1402.3 (New), TABLE 1402.3 (New)

Proponents: Jay Crandell, P.E., ABTG / ARES Consulting, myself (jcrandell@aresconsulting.biz); Art DeGaetano, Northeast Regional Climate Center, Cornell, self (atd2@cornell.edu)

2024 International Building Code

Revise as follows:

1402.2 Weather protection.
Buildings shall be provided with a weather-resistant *exterior wall assembly* . The *exterior wall assembly* shall include flashing, as described in Section 1404.4. The *exterior wall assembly* shall be designed and constructed in such a manner as to prevent the accumulation of water within the exterior 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. Where not otherwise addressed by the materials and methods for weather protection prescribed by this code, rainwater resistance shall be permitted to be demonstrated in accordance with Section 1402.3. Protection against condensation in the *exterior wall* assembly shall be provided in accordance with Section 1404.3.

Exceptions:

1. A weather-resistant *exterior wall assembly* 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 assembly* 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:
   The *exterior wall* design shall be considered to resist wind-driven rain where the results of testing, in accordance with ASTM E331, indicate that water did not penetrate control joints in the *exterior wall* , joints at the perimeter of openings or intersections of terminations with dissimilar materials.
   2.1. *Exterior wall* 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* test assemblies shall be not less than 4 feet by 8 feet (1219 mm by 2438 mm) in size.
   2.3. *Exterior wall* test assemblies shall be tested at a minimum differential pressure of 6.24 pounds per square foot (0.297 kN/m^2).
   2.4. *Exterior wall* test assemblies shall be subjected to a minimum test exposure duration of 2 hours.
3. *Exterior insulation and finish systems* (EIFS) complying with Section 1407.4.1.

Add new text as follows:

1402.3 Rainwater resistance.. The rainwater resistance of *exterior wall* assemblies, including the *exterior wall covering* assembly or only the *water-resistive barrier* system, shall be permitted to be tested in accordance with ASTM E331 to demonstrate compliance with the weather protection requirements of Section 1402.2. The following test conditions shall apply:

1. The ASTM E331 test pressure shall be determined in accordance with Table 1402.3 and Figure 1402.3 or by calculations in accordance with ASCE 7 using a design wind-driven rain wind speed in accordance with Figure 1402.3. The test pressure shall not be less than 2.86 psf (137 Pa) and shall not be required to exceed 12.0 psf (575 Pa).
2. The duration of test shall not be less than 15 minutes. Subsequent tests with increased test pressure shall be permitted with leakage assessment after each test.
3. The tested assembly shall be considered to resist wind-driven rain at the greatest test pressure increment where water did not penetrate the innermost layer intended to provide water resistance protection of the remainder of the wall assembly.

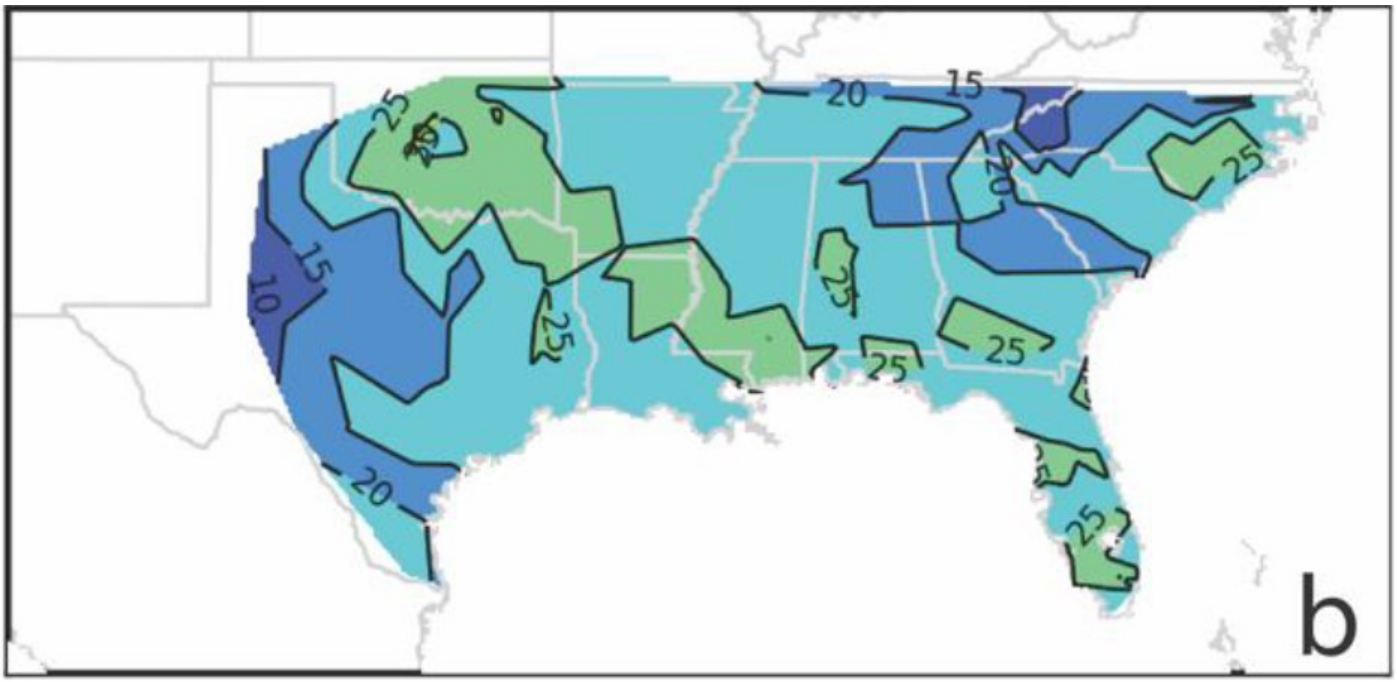
4. Test assemblies shall be constructed in accordance with the applicable manufacturer's installation instructions for each component and shall comply with the following minimum assembly configuration requirements:
   4.1. Not fewer than one opening element or blank, and flashing condition.
   4.2. Not fewer than one vertical and horizontal joint in the *water-resistive barrier* assembly where representative of installed conditions
   4.3. Where exterior *veneer* or cladding is included on the test assembly, it shall include not fewer than one control joint or transition joint as applicable and the results shall be limited to the type of *veneer* or cladding used.
   4.4. Test assemblies shall not be less than 4 feet by 8 feet (1.2 m by 2.4 m) in size.

Revise as follows:

[BS] 1402.4 ~~1402.3~~ Wind resistance.

Exterior walls, exterior wall coverings, exterior soffits and fascias, and the associated openings, shall be designed and constructed to resist safely the superimposed *loads* required by Chapter 16.

Add new text as follows:



Source: Cornell University / NOAA - ***to be replaced with full U.S. map with smoothed wind speed contours and units of MPH instead of m/s.***

FIGURE 1402.3 Wind-driven rain wind speed (m/s) hazard map to determine ASTM E331 test pressure criteria [1 m/s = 2.24 mph]

TABLE 1402.3 Pre-calculated Wind-Driven Rain ASTM E331 Test Pressure (PSF)

Wind Exposure	Mean Roof Height (ft)	Wind-driven Rain Wind Speed, m/s (MPH)						
		10	15	20	25	30	35	40
		(22.4)	(33.6)	(44.8)	(56.0)	(67.2)	(78.4)	(89.6)

B	15	2.86	2.86	3.46	5.40	7.78	10.6	12.0
	20	2.86	2.86	3.76	5.87	8.46	11.5	12.0
	25	2.86	2.86	4.00	6.25	9.00	12.0	12.0
	30	2.86	2.86	4.24	6.63	9.55	12.0	12.0
	40	2.86	2.86	4.61	7.20	10.4	12.0	12.0
	50	2.86	2.86	4.91	7.67	11.0	12.0	12.0
	60	2.86	2.90	5.15	8.05	11.6	12.0	12.0
C	15	2.86	2.90	5.15	8.05	11.6	12.0	12.0
	20	2.86	3.07	5.46	8.53	12.0	12.0	12.0
	25	2.86	3.21	5.70	8.90	12.0	12.0	12.0
	30	2.86	3.34	5.94	9.28	12.0	12.0	12.0
	40	2.86	3.55	6.31	9.85	12.0	12.0	12.0
	50	2.86	3.72	6.61	10.3	12.0	12.0	12.0
	60	2.86	3.85	6.85	10.7	12.0	12.0	12.0
D	15	2.86	3.51	6.24	9.8	12.0	12.0	12.0
	20	2.86	3.68	6.55	10.2	12.0	12.0	12.0
	25	2.86	3.82	6.79	10.6	12.0	12.0	12.0
	30	2.86	3.96	7.03	11.0	12.0	12.0	12.0
	40	2.86	4.16	7.40	11.6	12.0	12.0	12.0
	50	2.86	4.33	7.70	12.0	12.0	12.0	12.0
	60	2.86	4.47	7.94	12.0	12.0	12.0	12.0

For SI: 1 psf = 47.9 Pa

Reason: The code lacks a risk-consistent basis for addressing wind-driven rain and resistance to water intrusion. This proposal provides a wind-driven rain hazard map (Figure 1402.3) that properly characterizes the hazard as it varies across wind-driven rain climatology of the U.S. This map of the southeastern U.S. is a placeholder until a map of the entire U.S. becomes available in 2024.

The proposal "permits" and does not mandate use of proposed Section 1402.3, the wind-driven rain map of Figure 1402.3, or the associated ASTM E331 test pressures of Table 1402.3. Instead, the reference to Section 1402.3 in Section 1402.2 uses permissive language ("shall be permitted") to allow for current practice to continue unchanged for existing materials and methods recognized in the code. This optional or voluntary approach will allow time for various stake-holders and standards developers to align their standards with this new risk-based approach without changing requirements for materials and methods currently recognized in the code at this time.

Various portions and details of this proposal are further explained below.

Figure 1402.3

– As reported in the Bibliography reference, the climatology of wind-driven rain is developed from recently available 1-min weather observations from National Weather Service Automated Surface Observing Systems (ASOS). One-minute data better represent the joint occurrence of the extremes that define wind-driven rain occurrence than hourly data, which previously was the shortest available temporal resolution. After adjusting the winds speeds to standardize for exposure and anemometer type, the wind data corresponding to specific rainfall thresholds were fit to a statistical distribution to obtain estimates of the recurrence of wind speeds associated with different rainfall intensities. The values serve as the basis for a wind-driven rain climatology for the United States that is analogous to climatologies that exist and inform building codes in Europe and Canada. The wind-driven rain map shown in Figure 1402.3 is based on the currently completed research for the southeastern U.S. and represents a 3-sec gust wind speed (meters per second) for a 10-yr mean recurrence interval with a threshold coincidental rainfall rate of 2.54 mm/min (see JAMC article referenced in Bibliography). It is anticipated that research to complete a similar map for the entire U.S. (at an appropriate return period wind speed and threshold for coincidental rainfall rate) will be completed prior to the second committee hearing in 2024.

Section 1402.3 & Table 1402.3

– The test procedure and requirements used in proposed new Section 1402.3 rely on a standard test method commonly used for assessing wind-driven rain resistance, ASTM E331. While similar to testing requirements in Exception 2 of Section 1402.2, the application of Section 1402.3 is not limited to evaluation of "barrier claddings" that lack a means of drainage. The main purpose of the mapped wind-driven rain hazard (Figure 1402.3) is to provide a wind-driven rain wind speed from which an appropriate, risk-consistent test pressure can be used to evaluate the water-resistance of wall assemblies and exterior wall covering assemblies or components using ASTM E331. The test pressure may be determined in two ways. One way is to use the prescriptive (pre-calculated) test pressures in Table 1402.3. The other way is to calculate the test pressure using the ASCE 7 provisions for wind loads, but substituting the appropriate wind-driven rain wind speed from Figure 1402.3 for the basic wind speed used for structural design purposes in ASCE 7. The latter method was how Table 1402.3 was generated. An example of calculating the test pressure using Figure 1402.3 and the wind load provisions of ASCE 7 is as follows:

Wind-driven rain wind speed: 44.8 mph (20 m/s – Figure 1402.3)

Wind Exposure: B (suburban/wooded)

Building Height: 30 feet

Wall Pressure coefficients – GCp = 1.0 (positive); GCpi = -0.18 (negative internal pressure)

Kz = 0.7 (exposure B, 30' height)

Kd = 1.0 (directionality not considered)

Kzt = 1.0 (no topographic wind speed up effects considered)

Ke = 1.0 (no elevation effects considered w/r to lower density of air at higher elevations)

$p = [0.00256\ Kz\ Kzt\ Kd\ Ke\ V^2] \times [GCp - GCpi]$

$= 0.00256(0.7)(1.0)(1.0)(1.0)(44.8)^2 \times [1.0 + 0.18]$

= (3.6 psf) x [1.18] = **4.24 psf** test pressure

The above calculation method was used to develop Table 1402.3 as shown also in the table below. This table is provided for transparency and informational purposes.

	Mean			WDR Wind Speed, m/s (MPH)							
Wind	Roof	10	15	20	25	30	35	40	45	50	60
Exposure	Height (ft)	22.4	33.6	44.8	56	67.2	78.4	89.6	100.8	112	134.4
	15	0.86	1.94	3.46	5.40	7.78	10.58	13.82	17.50	21.60	31.10
	20	0.94	2.11	3.76	5.87	8.46	11.51	15.04	19.03	23.49	33.83
	25	1.00	2.25	4.00	6.25	9.00	12.25	16.01	20.26	25.01	36.01
B	30	1.06	2.39	4.24	6.63	9.55	13.00	16.98	21.49	26.53	38.20
	40	1.15	2.59	4.61	7.20	10.37	14.11	18.43	23.33	28.80	41.47
	50	1.23	2.76	4.91	7.67	11.05	15.04	19.64	24.86	30.69	44.20
	60	1.29	2.90	5.15	8.05	11.60	15.78	20.61	26.09	32.21	46.38
	15	1.29	2.90	5.15	8.05	11.60	15.78	20.61	26.09	32.21	46.38
	20	1.36	3.07	5.46	8.53	12.28	16.71	21.83	27.62	34.10	49.11
	25	1.42	3.21	5.70	8.90	12.82	17.45	22.80	28.85	35.62	51.29
C	30	1.49	3.34	5.94	9.28	13.37	18.20	23.77	30.08	37.14	53.47
	40	1.58	3.55	6.31	9.85	14.19	19.31	25.22	31.92	39.41	56.75
	50	1.65	3.72	6.61	10.33	14.87	20.24	26.43	33.46	41.30	59.48
	60	1.71	3.85	6.85	10.70	15.41	20.98	27.40	34.68	42.82	61.66
	15	1.56	3.51	6.24	9.76	14.05	19.12	24.98	31.61	39.03	56.20
	20	1.64	3.68	6.55	10.23	14.73	20.05	26.19	33.15	40.92	58.93
	25	1.70	3.82	6.79	10.61	15.28	20.80	27.16	34.38	42.44	61.11
D	30	1.76	3.96	7.03	10.99	15.82	21.54	28.13	35.60	43.96	63.30
	40	1.85	4.16	7.40	11.56	16.64	22.65	29.59	37.45	46.23	66.57
	50	1.92	4.33	7.70	12.03	17.32	23.58	30.80	38.98	48.12	69.30
	60	1.99	4.47	7.94	12.41	17.87	24.32	31.77	40.21	49.64	71.48

It is important to note that the failure mode that this proposal addresses is the initiation of a leak (water intrusion) at a specified extreme event level. Therefore, it provides protection for routine and lesser extreme events that have equal or lower wind-driven rain wind speed (even if the rainfall rate is substantially greater than the threshold used to develop Figure 1402.3). Events that exceed the wind-driven rain wind speed and given recurrence interval (return period or annual extreme probability) tend to have lower coincidental rainfall rates

as based on the natural tendency in the climatological data (see JAMC article referenced in Bibliography).

Finally, as indicated in Section 1402.3 (Item 1) and shown in Table 1402.3, the lower limit of 2.86 psf (137 Pa) for test pressure is used to correspond with the minimum test pressure specified in ASTM E331 (despite the table above showing that lower pressure could be justified in regions of low wind-driven rain hazard). The upper limit of 12.0 psf (575 Pa) in Table 1402.3 also is based on current accepted practice for worst-case wind-driven rain climate conditions in the U.S. and ensures the availability of solutions (it also ensures equivalency with current accepted practices for regions or conditions considered to have high wind-driven rain hazard). These limits ensure that this new approach is "calibrated" to accepted practice and that solutions are available while also better aligning solutions with actual variation in U.S. wind-driven rain hazard. Even so, the 12 psf cap will provide substantial protection against significant water-intrusion and contents damage in greater wind-driven rain hazard conditions or events (higher wind speed at greater return periods) up to the point where structural failures begin to occur and the general integrity of the building envelope is compromised. Such extreme structural safety-level events are beyond the scope of a serviceability concern underlying the current and proposed approach to water resistance. Regardless, the proposed approach deals with the matter of wind-driven rain water resistance in a much more risk-consistent fashion based on the variation in hazard across the U.S. (wind-driven rain wind speed) and for different building conditions (e.g., wind exposure and building height).

Bibliography: Belcher, B.N., DeGaetano, A.T., Masters, F.J., Crandell, J., and Morrison, M.J. (2023). Development of an Extreme Wind-Driven Rain Climatology for the Southeastern United States Using 1-Min Rainfall and Peak Wind Speed Data. *Journal of Applied Meteorology and Climatology*, American Meteorological Society, DOI: https://doi.org/10.1175/JAMC-D-22-0156.1

Cost Impact: Decrease

Estimated Immediate Cost Impact:

$0.00

While the cost impact indicates "increased cost" (there was no suitable default answer in cdpACCESS), the proposal does not mandate any new requirements. It provides a new means or option to evaluate building wall assemblies and components for water resistance using an improved methodology based on actual wind-driven rain hazard. If voluntarily used, it could result in an increase or decrease cost for material or assembly qualification purposes relative to existing practices. But, the increase or decrease in cost to the end user may be very small. This proposal also does not require any existing materials or methods recognized in the code to alter current requirements, methods, or standards. So, it should be considered cost neutral.

Estimated Immediate Cost Impact Justification (methodology and variables):

Zero

Estimated Life Cycle Cost Impact:

Zero

Estimated Life Cycle Cost Impact Justification (methodology and variables):

See cost impact statement.

FS98-24

FS99-24

IBC: 1402.5, 1402.5.1, 1402.5.2, 1402.5.3, 1402.5.4, 1402.5.5, 1402.6

Proponents: Brendan Smith, CannonDesign, CannonDesign (bsmith@cannondesign.com); Joseph ONeill, CannonDesign, Self - Senior Vice President (jponeill@cannondesign.com)

2024 International Building Code

Revise as follows:

1402.5 Vertical and lateral flame propagation.
Exterior walls on *buildings* of Type I, II, III and IV construction that contain a combustible *exterior wall covering*, combustible insulation or a combustible *water-resistive barrier* shall comply with Sections 1402.5.1 through 1402.5.5, as applicable. For the purposes of this section, combustibility shall be determined by the definition in NFPA 285. Where compliance with NFPA 285 and associated acceptance criteria is required in Sections 1402.5.1 through 1402.5.5, the *exterior wall assembly* shall be tested in accordance with and comply with the acceptance criteria of NFPA 285.

1402.5.1 Combustible water-resistive barrier.
Exterior walls containing a combustible *water-resistive barrier* shall comply with Section 1402.6.

1402.5.2 Metal composite material (MCM) .
Exterior walls containing metal composite material (MCM) systems shall comply with Section 1406.

1402.5.3 Exterior insulation and finish system (EIFS) .
Exterior walls containing an exterior insulation and finish system (EIFS) shall comply with Section 1407.

1402.5.4 High-pressure decorative exterior-grade compact laminate (HPL) system .
Exterior walls containing a high-pressure decorative exterior-grade compact laminate (HPL) system shall comply with Section 1408.

1402.5.5 Foam plastic insulation.
Exterior walls containing *foam plastic insulation* shall comply with Section 2603.

Revise as follows:

1402.6 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, c~~C~~ombustibility shall be determined ~~in accordance with Section 703.3~~ by the definition in 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. *Exterior walls* in which the *water-resistive barrier* is the only combustible component and the *exterior wall* has an *exterior wall* covering of brick, concrete, stone, terra cotta, stucco or steel with minimum thicknesses in accordance with Table 1404.2.
2. *Exterior 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 E1354, 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 E84 or UL 723, with test specimen preparation and mounting in accordance with ASTM E2404.

Attached Files

- **XL-Perm-Ultra-NP-3.pdf**
  https://www.cdpaccess.com/proposal/9587/29661/files/download/4016/
- **XL_Perm_DS_11-15.pdf**
  https://www.cdpaccess.com/proposal/9587/29661/files/download/4015/
- **SUBMITTAL-ENVIRO-BARRIER-SILICONEAWB.pdf**
  https://www.cdpaccess.com/proposal/9587/29661/files/download/4014/
- **GE_ELEMAX_Technical Data Sheet.pdf**
  https://www.cdpaccess.com/proposal/9587/29661/files/download/4013/

Reason: Sections 1402.5 and 1402.6 are where the code determines if testing per NFPA 285 is required. 2024 IBC does not currently define "Combustible," but implies that anything not considered "noncombustible" per Section 703.3 is combustible.

Since the purpose of these sections are to determine applicability of testing for vertical and lateral flame propagation of exterior walls containing combustible materials per NFPA 285, and NFPA 285 does define "Combustible," it would make sense to utilize the NFPA 285 definition. (*2023 NFPA 285: "Combustible (Material). A material that, in the form in which it is used and under the conditions anticipated, will ignite and burn; a material that does not meet the definition of noncombustible or limited combustible.")*

The NFPA definition introduces another term that is not defined by IBC; "limited combustible." And it excludes materials considered to be "limited combustible" from being considered "combustible." 2024 IBC Section 703.3.1 Exception includes a similar carve out for materials meeting specific criteria to be considered noncombustible. Presumably, this exception mostly applies to gypsum board.

NFPA 285 considers materials to be "limited combustible" where they are tested per ASTM E2965 and meet certain criteria for peak heat release and total heat release. There are currently a number of silicone-based water resistive barriers on the market that meet these criteria when tested per ASTM E1354, and could likely meet them when retested per E2965 (refer to product data sheets in attachments for examples). If these sections were to use the NFPA definition of combustible, these products would not be considered combustible and could be used without triggering the need for an NFPA 285 test of the full assembly (assuming no other triggers).

Use of such water resistive barriers in lieu of more combustible water resistive barriers would reduce the risk of flame propagation. The ability to forgo the need for designing to a specific NFPA tested assembly, providing engineering judgements for minor variations, and maintaining compliance with that assembly throughout bidding and construction could encourage greater use of these lower-risk materials and improve fire safety in our new building stock.

Cost Impact: Decrease

Estimated Immediate Cost Impact:

Approximately $4200 per project.

Estimated Immediate Cost Impact Justification (methodology and variables):

The functional difference from current state for a project team utilizing a WRB that does not need to be considered combustible would be a reduction in time spent due to not requiring any NFPA tested assemblies.
The size and nature of each project can vary significantly, including the number, type, and complexity of different exterior wall assemblies utilized, as well as the speed of work and billing rates of each employee. The below assumptions were made in consultation with the Director of Quality and the Specifications Team Leader at our firm, and based on their experience working with teams across our 17 offices

Design

- Architect research time to find a tested assembly: Assume 3 hrs per assembly x 3 assemblies per project x $175 per hr rate = $1575.
- Spec writer and architect time to develop portions of the specs to cover the NFPA requirements: assume 3 hrs at $175 per hr rate = $525
- Review of NFPA related submittals from contractor: 6 hrs at $175 per hr rate = $1050. Assumes some processing, coordination, and resubmittal time.

Engineering:

- Preparation of engineering analysis by fire engineer to account for variations from exact tested assembly: 3 hrs at $175 per hr rate = $525

Construction:

- Preparation of NFPA related submittals showing compliance with the tested assembly: 3 hrs at $175 per hr rate = $525
- Assume no, or limited savings in materials even though manufacturers not having to test assemblies could lead to savings, since such costs would be diffused over all of the projects they sell products to. = $0

Estimated Life Cycle Cost Impact:

$0

Estimated Life Cycle Cost Impact Justification (methodology and variables):

We predict no change in life cycle cost as there is no significant change in function of any materials.

FS99-24

FS100-24

IBC: 1402.5, 1402.5.1, 1402.5.2, 1402.5.3, 1402.5.4, 1402.5.5 (New), 1402.5.6 (New), 1402.5.5

Proponents: Robert Marshall, FCAC, FCAC (fcac@iccsafe.org)

2024 International Building Code

1402.5 Vertical and lateral flame propagation.
Exterior walls on *buildings* of Type I, II, III and IV construction that contain a combustible *exterior wall covering*, combustible insulation or a combustible *water-resistive barrier* shall comply with Sections 1402.5.1 through 1402.5.5, as applicable. Where compliance with NFPA 285 and associated acceptance criteria is required in Sections 1402.5.1 through 1402.5.5, the *exterior wall assembly* shall be tested in accordance with and comply with the acceptance criteria of NFPA 285.

1402.5.1 Combustible water-resistive barrier.
Exterior walls containing a combustible *water-resistive barrier* shall comply with Section 1402.6.

1402.5.2 Metal composite material (MCM) .
Exterior walls containing metal composite material (MCM) systems shall comply with Section 1406.

1402.5.3 Exterior insulation and finish system (EIFS) .
Exterior walls containing an exterior insulation and finish system (EIFS) shall comply with Section 1407.

1402.5.4 High-pressure decorative exterior-grade compact laminate (HPL) system .
Exterior walls containing a high-pressure decorative exterior-grade compact laminate (HPL) system shall comply with Section 1408.

Add new text as follows:

1402.5.5 Insulated metal panel (IMP) systems. Exterior walls containing IMP systems shall comply with Section 1409.

1402.5.6 Exterior wall veneers manufactured using combustible adhesives. Exterior walls containing exterior wall veneers manufactured using combustible adhesives shall comply with Section 1402.7.

Revise as follows:

~~1402.5.5~~ 1402.5.7 Foam plastic insulation.
Exterior walls containing *foam plastic insulation* shall comply with Section 2603.

Reason: During the last cycle, Section 1402.5 was revised by FS122-21 (AM) to collect references for relevant IBC sections containing specific requirements for testing of exterior wall assemblies in accordance with, and meeting the acceptance criteria of, NFPA 285. Also added last cycle were new Section 1409 for insulated metal panel (IMP) products and systems (FS149-21 Part I, AS) and new Section 1402.7 for exterior wall veneers manufactured using combustible adhesives (FS125-21, AMPC1). Both of these new sections contain requirements for testing and compliance with NFPA 285 are, therefore, their inclusion in Section 1402.5 is appropriate and will maintain consistency and completeness of the provision.

FCAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2023 and early 2024 the FCAC has held several virtual meetings and one in-person meeting open to any interested party. In addition, there were numerous virtual Working Group meetings for the current code development cycle, which included members of the committee as well as interested parties. Related documents and reports are posted on the **FCAC Website**

Cost Impact: The change proposal is editorial in nature or a clarification and has no cost impact on the cost of construction

Justification for no cost impact:

This change proposal simply adds references to other code sections where existing requirements are located. As such, there are no new technical requirements and no cost impact.

FS100-24

FS101-24

IBC: 1402.5, 1402.5.1, 1402.5.2, 1402.5.3, 1402.5.4, 1402.5.5, 1402.5.6 (New)

Proponents: Theresa Weston, The Holt Weston Consultancy, Rainscreen Association in North America (holtweston88@gmail.com)

2024 International Building Code

Revise as follows:

1402.5 Vertical and lateral flame propagation.
Exterior walls on *buildings* of Type I, II, III and IV construction that contain a combustible *exterior wall covering*, combustible insulation or a combustible *water-resistive barrier* shall comply with Sections 1402.5.1 through ~~1402.5.5~~ 1402.5.6, as applicable. Where compliance with NFPA 285 and associated acceptance criteria is required in Sections 1402.5.1 through ~~1402.5.5~~ 1402.5.6, the *exterior wall assembly* shall be tested in accordance with and comply with the acceptance criteria of NFPA 285.

1402.5.1 Combustible water-resistive barrier.
Exterior walls containing a combustible *water-resistive barrier* shall comply with Section 1402.6.

1402.5.2 Metal composite material (MCM) .
Exterior walls containing metal composite material (MCM) systems shall comply with Section 1406.

1402.5.3 Exterior insulation and finish system (EIFS) .
Exterior walls containing an exterior insulation and finish system (EIFS) shall comply with Section 1407.

1402.5.4 High-pressure decorative exterior-grade compact laminate (HPL) system .
Exterior walls containing a high-pressure decorative exterior-grade compact laminate (HPL) system shall comply with Section 1408.

1402.5.5 Foam plastic insulation.
Exterior walls containing *foam plastic insulation* shall comply with Section 2603.

Add new text as follows:

1402.5.6 Fiber-Reinforced Polymer. *Exterior Walls* containing *fiber-reinforced polymer* shall comply with Section 2613.

Reason: This proposal completes the list of pointers added in the last code change cycle. Section 2613.5 contains requirements for fiber-reinforced polymer materials used in exterior walls and further links to NFPA285 testing requirements. The inclusion of pointers was accepted in the last cycle as it "assists users of the Code by providing reference to all the relevant sections of Chapter 14 and Chapter 26 containing specific requirements for exterior wall assemblies needing testing to NFPA 285" (as stated in the 2021 Report of the Committee Action Hearings on the 2021 Editions of the Group A International Codes" Item FS122-21). This proposal has the same purpose of assisting users of the Code.

Cost Impact: The change proposal is editorial in nature or a clarification and has no cost impact on the cost of construction

Justification for no cost impact:

This proposal does not change requirements but only provides a pointer to existing requirements to aid the user of the code.

FS102-24

IBC: 1402.5, ULC Chapter 35 (New)

Proponents: William Koffel, Koffel Associates, Inc., Fire Safe North America (wkoffel@koffel.com)

2024 International Building Code

Revise as follows:

1402.5 Vertical and lateral flame propagation.

Exterior walls on *buildings* of Type I, II, III and IV construction that contain a combustible *exterior wall covering*, combustible insulation or a combustible *water-resistive barrier* shall comply with Sections 1402.5.1 through 1402.5.5, as applicable. Where compliance with NFPA 285 and associated acceptance criteria is required in Sections 1402.5.1 through 1402.5.5, the *exterior wall assembly* shall be tested in accordance with and comply with the acceptance criteria of NFPA 285.

Exception: Buildings of Type IV-A, IV-B and IV-C construction that are tested in accordance with CAN/ULC-S134, and comply with the following:

1. Flaming on or in the exterior wall covering does not exceed 5 m (16.4 ft) above the opening.
2. Flaming on or in the exterior wall covering does not exceed 5 m (16.4 ft) above the opening.
3. Heat flux during the flame exposure on the exterior wall covering does not exceed 35 kW/m measured at 3.5 m (11.5 ft) above the opening.

Add new standard(s) as follows:

ULC

Underwriters Laboratories of Canada
13775 Commerce Parkway
Richmond, BC V6V 2V4

CAN/ULC-S134 Standard Method of Fire Test of Exterior Wall Assemblies

Staff Analysis: A review of the standard proposed for inclusion in the code, CAN/ULC-S134 Standard Method of Fire Test of Exterior Wall Assemblies, with regard to some of the key ICC criteria for referenced standards (Section 4.6 of CP#28) will be posted on the ICC website on or before March 18, 2024.

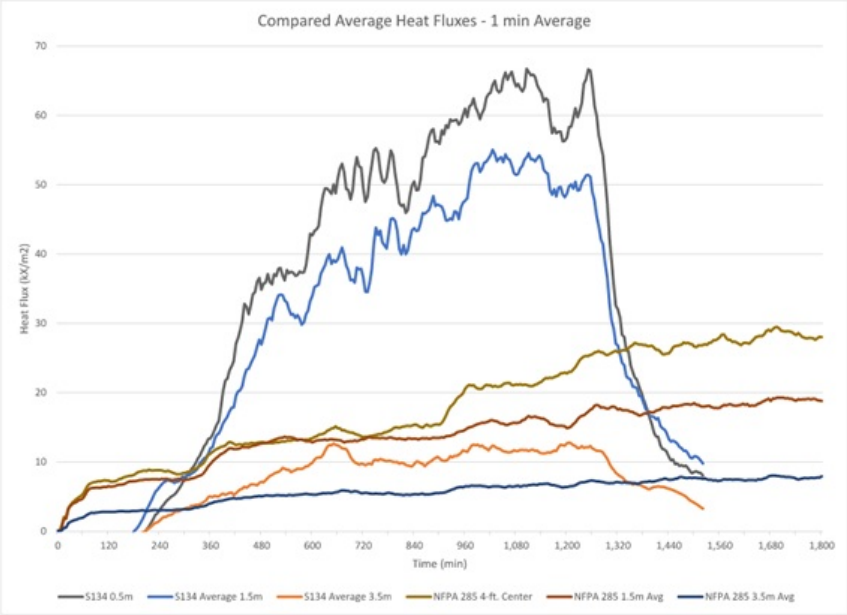
Reason: This test method is being introduced as an alterative to NFPA 285 because of the more intense fire exposure on the façade of the exterior wall covering. This test method is considered to be a more severe assault on the wall system, making it a more conservative assessment of the potential for flame propagation.

In 2015, the International Code Council (ICC) Board of Directors created an Ad Hoc Committee on Tall Wood Buildings (TWB) to study the topic of tall wood buildings and to propose code changes to the International Building Code for the 2021 edition. Over a three-year process, the TWB reviewed many significant considerations relevant for tall wood buildings. Their work resulted in establishing a combination of prescriptive limits and test performance requirements for tall wood buildings up to 18 stories or 270 feet in height. The TWB proposed three additional construction type classifications relative to mass timber. These classifications, Class IV-A, B and C permit a stepped increase in height and area relative to the level of passive protection, or area of exposed interior timber. During the development of fire safety of exterior wall provisions, the TWB considered the use of three exterior wall fire tests: NFPA 285-2012, FM 4880, CAN/ULC-S134-2013. The TWB considered each of these test methods, discussed the unknowns about proven performance, debated height requirements, as well as heard concerns from the fire service and other industry professionals. Ultimately a proposal was put forth that tall wood buildings up to 18 stories shall meet NFPA 285, with an additional requirement that the exterior wall insulation and covering also be non-combustible. This requirement has been included in the International Building Code since the 2021 edition.

CAN/ULC-S134 is a two-story test method developed by National Research Council of Canada in the 1980's. The test simulates an enclosure fire exposure via a 1.37 m high x 2.6 m wide opening with the fire impingement on the exterior surface of the test specimen. The test method enables complete exterior wall coverings be installed on the test support rig with no concrete or masonry substrate, if required. The overall dimension of the test assembly is 10 m high by 5 m wide (i.e. 30.5 ft tall by 15 ft wide), which is larger than the NFPA 285 test facility which is 5.3 m high x 4.1 m wide (i.e. 17.5 ft high by 13.5 ft wide). In both tests, the exterior wall covering is tested a

complete system including any external cladding, insulation, external substrate framing and internal wall membrane and must include typical vertical and horizontal joints directly above the opening.

In the NFPA 285 test method, the room burner output is gradually increased to provide a maximum of approximately 900 kW over the 30 minute test duration. A window burner is ignited 5 minutes after the room burner and is gradually increased to contribute an additional 400 kW over the remaining 25 minute test period. In total, the burners are calibrated to achieve average heat fluxes, at the surface of a noncombustible test wall, of approximately 35-40 kW/m2 at 0.92 m (36 inches) above the opening and 15 kW/m2 at 1.54 m (60 inches) above the opening during the peak fire source period of 25-30 minutes. However, these maximum heat flux values are not reached until 25 minutes after the start of the test. The average heat flux achieved over the first 15 minutes of the test is approximately 20 kW/m2, while the average heat flux achieved during the last 15 minutes of the test (which is the period of maximum heat exposure) is approximately 36 kW/m^2. The graph below demonstrates the comparison of the fire exposure on the exterior wall in each test method.



In contrast, the CAN/ULC-S134 test uses linear propane burners designed to produce a burner output of approximately 120 g/s propane (5.5MW) within the room. The total test duration is 25 minutes with 5 minute fire growth phase, 15 minute steady state phase and 5 minute fire decay phase. This fire source is calibrated to achieve a mean heat flux of 45 ± 5 kW/m2 measured 0.5 m (19.5 inches) above the opening soffit, and an average of 27 ± 3 kW/m2 measured 1.5 m (58 inches) above the soffit of the opening, averaged over the entire 15 minute steady state period. Measurements using a noncombustible exterior wall system during the development of the test method demonstrated that this produces an average heat flux of 16 kW/m2 at a height of 3.5 m (136.5 inches, or 11.4 ft) above the opening.

Cost Impact: The change proposal is editorial in nature or a clarification and has no cost impact on the cost of construction

Justification for no cost impact:

This change provides an optional alternative to the existing requirements, without replacing any existing compliance paths. The cost of both tests is comparable.

FS102-24

FS103-24

IBC: 1402.6

Proponents: David Bueche, Hoover Treated Wood Products (dbueche@frtw.com)

2024 International Building Code

Revise as follows:

1402.6 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.Combustibility shall be determined in accordance with Section 703.3. 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. *Exterior walls* in which the *water-resistive barrier* is the only combustible component and the *exterior wall* has an *exterior wall* covering of brick, concrete, stone, terra cotta, stucco or steel with minimum thicknesses in accordance with Table 1404.2.
2. *Exterior 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 E1354, 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 E84 or UL 723, with test specimen preparation and mounting in accordance with ASTM E2404.
3. Walls constructed of *fire-retardant-treated wood* complying with Section 2303.2 and tested in accordance with and comply with the acceptance criteria of NFPA 285, and the *water-resistive barrier* complies with either Exception 1 or Exception 2.

Reason: Building cladding fires, such as the Grenfell Tower fire in London, UK, 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.

One of the arguments from the last code cycle was that the industry wanted this exception because they cannot pass NFPA 285. However, recent tests have resulted in a UL exterior wall system (UL-EWS0045) for an FRTW lumber and plywood assembly with two weather-resistive barrier options demonstrating compliance with NFPA 285.

Cost Impact: Decrease

Estimated Immediate Cost Impact:

There is a potential for construction savings where FRTW use was denied due to existence of a combustible water-resistive barrier.

A cost decrease of $27.46 per square foot is possible in an R-2 Occupancy if Type IIIA Construction can be used in lieu of Type IIA Construction. See the August 2023 ICC Building Valuation Data where an R-2 Occupancy of Type IIIA Construction has a square foot construction cost $175.96 and an R-2 Occupancy of Type IIA Construction has a square foot construction cost of $203.42.

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Estimated Immediate Cost Impact Justification (methodology and variables):

Fire-retardant-treated wood is generally less expensive than noncombustible materials. Because FRTW may be used as an alternate to these materials, the cost may be less.

FS103-24

FS104-24

IBC: 1402.6, 2603.5.7

Proponents: Alexander Haldeman, James Hardie Building Products, James Hardie Building Products (alex.haldeman@jameshardie.com)

2024 International Building Code

Revise as follows:

1402.6 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.Combustibility shall be determined in accordance with Section 703.3. 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. *Exterior walls* in which the *water-resistive barrier* is the only combustible component and the *exterior wall* has an *exterior wall* covering of brick, concrete, stone, terra cotta, stucco, ~~or~~ steel or fiber-cement with minimum thicknesses in accordance with Table 1404.2.
2. *Exterior 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 E1354, 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 E84 or UL 723, with test specimen preparation and mounting in accordance with ASTM E2404.

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 1404.17 and Section 1404.17.1 or 1404.17.2.

Reason: This change proposal is editorial in nature, and harmonizes materials listed in section 1402.6 with those listed in 2603.5.7

Cost Impact: The change proposal is editorial in nature or a clarification and has no cost impact on the cost of construction

Justification for no cost impact:

This proposal provides harmonization of materials listed as exceptions. No additional requirements are being added.

FS105-24

IBC: 1402.7

Proponents: Robert Marshall, FCAC, FCAC (fcac@iccsafe.org)

2024 International Building Code

Revise as follows:

1402.7 Exterior wall ~~veneers~~ coverings manufactured using combustible adhesives used in exterior wall assemblies.
Exterior wall assemblies 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 an exterior wall ~~*veneer*~~ covering manufactured using a combustible adhesive to laminate a metal core with noncombustible facing materials shall be tested in accordance with, and comply with, the acceptance criteria of NFPA 285.~~,~~ Such testing shall be performed on exterior wall assemblies that include the exterior wall covering with the adhesive level at the maximum application rate intended for use. Combustibility shall be determined in accordance with Section 703.3.

Reason: Concern over possible misinterpretation of “veneer” in Section 1402.7 has prompted this proposal to clarify the intended building materials and systems that are the scope of the provision.

Adopted during the last cycle under FS125-21 (AMPC1), the intent of 1402.7 was to ensure the IBC requires that vertical and lateral flame propagation performance is verified for exterior wall assemblies containing a type of exterior panel product composed of noncombustible facings and noncombustible cores that are adhered to together using a combustible adhesive. The reason statement for FS125-21 included two figures with images of examples of the subject products – metal honeycomb core panels and corrugated metal core panels. Figures 1 and 2 are reproduced below.

The IBC defines veneer as, “**VENEER**. A facing attached to a wall for the purpose of providing ornamentation, protection or insulation, but not counted as adding strength to the wall.” As used in Section 1402.7, there is concern that “veneer” could be misinterpreted to make this requirement apply where any exterior wall assembly has a noncombustible surfacing adhered to any metal substrate using a combustible adhesive instead of only the intended panelized products. Changing the terminology from “veneer” to “panel system” clarifies the requirement.

FCAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2023 and early 2024 the FCAC has held several virtual meetings and one in-person meeting open to any interested party. In addition, there were numerous virtual Working Group meetings for the current code development cycle, which included members of the committee as well as interested parties. Related documents and reports are posted on the **FCAC Website**

Figure 1. Metal honeycomb core (facing removed on lower half) – Combustible adhesives used to attach both top and bottom facings.

Figure 2. Corrugated metal core panel (End View) - Combustible adhesives used to attach both top and bottom facings.

Cost Impact: The change proposal is editorial in nature or a clarification and has no cost impact on the cost of construction

Justification for no cost impact:

This change proposal clarifies the existing code requirement to address a potential misinterpretation as to what building products and use the code provision applies.

FS105-24

FS106-24

IBC: 1402.8

Proponents: Marcelo Hirschler, GBH International, GBH International (mmh@gbhint.com); Tim Earl, GBH International, Self (tearl@gbhint.com)

2024 International Building Code

Revise as follows:

1402.8 Vertical and lateral flame propagation compliance methods.
When exterior wall assemblies are required in this chapter to be tested for vertical and lateral flame propagation in accordance with and comply with the acceptance criteria of NFPA 285, compliance with the requirements shall be established by any of the following:

1. An *exterior wall assembly* tested in accordance with and meeting the acceptance criteria of NFPA 285.
2. An *exterior wall assembly* design *listed* by an *approved agency* for compliance with NFPA 285.
3. An *approved* engineering analysis based on an assembly or condition tested in accordance with and meeting the acceptance criteria of NFPA 285.

Reason: The wording in the upcoming edition of NFPA 285, which contains a new chapter associated with analysis methods describes the process as an "engineering analysis" and not just an analysis.

The wording in section 12.1 reads: "12.1 General.

This chapter shall cover the extension of compliant test results obtained from NFPA 285 to wall assemblies that differ from a tested wall assembly in terms of materials, components, or configuration of materials via an engineering analysis."

Cost Impact: The change proposal is editorial in nature or a clarification and has no cost impact on the cost of construction

Justification for no cost impact:

clarification for consistency with NFPA 285 chapter 12.

FS107-24

IBC: 1403.2

Proponents: Theresa Weston, The Holt Weston Consultancy, Air Barrier Association of America (ABAA) (holtweston88@gmail.com)

2024 International Building Code

Revise as follows:

1403.2 Water-resistive barrier.
Not fewer than one layer of *water-resistive barrier* material 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*. The intersection between the *water-resistive barrier* material and fenestration openings shall be flashed and assembled in accordance with the fenestration manufacturer's installation instructions, or other *approved* methods for applications not addressed by the fenestration manufacturer's instructions. The water-resistive barrier material shall be continuous to the top of walls and terminated at penetrations and *building* appendages in a manner to meet the requirements of the exterior wall envelope as described in Section 1402.2. Where the *water-resistive barrier* also functions as a component of a continuous air barrier, the *water-resistive barrier* shall be installed as an air barrier in accordance with the *International Energy Conservation Code.*
Water-resistive barriers shall comply with one of the following:

1. No. 15 felt complying with ASTM D226, Type 1.
2. ASTM E2556, Type I or II.
3. Foam plastic insulating sheathing *water-resistive barrier* systems complying with Section 1402.2 and installed in accordance with manufacturer's installation instructions.
4. ASTM E331 in accordance with Section 1402.2.
5. Other *approved* materials installed in accordance with the manufacturer's installation instructions.

No. 15 asphalt felt and water-resistive barriers complying with ASTM E2556 shall be applied horizontally with the upper layer lapped over the lower layer not less than 2 inches (51 mm). Where joints occur, the upper and lower layer shall be lapped not less than 6 inches (152 mm).

Reason: This proposal recognizes the challenge of materials that serve multiple functions. In many projects a water-resistive barrier also serves as a major component of an air barrier assembly. This proposal seeks coordination of installation of water-resistive barriers between the IBC and IECC (where they may be used as a part of a continuous air barrier system) in order to streamline the compliance with both codes.

Cost Impact: The change proposal is editorial in nature or a clarification and has no cost impact on the cost of construction

Justification for no cost impact:

This change proposal does not add or change any code requirements. It only serves to coordinate the provisions between the IBC and IECC.

FS108-24

IBC: 1403.2, 1403.2.1 (New), 1705.21 (New)

Proponents: Theresa Weston, The Holt Weston Consultancy, Air Barrier Association of America (ABAA) (holtweston88@gmail.com)

2024 International Building Code

1403.2 Water-resistive barrier.
Not fewer than one layer of *water-resistive barrier* material 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*. The intersection between the *water-resistive barrier* material and fenestration openings shall be flashed and assembled in accordance with the fenestration manufacturer's installation instructions, or other *approved* methods for applications not addressed by the fenestration manufacturer's instructions. The water-resistive barrier material shall be continuous to the top of walls and terminated at penetrations and *building* appendages in a manner to meet the requirements of the exterior wall envelope as described in Section 1402.2. *Water-resistive barriers* shall comply with one of the following:

1. No. 15 felt complying with ASTM D226, Type 1.
2. ASTM E2556, Type I or II.
3. Foam plastic insulating sheathing *water-resistive barrier* systems complying with Section 1402.2 and installed in accordance with manufacturer's installation instructions.
4. ASTM E331 in accordance with Section 1402.2.
5. Other *approved* materials installed in accordance with the manufacturer's installation instructions.

No. 15 asphalt felt and water-resistive barriers complying with ASTM E2556 shall be applied horizontally with the upper layer lapped over the lower layer not less than 2 inches (51 mm). Where joints occur, the upper and lower layer shall be lapped not less than 6 inches (152 mm).

Add new text as follows:

1403.2.1 Special inspections. The installation of the *water-resistive barrier* shall comply with the provisions of Sections 1704.2 and 1705.21.

1705.21 Water-resistive barrier Installation. *Special inspections* shall be required for the installation of the *water-resistive barrier* and the intersection of the *water-resistive barrier* with flashing in accordance with Sections 1403.2.

Reason: It is estimated that 70% of construction claims are due to water and moisture issues in the enclosure. [2,5] According to a recent report on building enclosure damage, "Water intrusion... .dreaded by homeowners, contractors, and insurance adjusters alike. It is evident why, as it ranks as the second most common cause for property insurance claims and first for the most expensive type of claim. In addition, water intrusion accounts for 70% of construction litigation. On average, each incident costs $11,098; collectively, water intrusion costs over $20 billion annually throughout the United States.[6] Furthermore, data suggests these water intrusion issues are a result of incorrect installation:

- A survey of "top 100" general contracting firms found the "53% of all defects of defects originate from poor workmanship, supervision and inspection of trade contractors during construction." [2]
- A third party quality assurance inspection firm lists several defects in water-resistive barrier and flashing integration among the "top 10 construction defects observed across the U.S. in 2018." [3]

This proposal seeks to reduce water intrusion issues resulting from incorrect installation of the water-resistive barrier and/or integration of flashings with the water-resistive barrier through requiring a special inspection of water-resistive barrier installation.

It should be noted that EIFS and EIFS water-resistive barriers already are subject to special inspections.

Bibliography:

1. ABAA, Air Barrier Quality Assurance Program, https://www.airbarrier.org/qap-overview/
2. Grosskopf, K. R. and D. E. Lucas, “Identifying the Causes of Moisture-Related Defect Litigation in U. S. Building Construction”, COBRA 2008 – The Construction and Building Research Conference of the Royal Institution of Chartered Surveyors, Dublin, Sept 4-5, 2008
3. Hoch, Jeff, “The Top 10 Construction Defects Observed Across the U.S. in 2018, QualityBuilt, March 12, 2019; https://www.qualitybuilt.com/resources/top-10-construction-defects-2018/
4. Report of the Barrett Commission of Inquiry into the Quality of Condominium Construction in British Columbia, Vancouver BC, 1998.
5. Stroik, Brian, “Mock-ups: The Crash Test Dummy for Building Enclosures’” ABAA Conference, Norfolk, VA, March 26-27 2019. https://www.abaaconference.com/wp-content/uploads/2019/04/Mock-Ups-The-Crash-Test-Dummy-for-Building-Enclosures-Brian-Stroik.pdf
6. Swart, Amelia, “Damage Report: Water Intrusion”, Forum Forensics, September 20, 2022, https://www.forumforensics.com/blog/damage-report-water-intrusion

Cost Impact: Increase

Estimated Immediate Cost Impact:

$.20 to .40 per square foot of opaque wall area.

Estimated Immediate Cost Impact Justification (methodology and variables):

This estimate was based on the cost of quality audits reported by the Air Barrier Association of America [1] and is likely a high estimate as an air barrier quality audit would cover more items than a special inspection of the water-resistive barrier and flashing alone. The increased immediate cost needs to be weighed against the liability for potential water intrusion damage if the water-resistive barrier and flashing are not installed correctly. Experience has shown that because of the relative inaccessibility of the water management components in the building enclosures, rebuilding a wall system can cost twice as much as the original wall cost per sq. ft. [4]

FS108-24

FS109-24

IBC: 1403.2, ABTG (New)

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

2024 International Building Code

Revise as follows:

1403.2 Water-resistive barrier.
Not fewer than one layer of *water-resistive barrier* material 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*. The intersection between the *water-resistive barrier* material and fenestration openings shall be flashed and assembled in accordance with the fenestration manufacturer's installation instructions, or other *approved* methods for applications not addressed by the fenestration manufacturer's instructions. The water-resistive barrier material shall be continuous to the top of walls and terminated at penetrations and *building* appendages in a manner to meet the requirements of the exterior wall envelope as described in Section 1402.2. *Water-resistive barriers* shall comply with one of the following:

1. No. 15 felt complying with ASTM D226, Type 1.
2. ASTM E2556, Type I or II.
3. Foam plastic insulating sheathing *water-resistive barrier* systems complying with ANSI/ABTG FS200.1 or Section 1402.2 and installed in accordance with manufacturer's installation instructions.
4. ASTM E331 in accordance with Section 1402.2.
5. Other *approved* materials installed in accordance with the manufacturer's installation instructions.

No. 15 asphalt felt and water-resistive barriers complying with ASTM E2556 shall be applied horizontally with the upper layer lapped over the lower layer not less than 2 inches (51 mm). Where joints occur, the upper and lower layer shall be lapped not less than 6 inches (152 mm).

Add new text as follows:

ABTG ANSI/ABTG FS200.1-2022:. Standard for Use of Foam Plastic Insulating Sheathing (FPIS) in Building Envelopes: Above-grade Walls

Staff Analysis: A review of the standard proposed for inclusion in the code, ANSI/ABTG FS200.1 - 2022:. Standard for Use of Foam Plastic Insulating Sheathing (FPIS) in Building Envelopes: Above-grade Walls, with regard to some of the key ICC criteria for referenced standards (Section 4.6 of CP#28) will be posted on the ICC website on or before March 18, 2024.

Reason: The ANSI/ABTG FS200.1 standard (see Bibliography) provides a complete set of performance testing requirements and criteria for FPIS WRB systems as an alterative to Section 1402.2. The water-resistance testing and criteria of 1402.2 are consistent with that required by the FS200.1 standard. In addition to installed system water-resistance testing, the FS200.1 standard addresses material properties and durability for various WRB system components, requires installation instructions to be consistent with the systems as tested, and also addresses manufacturer and third-party quality control and labeling.

Bibliography: ANSI/ABTG FS200.1 – 2022, Standard for the Use of Foam Plastic Insulating Sheathing (FPIS) in Building Envelopes: Above-grade Walls, Applied Building Technology Group, LLC, Madison, WI. https://www.appliedbuildingtech.com/standards

Cost Impact: The change proposal is editorial in nature or a clarification and has no cost impact on the cost of construction

Justification for no cost impact:

The proposal adds an option (voluntary) for FPIS WRB systems qualified and specified through an ANSI consensus standard. It leaves current code minimum requirements unchanged. Therefore, it does not impact cost of construction.

FS109-24

FS110-24

IBC: 1403.11

Proponents: Matthew Dobson, VSI, VSI (mdobson@vinylsiding.org)

2024 International Building Code

Revise as follows:

1403.11 Polypropylene siding.
Polypropylene siding shall be certified and *labeled* as conforming to the requirements of ASTM D7254 and those of Section 1403.11.1 or 1403.11.2 by an approved agency. *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*.~~

Reason: This change is a cleanup to remove installation provision in the material standards section. The pointer is left here so building officials know where to go for installation requirements.

Cost Impact: The change proposal is editorial in nature or a clarification and has no cost impact on the cost of construction

Justification for no cost impact:

Removal of unnecessary/redundant words.

FS111-24

IBC: SECTION 202 (New), 1403.14, ASTM Chapter 35 (New)

Proponents: Matthew Dobson, VSI, VSI (mdobson@vinylsiding.org)

2024 International Building Code

Add new definition as follows:

BACKED VINYL SIDING.
A cladding product with manufacturer-installed foam plastic backing material as an integral part of the cladding product.

Revise as follows:

1403.14 Insulated vinyl siding and backed vinyl siding.
Insulated vinyl siding and *backed vinyl siding* shall be certified and *labeled* as conforming to the requirements of ASTM D7793 and D7445, respectively, by an *approved agency*.

Add new standard(s) as follows:

ASTM

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

ASTM D7445-24	Standard Specification for Rigid Poly(Vinyl Chloride) (PVC) Siding with Foam Plastic Backing (Backed Vinyl Siding)

Staff Analysis: A review of the standard proposed for inclusion in the code, ASTM D7445-24 Standard Specification for Rigid Poly(Vinyl Chloride) (PVC) Siding with Foam Plastic Backing (Backed Vinyl Siding), with regard to some of the key ICC criteria for referenced standards (Section 4.6 of CP#28) will be posted on the ICC website on or before March 18, 2024

Reason: This change brings in a new standardized product category which is the same as insulated vinyl siding without the the R-value component. It is a board product with no claimed r-value nor considered a continuous insulation. It is a product that has been commercialize for 20 years and by adding it to the code it will help to differentiate the two categories and provide building officials with an understanding of difference between the two categories. Their installations methods are the same, and we'll address the installation section in the next cycle.

Cost Impact: The change proposal is editorial in nature or a clarification and has no cost impact on the cost of construction

Justification for no cost impact:

This change is adding an a new product category for reference and regulation, but is not making any requirements on its use.

FS112-24

IBC: 1403.15 (New), 1404.19 (New), 1404.19.1 (New), 1404.19.2 (New), 2605.4 (New), ASTM Chapter 35 (New)

Proponents: Robert Marshall, FCAC, FCAC (fcac@iccsafe.org)

2024 International Building Code

Add new text as follows:

1403.15 Plastic lumber or wood-plastic composite exterior wall covering materials. Where plastic lumber materials and wood-plastic composite materials are used as exterior wall coverings, such materials shall be *listed* and labeled in accordance with ASTM D8484 and shall be installed in accordance with the requirements of Section 1404.19 and the manufacturer's instructions. The materials shall be secured to the building so as to provide weather protection for the exterior walls of the building.

1404.19 Plastic lumber or wood-plastic composite exterior wall covering materials. Plastic lumber materials and wood-plastic composite materials used as exterior wall coverings shall comply with this section and Section 1403.15.

1404.19.1 Design wind pressure 30 pounds per square foot or less. Plastic lumber and wood-plastic composite exterior wall coverings materials shall be limited to exterior walls located in areas where the design wind pressure determined in Section 1609 speed does not exceed 30 pounds per square foot (1.44 kN/m^2) except as provided for in 1404.19.2.

1404.19.2 Design wind pressure greater than 30 pounds per square foot. Where the design wind pressured determined in Section 1609 exceeds 30 pounds per square foot (1.44 kN/m^2), tests or calculations indicating compliance with Chapter 16 shall be submitted.

2605.4 Plastic lumber or wood-plastic composite exterior wall covering materials. Plastic lumber materials or wood-plastic composite materials used as exterior wall covering shall comply with Sections 1403 and 1404.

Add new standard(s) as follows:

ASTM

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

D8484-23	Standard Specification for Plastic Lumber Materials and Wood-Plastic Composite Materials Used as Exterior Wall Coverings

Staff Analysis: A review of the standard proposed for inclusion in the code, ASTM D8484-23 Standard Specification for Plastic Lumber Materials and Wood-Plastic Composite Materials Used as Exterior Wall Coverings, with regard to some of the key ICC criteria for referenced standards (Section 4.6 of CP#28) will be posted on the ICC website on or before March 18, 2024.

Reason: The IBC code includes requirements for a variety of materials that are used as exterior wall coverings, meaning as components of exterior wall assemblies. They include some plastic siding materials, such as vinyl siding and polypropylene siding. The code also includes requirements for the use of plastic composite materials (which are defined in the IBC as "A generic designation that refers to wood/plastic composites, plastic lumber and similar materials.") in "exterior deck boards, stair treads, handrails and guards" (section 1409), with the requirements shown in section 2612.

In recent years some plastic lumber materials and/or wood-plastic composite materials have been used as components of exterior wall assemblies. However, neither section 1403 (Materials) nor section 1404 (Installation of wall coverings) nor section 1405 (Combustible materials on the exterior side of exterior walls) discuss the requirements for plastic lumber materials or wood-plastic composite materials when used as exterior wall coverings, and clearly there needs to be a difference between the use of materials as deck boards (horizontally) and as exterior wall coverings (vertically).

ASTM has recently developed a specification (ASTM D8484, Standard Specification for Plastic Lumber Materials and Wood-Plastic Composite Materials Used as Exterior Wall Coverings) that contains all the appropriate requirements. The properties contained in ASTM D8484 include the following: conditioning, wind load resistance, linear thermal expansion, resistance to moisture and temperature effects, weatherability (resistance to UV0, freeze-thaw resistance, biodeterioration, flame spread index (testing to ASTM E84), ignitability

(testing to NFPA 268), exterior to wall assembly fire performance (testing to NFPA 285, when required), and effect on fire resistance rating (when required).

The requirements contained in ICC-ES AC524 (Wood-plastic Composite Products Used as Exterior Siding) formed the basis of the requirements contained in ASTM D8484.

This proposal recommends incorporating these materials specifically into the code, with reference to them meeting the requirements from ASTM D8484.

Some relevant existing code sections are shown below, for comparison.

1403.9 Vinyl siding. Vinyl siding shall be certified and labeled as conforming to the requirements of ASTM D3679 by an *approved* quality control agency.

1404.14 Vinyl siding. Vinyl siding conforming to the requirements of this section and complying with ASTM D3679 shall be permitted on exterior walls where the design wind pressure determined in accordance with Section 1609 does not exceed 30 pounds per square foot (1.44 kN/m2). Where the design wind pressure exceeds 30 pounds per square foot (1.44 kN/m2), tests or calculations indicating compliance with Chapter 16 shall be submitted. Vinyl siding shall be secured to the building so as to provide weather protection for the exterior walls of the building.

1404.14.1 Application. The siding shall be applied over sheathing or materials listed in Section 2304.6. Siding shall be applied to conform to the water-resistive barrier requirements in Section 1402. Siding and accessories shall be installed in accordance with the approved manufacturer's instructions.

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 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.

1403.12.1 Flame spread index. The certification of the flame spread index shall be accompanied by a test report stating that all portions of the test specimen ahead of the flame front remained in position during the test in accordance with ASTM E84 or UL 723.

1403.12.2 Fire separation distance. The fire separation distance between a building with polypropylene siding and the adjacent building shall be not less than 10 feet (3048 mm).

1404.18 Polypropylene siding. Polypropylene siding conforming to the requirements of this section and complying with Section 1403.12 shall be limited to exterior walls located in areas where the wind speed specified in Chapter 16 does not exceed 100 miles per hour (45 m/s) and the

building height is less than or equal to 40 feet (12 192 mm) in Exposure C. Where construction is located in areas where the basic wind speed exceeds 100 miles per hour (45 m/s), or building heights are in excess of 40 feet (12 192 mm), tests or calculations indicating compliance with Chapter 16 shall be submitted. Polypropylene siding shall be installed 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.

2605.3 Plastic siding. Plastic siding shall comply with the requirements of Sections 1403 and 1404.

FCAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2023 and early 2024 the FCAC has held several virtual meetings and one in-person meeting open to any interested party. In addition, there were numerous virtual Working Group meetings for the current code development cycle, which included members of the committee as well as interested parties. Related documents and reports are posted on the **FCAC Website**

Cost Impact: The change proposal is editorial in nature or a clarification and has no cost impact on the cost of construction

Justification for no cost impact:

The proposed code change ensures that existing requirements for exterior wall assemblies and exterior wall coverings are applied to the use of plastic lumber and wood-plastic composite materials in those applications.

FS113-24

IBC: SECTION 202 (New), 1403.15 (New), 1403.15.1 (New), 1403.15.1.1 (New), ICC Chapter 35 (New)

Proponents: Keith P Nelson, DuPont, DuPont (keith.nelson@dupont.com)

2024 International Building Code

Add new definition as follows:

MAGNESIUM-OXIDE-CEMENT PANEL PRODUCT. The general name for a family of panel, board, and sheet products having a core consisting essentially of magnesium-oxide-cement and reinforced with organic or inorganic fibers.

Add new text as follows:

1403.15 Magnesium-oxide-cement panel product. *Magnesium-oxide-cement panel product* shall conform tothe requirements of ICC 1125. Installation shall be in accordance with the manufacturer's installation instructions or an *approved* design.

1403.15.1 Surface burning characteristics. *Magnesium-oxide-cement panel product* shall have, when tested in accordance with ASTM E84 or UL 723, a *listed flame spread index* of 25 or less. The ASTM E84 or UL 723 test shall be continued for an additional 20-minute period and the flame front shall not progress more than 10.5 feet (3200 mm) beyond the centerline of the burners at any time during the test.

1403.15.1.1 Alternate fire testing. *Magnesium-oxide-cement panel product* shall have,when tested in accordance with ASTM E2768, a *listed flame spread index* of 25 or less and where the flame front does not progress more than 10.5 feet (3200 mm) beyond the centerline of the burners at any time during the test.

Add new standard(s) as follows:

ICC

International Code Council, Inc.
200 Massachusetts Avenue, NW, Suite 250
Washington, DC 20001

1125 Standard for Classification of Magnesium Oxide Boards in Building and Construction (IS-MGOB)

Staff Analysis: A review of the standard proposed for inclusion in the code, ICC1125 Standard for Classification of Magnesium Oxide Boards in Building and Construction (IS-MGOB), with regard to some of the key ICC criteria for referenced standards (Section 4.6 of CP#28) will be posted on the ICC website on or before March 18, 2024.

Reason: The code change is introducing a new, North American construction material as defined by the ICC-1125 performance standard under development. The MgO industry desires to add these requirements to the IBC given the import of offshore materials, the scaling of North American production capacity, and the use of all these materials in commercial construction.

The surface burning characteristics limitation is similar to an existing exterior sheathing material in Section 2303.2. Applicable code requirements such as assembly fire performance tests still apply. Installation is to be in accordance with the manufacturer's instructions or an approved structural design for sheathing. The product is currently evaluated under ICC-ES Acceptance Criteria AC-386 for Fiber-Reinforced Magnesium-Oxide-Based Sheets and AC-530 for Fiber-Reinforced Magnesium-Oxide-Based Sheets with a Factory-Bonded Water-Resistive Overlay Membrane.

A Group B code proposal will be submitted for IBC Chapter 6 to address use of MgO in Type I, II and III construction:

602.3 Type III. Type III construction is that type of construction in which the exterior walls are of noncombustible materials and the interior building elements are of any material permitted by this code. Fire-retardant-treated wood framing and sheathing complying with Section 2303.2 and magnesium-oxide-cement panel product conforming with Section 1403.15 shall be permitted within exterior wall assemblies of a 2-hour rating or less.

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:
[...]

29. Magnesium-oxide-cement panel product conforming with Section 1403.15.

Cost Impact: The change proposal is editorial in nature or a clarification and has no cost impact on the cost of construction

Justification for no cost impact:

The proposal provides another sheathing product alternative and as such does not raise or decrease the cost of construction. The designer is free to choose which sheathing product is most effective for the application. The cost to the manufacturer is neutral as the testing requirements are similar for ICC-1125 and the ICC-ES Acceptance Criteria.

FS113-24

FS114-24

IBC: 1404.3, ANSI/ABTG (New)

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

2024 International Building Code

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 Tables 1404.3(3) or 1404.3(4) as applicable, or an *approved* design using accepted engineering practice for hygrothermal analysis. Vapor retarders shall be installed in accordance with Section 1404.3.2. The appropriate *climate zone* shall be selected in accordance with Chapter 3 of the International Energy Conservation Code.

Exceptions:

1. Basement walls.
2. Below-grade portion of any wall.
3. Construction where accumulation, condensation or freezing of moisture will not damage the materials.
4. A vapor retarder shall not be required in Climate Zones 1, 2, and 3.
5. In Climate Zones 4 through 8, a vapor retarder on the interior side of frame walls shall not be required where the assembly complies with Table 1404.3(5).
6. Vapor control design in accordance with ANSI/ABTG FS200.1.

Add new standard(s) as follows:

ANSI/ABTG FS200.1 - 2022:. Standard for Use of Foam Plastic Insulating Sheathing (FPIS) in Building Envelopes: Above-grade Walls

Staff Analysis: A review of the standard proposed for inclusion in the code, ANSI/ABTG FS200.1 - 2022:. Standard for Use of Foam Plastic Insulating Sheathing (FPIS) in Building Envelopes: Above-grade Walls, with regard to some of the key ICC criteria for referenced standards (Section 4.6 of CP#28) will be posted on the ICC website on or before March 18, 2024.

Reason: This proposal adds a reference to the ANSI/ABTG FS200.1 standard (see Bibliography) as an option for complying with the intent of Section 1404.3. Sections 3.4 and 3.5 of the ANSI/ABTG FS200.1 standard provide more complete criteria and options for evaluating moisture control and vapor retarder requirements than are included in Section 1404.3. The criteria in FS200.1 are based on the same research (see Bibliography) and rely on the same criteria used as the basis for development of the limited prescriptive solutions now included in Section 1404.3 for walls with foam plastic insulating sheathing on the exterior.

Bibliography: ANSI/ABTG FS200.1 – 2022, Standard for the Use of Foam Plastic Insulating Sheathing (FPIS) in Building Envelopes: Above-grade Walls, Applied Building Technology Group, LLC, Madison, WI. https://www.appliedbuildingtech.com/standards

ABTG (2015). Assessment of Water Vapor Control Methods for Modern Insulated Light-Frame Wall Assemblies, ABTG Research Report No. 1410-03, Applied Building Technology Group, LLC, Madison, WI. https://www.appliedbuildingtech.com/rr/1410-03

Crandell, J. H., “Assessment of Hygrothermal Performance and Design Guidance for Modern Light-Frame Wall Assemblies,” Advances in Hygrothermal Performance of Building Envelopes: Materials, Systems and Simulations, ASTM STP1599, P. Mukhopadhyaya and D. Fisler, Eds., ASTM International, West Conshohocken, PA, 2017, pp. 362–394, http://dx.doi.org/10.1520/STP159920160097

Cost Impact: The change proposal is editorial in nature or a clarification and has no cost impact on the cost of construction

Justification for no cost impact:

This proposal provides an additional voluntary design option for compliance and, therefore, does not change the cost of compliance. However, the added flexibility provided could result in some cases of a cost decrease depending on various factors such as overall assembly conditions, optimization based on materials specified and use of multi-functional capabilities, climate zone, coordination with energy code and possible trade-offs, etc.

FS114-24

FS115-24

IBC: 1404.4.1, AAMA Chapter 35 (New), ABTG (New)

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

2024 International Building Code

Revise as follows:

1404.4.1 Fenestration flashing.
Flashing of the fenestration to the wall assembly shall comply with the fenestration manufacturer's instructions or, for conditions not addressed by the fenestration manufacturer's instructions, shall comply with one of the following:

1. The *water-resistive barrier* manufacturer's flashing instructions.
2. The flashing manufacturer's flashing instructions.
3. The fenestration flashing methods included in FMA/AAMA/WDMA 500.
4. The fenestration flashing methods included in ANSI/ABTG FS200.1.
5. ~~3.~~ A flashing design or method of a *registered design professional*.
6. ~~4.~~ Other *approved* methods.

Add new standard(s) as follows:

AAMA

American Architectural Manufacturers Association
1900 E Golf Road, Suite 1250
Schaumburg, IL 60173

FMA/AAMA/WDMA 500-16: Standard Practice for the Installation of Mounting Flange Windows into Walls Utilizing Foam Plastic Insulating Sheathing (FPIS) with a Separate Water-Resistive Barrier

Add new text as follows:

ABTG ANSI/ABTG FS200.1-2022:. Standard for Use of Foam Plastic Insulating Sheathing (FPIS) in Building Envelopes: Above-grade Walls

Staff Analysis: A review of the standards proposed for inclusion in the code, FMA/AAMA/WDMA 500-16 Standard Practice for the Installation of Mounting Flange Windows into Walls Utilizing Foam Plastic Insulating Sheathing (FPIS) with a Separate Water-Resistive Barrier and ABTG ANSI/ABTG FS200.1-2022:. Standard for Use of Foam Plastic Insulating Sheathing (FPIS) in Building Envelopes: Above-grade Walls, with regard to some of the key ICC criteria for referenced standards (Section 4.6 of CP#28) will be posted on the ICC website on or before March 18, 2024.

Reason: The flashing methods included in the FMA/AAMA/WDMA 500 standard (see Bibliography) provides for flashing of windows installed using a window buck on walls with foam sheathing and a separate WRB material. The ANSI/ABTG FS200.1 standard (see Bibliography) provides for flashing of windows on walls with foam sheathing used as the WRB, including with or without a window buck (it also references the FMA/AAMA/WDMA 500 standard as well as performance testing of installation methods in accordance with AAMA 504). Both of these standards are compatible and thoroughly vetted through field experience and laboratory testing (see Bibliography).

Bibliography: FMA/AAMA/WDMA 500-16: Standard Practice for the Installation of Mounting Flange Windows into Walls Utilizing Foam Plastic Insulating Sheathing (FPIS) with a Separate Water-Resistive Barrier, https://store.fgiaonline.org/pubstore/ProductResults.asp?cat=0&src=500

ABTG (2021). Installation and Performance of Flanged Fenestration Units Mounted on Walls with Foam Plastic Insulating Sheathing, ABTG Research Report No. 2104-01, Applied Building Technology Group, LLC, Madison, WI, https://www.appliedbuildingtech.com/rr/2104-01

ANSI/ABTG FS200.1 – 2022, Standard for the Use of Foam Plastic Insulating Sheathing (FPIS) in Building Envelopes: Above-grade Walls, Applied Building Technology Group, LLC, Madison, WI. https://www.appliedbuildingtech.com/standards

Cost Impact: The change proposal is editorial in nature or a clarification and has no cost impact on the cost of construction

Justification for no cost impact:

This proposal adds two options to a list of existing options for fenestration flashing. It does not change existing requirements and provides additional options. Therefore, there is no cost impact as the use of the two added methods is voluntary (optional). Providing these options, however, could reduce cost where they are applicable and if used in specific cases.

FS115-24

FS116-24

IBC: 1406.10.3, 1408.10.4

Proponents: Robert Marshall, FCAC, FCAC (fcac@iccsafe.org)

2024 International Building Code

Revise as follows:

1406.10.3 ~~Full-scale tests~~Vertical and lateral flame propagation.
~~The~~Exterior wall assemblies containing an *MCM* system shall be tested in accordance with, and comply with, the acceptance criteria of NFPA 285. Such testing shall be performed on assemblies that include the *MCM* system with the MCM ~~in~~at the maximum thickness intended for use.

1408.10.4 ~~Full-scale tests~~Vertical and lateral flame propagation.
~~The~~Exterior wall assemblies containing an HPL system shall be tested in accordance with, and comply with, the acceptance criteria of NFPA 285. Such testing shall be performed on assemblies that include the HPL system with the HPL ~~in~~at the minimum and maximum thicknesses intended for use.

Reason: The correct application of NFPA 285, and the true intent of these two sections, is to test exterior wall assemblies *containing* these exterior wall covering systems in accordance with and to comply with the acceptance criteria of NFPA 285.Currently, both IBC Sections 1406.10.3 (for MCM) and Section 1408.10.4 (for HPL) appear to only require MCM and HPL exterior wall covering systems be tested in accordance with NFPA 285. This proposal clarifies the requirements so they will be correctly applied.

FCAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2023 and early 2024 the FCAC has held several virtual meetings and one in-person meeting open to any interested party. In addition, there were numerous virtual Working Group meetings for the current code development cycle, which included members of the committee as well as interested parties. Related documents and reports are posted on the **FCAC Website**

Cost Impact: The change proposal is editorial in nature or a clarification and has no cost impact on the cost of construction

Justification for no cost impact:

The IBC currently requires certain exterior wall assemblies containing MCM and HPL systems to be tested to, and comply with, NFPA 285. This change proposal clarifies the proper application of NFPA 285 to those exterior wall assemblies.

FS117-24

IBC: 2603.1.1, IAPMO/ANSI (New)

Proponents: Justin Davis, Self

2024 International Building Code

Revise 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 either ICC 1100 or IAPMO/ANSI ES1000.

Add new text as follows:

IAPMO/ANSI ES. 1000-2020- Building Code Compliance Spray-Applied Polyurethane Foam

Staff Analysis: A review of the standard proposed for inclusion in the code, IAPMO/ANSI ES. 1000-2020 Building Code Compliance Spray-Applied Polyurethane Foam, with regard to some of the key ICC criteria for referenced standards (Section 4.6 of CP#28) will be posted on the ICC website on or before March 18, 2024.

Reason: To allow the use of an additional active consensus standard for use showing compliance with the International Building Code. Historically, the codes have included multiple standards that have been used to show compliance. IAPMO/ANSI ES1000 is in the process of being updated at this time.

Cost Impact: The change proposal is editorial in nature or a clarification and has no cost impact on the cost of construction

Justification for no cost impact:

The new standard is an option to what is already in place in the code.

FS118-24

IBC: 2603.3

Proponents: Mike Fischer, Kellen, The Extruded Polystyrene Foam Association (mfischer@kellencompany.com)

2024 International Building Code

Revise as follows:

2603.3 Surface-burning characteristics.
Unless otherwise indicated in this section, *foam plastic insulation* and foam plastic cores of manufactured assemblies shall have a *flame spread index* of not more than 75 and a *smoke-developed index* of not more than 450 where tested in the maximum thickness intended for use in accordance with ASTM E84 or UL 723. Loose fill-type *foam plastic insulation* shall be tested as board stock for the *flame spread* and smoke-developed indices.

Exceptions:

1. *Smoke-developed index* for interior *trim* as provided for in Section 2604.2.
2. In cold storage *buildings*, ice plants, food plants, food processing rooms and similar areas, *foam plastic insulation* where tested in a thickness of 4 inches (102 mm) shall be permitted in a thickness up to 10 inches (254 mm) where the *building* is equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1. The *approved automatic sprinkler system* shall be provided in both the room and that part of the *building* in which the room is located.
3. *Foam plastic insulation* where tested at a thickness of 4 inches (102 mm) with a maximum *flame spread index* of 75 shall be permitted in a thickness not less than 4 inches (102 mm) as part of a Class A, B or C roof-covering assembly. The *smoke-developed index* shall not be limited.
4. *Foam plastic insulation* that is a part of a Class A, B or C roof-covering assembly provided that the assembly with the *foam plastic insulation* satisfactorily passes NFPA 276 or UL 1256. The *smoke-developed index* shall not be limited for roof applications.
5. *Foam plastic insulation* greater than 4 inches (102 mm) in thickness shall have a maximum *flame spread index* of 75 and a *smoke-developed index* of 450 where tested at a minimum thickness of 4 inches (102 mm), provided that the end use is *approved* in accordance with Section 2603.9 using the maximum thickness and density intended for use.
6. *Flame spread* and smoke-developed indices for foam plastic interior signs in *covered and open mall buildings* provided that the signs comply with Section 402.6.4.

Reason: New energy code minimum roof R-value requirements commonly require a thickness of 4 inches or greater for foam plastic insulation. Testing foam plastic flame spread on thicknesses greater than 4 inches is challenging, given the limitations of the flame spread test equipment. Therefore, the IBC needs a new Section 2603.3 Exception to allow flame spread testing at a 4 inch thickness and permit the test results to apply to foam plastic insulation greater than 4 inches in roof applications. There is precedence for this approach as shown in Exception 2 for cold storage buildings and Exception 4 for interior applications.

The smoke-developed index is not limited in the new Exception 3, similar to the former Exception 3.

Cost Impact: The change proposal is editorial in nature or a clarification and has no cost impact on the cost of construction

Justification for no cost impact:

This code change proposal reflects current practice and code provisions and as such, will neither increase or decrease the cost of construction.

FS119-24

IBC: 2603.3

Proponents: Mike Fischer, Kellen, The Extruded Polystyrene Foam Association (mfischer@kellencompany.com)

2024 International Building Code

Revise as follows:

2603.3 Surface-burning characteristics.
Unless otherwise indicated in this section, *foam plastic insulation* and foam plastic cores of manufactured assemblies shall have a *flame spread index* of not more than 75 and a *smoke-developed index* of not more than 450 where tested in the maximum thickness intended for use in accordance with ASTM E84 or UL 723. Loose fill-type *foam plastic insulation* shall be tested as board stock for the *flame spread* and smoke-developed indices.

Exceptions:

1. *Smoke-developed index* for interior *trim* as provided for in Section 2604.2.
2. In cold storage *buildings*, ice plants, food plants, food processing rooms and similar areas, *foam plastic insulation* where tested in a thickness of 4 inches (102 mm) shall be permitted in a thickness up to 10 inches (254 mm) where the *building* is equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1. The *approved automatic sprinkler system* shall be provided in both the room and that part of the *building* in which the room is located.
3. *Foam plastic insulation* that is a part of a Class A, B or C roof-covering assembly provided that the assembly with the *foam plastic insulation* satisfactorily passes NFPA 276 or UL 1256. ~~The *smoke-developed index* shall not be limited for roof applications.~~
4. The *smoke-developed index* of *foam plastic insulation* shall not be limited for applications that are part of Class A, B or C roof-covering assemblies.
5. ~~4.~~ *Foam plastic insulation* greater than 4 inches (102 mm) in thickness shall have a maximum *flame spread index* of 75 and a *smoke-developed index* of 450 where tested at a minimum thickness of 4 inches (102 mm), provided that the end use is *approved* in accordance with Section 2603.9 using the maximum thickness and density intended for use.
6. ~~5.~~ *Flame spread* and smoke-developed indices for foam plastic interior signs in *covered and open mall buildings* provided that the signs comply with Section 402.6.4.

Reason: The smoke-developed index (SDI) exception is moved from the existing Exception 3 to a separate Exception 4 for clarity. This change will improve the language and facilitate code education efforts.

Exception 3 currently implies that both the flame spread and smoke-developed index thresholds are not limited for foam plastic insulation when both the roof covering is classified (Class A, B or C) and the roof assembly passes the NFPA 276 or UL 1256 requirement. The sentence "The smoke-developed index shall not be limited for roof applications" is redundant.

Exception 4 is created to clarify that flame spread is limited, but smoke-developed index is not limited for roof classification only.

Without this proposed language, one might be confused about the FS/SDI requirements foam plastic insulation in Section 2603.4.1.5.

The method of construction listed in item 1 for a wood structural panel deck limits flame spread, but not smoke-developed index for the foam plastic insulation per Section 2603.3, new Exception 4.

Item 2 limits neither flame spread, nor smoke-developed index for the foam plastic insulation per Section 2603.3, existing Exception 3.

Cost Impact: The change proposal is editorial in nature or a clarification and has no cost impact on the cost of construction

Justification for no cost impact:

This clarification reflects current practice and code requirements and as such will neither increase or decrease the cost of construction.

FS120-24

IBC: 2603.4.1.5

Proponents: Mike Fischer, Kellen, The Extruded Polystyrene Foam Association (mfischer@kellencompany.com)

2024 International Building Code

Revise as follows:

2603.4.1.5 Roofing.
A thermal barrier is not required for above-deck *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 2, or tested as described in Item ~~2~~ 3.

1. The roof assembly is separated from the interior of the *building* by *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. Where the foam plastic insulation is separated from the interior of the building by a concrete or composite metal and concrete roof deck in accordance with Section 1508.1, Exception 2.
3. ~~2~~ 3. The assembly with the *foam plastic insulation* satisfactorily passes NFPA 276 or UL 1256.

Reason: There has been confusion about the interpretation of roofing requirements for thermal barriers over foam plastic insulation due to the scattered nature of roofing requirements across Chapters 15 and 26.

Chapter 15 Roofing requirements.

Section 1505.1 requires Class A, B, C roof covering classification (ASTM E108 or UL 790).

Section 1508.1 for roof insulation requires roof assembly testing per UL 1256 or NFPA 276 with use of above-deck thermal insulation. Exception 1 is for foam plastic insulation in Chapter 26 and Exception 2 is for concrete or metal/concrete roof decks with an approved roof covering.

Chapter 26 Roofing requirements for foam plastic insulation thermal barrier.

Section 2603.4 requires a thermal barrier for Class A, B, or C roof-covering assemblies that are not tested in accordance with UL 1256 or NFPA 276.

In Section 2603.4.1.5, the two, Class A, B, or C roof-covering assemblies that are not required to have a thermal barrier are:

1) roof assemblies separated from the interior by wood structural panels and

2) roof assemblies that pass UL 1256 or NFPA 276.

Looking at both Chapter 15 and 26, the two roof decks that do not require UL 1256 or NFPA 276 are wood structural panels per Section 2603.4.1.5, Exception 1 and concrete or metal/concrete roof decks per Section 1508.1, Item 2.

This connects the requirements in Section 1508.1, Exception 2 with the thermal barrier not required in Section 2603.4.1.5. Without the proposed language, one could be confused whether or not a thermal barrier is required between the foam plastic and concrete or metal/concrete roof decks. The language also clarifies that the requirement applies to above-deck foam plastic insulation.

Cost Impact: The change proposal is editorial in nature or a clarification and has no cost impact on the cost of construction

Justification for no cost impact:

This clarification reflects current practice and code requirements and as such will neither increase or decrease the cost of construction.

FS121-24

IBC: 2603.9

Proponents: Eric Banks, e.w.banks consulting llc, North American Modern Building Alliance (NAMBA) (eric.banks@ewbanksconsulting.com)

2024 International Building Code

Revise as follows:

2603.9 Special approval.
Foam plastic and assemblies containing foam plastic shall not be required to comply with the requirements of Section 2603.4 or those of Section 2603.6 where specifically *approved* based on one of the following large-scale tests:

1. NFPA 286 using the acceptance criteria of Section 803.1.1.1.
2. Room Test of FM 4880.
3. ~~UL 1040.~~
4. ~~4~~3. UL 1715.

Such testing shall be performed on the finished manufactured foam plastic assembly in the maximum thickness intended for use. Foam plastics that are used as *interior finish* on the basis of these tests shall also conform to the *flame spread* and smoke-developed requirements of Chapter 8. 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: The proposed change brings the approved test methods of 2603.9 Special Approval in-line with the Integrity Fire Tests (Part II) of NFPA 275 *Standard Method of Fire Tests for the Evaluation of Thermal Barriers*. NFPA 275 is a performance testing option referenced in the requirements of Section 2603.4 Thermal barrier. Section 2603.9 Special approval provides another performance test option to permit the use of foam plastic insulation without the thermal barrier required in Section 2603.4 by demonstrating equivalent performance – i.e., no flashover for a period of at least 15-minutes.

The FM 4880 approval standard contains four (4) different large-scale fire tests (Room Test, 16-ft High Parallel Panel Test, 25-ft High Corner Test, and 50-ft High Corner Test) and a series of performance ratings defined by insulation type, facer type, and a prescribed series of tests. It is understood that the 25-ft and 50-ft High Corner Tests have not been performed on foam plastic panels / assemblies for many years, in part due to the availability of the Room Test option provided in FM 4880.

The NFPA 275 Standard Method of Fire Tests for the Evaluation of Thermal Barriers, referenced in Section 2603.4, also generically referenced FM 4880 among the approved test methods for the Integrity Fire Tests (Part II) of the evaluation. The 2022 Edition of NFPA 275, however, was revised to was more clearly and specifically reference the Room Test of FM 4880.

The UL 1040 is also a very large-scale test, using a 20-ft by 20-ft by 30-ft high open-corner configuration, a 764-pound wood crib ignition source and a 30-minute test duration. This test has also not been performed in many years due, to its size, associated cost, and the availability of NFPA 286 and UL 1715 . The NFPA 275 Standard Method of Fire Tests for the Evaluation of Thermal Barriers, referenced in Section 2603.4, referenced UL 1040 among the approved test methods for the Integrity Fire Tests (Part II), however, it was removed from the 2022 Edition of NFPA 275.

The changes will improve the consistency of the evaluations performed under Section 2603.9 and its intent in terms of the Special Approval in reference to Section 2603.4.

Cost Impact: The change proposal is editorial in nature or a clarification and has no cost impact on the cost of construction

Justification for no cost impact:

The proposed code change provides clarification regarding the existing tests required for compliance with Section 2603.9.

FS122-24

IBC: 2603.9

Proponents: Eric Banks, e.w.banks consulting llc, North American Modern Building Alliance (NAMBA)
(eric.banks@ewbanksconsulting.com)

2024 International Building Code

Revise as follows:

2603.9 Special approval.
Foam plastic shall not be required to comply with the requirements of Section 2603.4 ~~or those of Section 2603.6~~ where specifically *approved* based on one of the following large-scale tests:

1. NFPA 286 using the acceptance criteria of Section 803.1.1.1.
2. FM 4880.
3. UL 1040.
4. UL 1715.

Such testing shall be performed on the finished manufactured foam plastic assembly in the maximum thickness intended for use. Foam plastics that are used as *interior finish* on the basis of these tests shall also conform to the *flame spread* and smoke-developed requirements of Chapter 8. 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: Section 2603.9 was revised last cycle (F60-21, Part II) to limit *Special approval* of foam plastic insulation to four (4) referenced standard tests – essentially a narrowing of the scope. One consequence of F60-21, Part II is that Section 2603.9 would potentially permit the use of foam plastic insulation in roof coverings and roof assemblies on the basis of testing that is not designed or intended to assess roofing applications. The four (4) test methods to which Section 2603.9 is now limited (NFPA 286, FM 4880, UL 1040, and UL 1715) are intended for the assessment of insulated wall constructions, insulated wall / wall panel assemblies, and interior finish materials & assemblies.

Section 2603.6 is included below for convenience:

> **2603.6 Roofing.** Foam plastic insulation meeting the requirements of Sections 2603.2, 2603.3 and 2603.4 shall be permitted as part of a roof-covering assembly, provided that the assembly with the foam plastic insulation is a Class A, B or C roofing assembly where tested in accordance with ASTM E108 or UL 790.

The changes to Section 2603.9 have resulted in 2024 IBC language that now provides the potential to obtain approval for use in a roof-covering where an exterior fire exposure test is required (ASTM E108 / UL 790) on the basis of testing that is of an interior fire exposure (NFPA 286, UL 1715, et al) and potentially in conflict with Fire Classification requirements of Section 1505. This proposal will clarify the narrowed scope of Section 2603.9 resulting from the narrowed scope and the limitations of the referenced tests.

Cost Impact: The change proposal is editorial in nature or a clarification and has no cost impact on the cost of construction

Justification for no cost impact:

The proposed code change is a clarification of the use of existing requirements under Section 2603.9.

FS123-24

IBC: [BF] 2612.3, ASTM Chapter 35 (New)

Proponents: Marcelo Hirschler, GBH International, GBH International (mmh@gbhint.com)

2024 International Building Code

Revise as follows:

[BF] 2612.3 Flame spread index.

Plastic composite deck boards, *stair* treads, *handrails* and *guards* shall exhibit a *flame spread index* not exceeding 200 when tested in accordance with ASTM E84 or UL 723 with the test specimen remaining in place during the test. Specimen preparation and mounting shall be in accordance with ASTM E3202.

Exception: Materials determined to be noncombustible in accordance with Section 703.3.

Add new standard(s) as follows:

ASTM

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

E3202	Standard Practice for Specimen Preparation and Mounting of Plastic Composites for Use as Deck Boards, Stair Treads, Guards or Handrails to Assess Surface Burning Characteristics (2024)

Staff Analysis: A review of the standard proposed for inclusion in the code, ASTM E3202 Standard Practice for Specimen Preparation and Mounting of Plastic Composites for Use as Deck Boards, Stair Treads, Guards or Handrails to Assess Surface Burning Characteristics (2024), with regard to some of the key ICC criteria for referenced standards (Section 4.6 of CP#28) will be posted on the ICC website on or before March 18, 2024.

Reason: Whenever an explicit standard practice for specimen preparation and mounting of ASTM E84 has been developed by ASTM it has been incorporated into the IBC. ASTM E3202 has recently been developed. Such references are included in Chapter 8 (ASTM E2404, ASTM E2573, ASTM E2579), chapter 14 (ASTM E2404), chapter 26 (ASTM E2599), and the IMC (ASTM E2231). This ensures the labs use the proper standardized procedure.

Cost Impact: The change proposal is editorial in nature or a clarification and has no cost impact on the cost of construction

Justification for no cost impact:

This is consistent with the references to ASTM E84 mounting methods in other chapters of the IBC and IMC and does not add requirements but provides guidance.